Office for National Statistics

Article

# Sub-regional public sector finances: Scoping study

The study details and evaluates methodologies and data sources currently used to estimate public sector revenue/expenditure at sub-regional level.

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# 1 . Executive summary

This sub-regional scoping study details data sources and methods that have been used or might be used to estimate overall public sector expenditure and revenues for sub-regional geographies, such as local authority districts. Subtracting overall revenue from overall expenditure within a given geographical area reveals a net fiscal balance, which broadly indicates whether the relevant area adds to or reduces the budget deficit or surplus at national level.

In 2016, the Office for National Statistics (ONS) conducted a consultation to gauge levels of interest in an ONS publication that would show net fiscal balances for Wales, Northern Ireland, Scotland and the nine English regions. Responses to the consultation confirmed that there is an appetite on behalf of users of public sector finances data for estimates of fiscal balances at country or regional level. We committed to produce an annual Country and Regional Public Sector Finances bulletin, and the first of these bulletins was published as Experimental Statistics on 23 May 2017.

Some responses to the 2016 consultation suggested that there might also be significant interest in estimates of net fiscal balance for sub-regional geographies. In part such interest is likely to have been spurred by initiatives such as the formation of local enterprise partnerships (LEPs), and combined authorities. In the light of those responses we decided to produce this sub-regional scoping study.

The scoping study has established that certain elements within overall public sector revenues and expenditure are published, or are otherwise available, at local authority district level, and can be aggregated to provide estimates at other levels, such as LEPs or city regions. These elements are generally sourced from administrative records. On the expenditure side elements that are identifiable at this geography include current and capital expenditure by local authorities, together with social protection benefit payments made by Department for Work and Pensions (DWP) and HM Revenue and Customs (HMRC).

On the revenue side, details of receipts from Council Tax and Non-Domestic Rates are available at local authority district level. The tax which raises more public sector revenue than any another is Personal Income Tax (PIT). HMRC estimates of PIT receipts are available at local authority district level on a residence basis (i.e. based on where payees reside rather than where they may be employed). These estimates of PIT receipts are statistically robust for large cities and agglomerations such as combined authorities. However, robustness declines directly with population, such that for smaller local authority districts, margins of error associated with such estimates render them unreliable.

In terms of monetary values, less than half of total public sector expenditure is currently identifiable at local authority district level, and for public sector receipts the corresponding fraction is much smaller still. In order to allocate non-identifiable expenditure or revenue items to districts, these have to be apportioned using one or more available indicator sets. Identifying and applying indicators that will produce robust estimates at this level is in many instances extremely challenging. This is the case in all countries within the UK, but is particularly so for Northern Ireland where data sources are more limited.

Several think-tanks, including Centre for Cities and New Economy, have carried out innovative research, and calculated PSF estimates, including fiscal balances, for a range of geographies, including LEPs and city-regions. However, their inevitable extensive reliance on apportionment means that users of such estimates, particularly those relating to net fiscal balances for small and medium-sized local authority districts, should treat them with a degree of caution.

Provisions within the Digital Economy Act 2017, enabling ONS to access a broader array of administrative data from public bodies, may over time reduce our reliance on survey data, and help in improving the quality of public sector finance statistics for sub-regional geographies.

## 2 . Aims and scope of study

While it is targeted primarily at analysts and expert users, this scoping study is also intended to be accessible to inquiring citizens. Hence it does not assume any detailed knowledge or understanding of the public sector finances (PSF) on the part of readers. An explanation or definition of each term within the body of the study is provided in the glossary.

The study aims to provide a brief introduction to some of the key PSF concepts and aggregates, explaining what they represent, and why they matter at national level. It also relates the PSF to some of the key metrics used to measure economic performance, such as gross domestic product and gross value added (GDP and GVA).

The study also seeks to acquaint readers with the changing roles and responsibilities of the devolved administrations, and local authorities throughout the UK. It documents the emergence of relatively new players that have, in accordance with the UK government's devolution agenda, emerged at sub-country or regional level, such as local enterprise partnerships and combined authorities.

The intention has been for this study to complement rather than duplicate the Country and Regional Public Sector Finances: Scoping Study (CRPSFSS) that was published in 2016, but certain important issues, concepts, and sources detailed in the CRPSFSS are also necessarily included in this study.

This study focuses primarily on methods and data sources that have been, or might be, used to produce estimates of net fiscal balance at local authority level. Such estimates could then be used as building blocks to produce corresponding estimates at other geographies such as local enterprise partnerships, combined authorities, or city regions.

The study details the rationale, approaches, data sources, and methodologies employed by several organisations that have produced such estimates, including Centre for Cities and New Economy.

The scoping study is being published alongside a consultation, which will improve our understanding of the interest in, and uses of, sub-regional public sector revenue and expenditure estimates. Together, they will assist us in reaching informed decisions regarding the desirability and feasibility of our involvement in the production and publication of such estimates.

## 3 . Introduction: public sector finances, main concepts, measures and publications, and why it matters

In February 2016, the Office for National Statistics (ONS) published the Country and Regional Public Sector Finances: Scoping Study (CRPSFSS). This described a set of main publications that provide detailed information concerning the public sector finances (PSF) either at aggregate UK level, or at sub-UK level. Amongst the former are the PSF monthly bulletin, and the quarterly EU government deficit and debt return, which provide complementary information on the fiscal position of the UK at an aggregate level. ONS is solely responsible for publishing the deficit and debt return, while the bulletin is a joint publication with HM Treasury.

In compiling the deficit and debt return ONS must follow principles and practices set out in the European System of Accounts 2010: ESA 2010, and the Manual on Government Deficit and Debt (MGDD). This ensures that all member states of the European Union (EU) submit data on a comparable basis. The UK public sector finances are also produced in accordance with the international guidance set out in ESA 2010 and associated manuals.

The ONS annual Blue Book publication gives a detailed summary of the overall performance of the economy and individual sectors, with the headline figure being UK gross domestic product (GDP). As GDP is a measure of output sold at market prices, it reflects the impacts of any taxes on products or subsidies for production that may have been introduced by government. Gross value added (GVA) is a measure of the monetary value of output with any impacts of taxes or subsidies on products removed.

In order to measure their contributions to the overall economy, ONS produces estimates of GVA not only at an aggregate level, but also for individual industries, sectors, regions and sub-regions within the UK.

For analytical purposes, including the compilation of GDP, all individuals and institutions that function within an economy are allocated to institutional sectors. These include: general government, which can be separated into central and local government; and corporations (businesses), with those that are owned and/or controlled by government being categorised more specifically as public corporations.

While the deficit and debt return focuses on the finances of general government, the monthly PSF bulletin not only provides data on the financial transactions and position of general government, but also on the wider public sector, including public corporations. In the UK, decisions on whether a government-controlled entity should be classified to the central or local government sector, or alternatively as a public corporation, are taken by ONS through the work of the Economic Statistics Classification Committee (ESCC), and recorded in the Public Sector Classifications Guide.

The PSF bulletin delivers several headline statistics, together with a range of supplementary charts and tables. The headline statistics focus principally on public sector net borrowing (PSNB), and public sector net debt (PSND), and variations on these. If public sector current expenditure (that is, expenditure on wages, consumables or overheads) exceeds public sector revenue, there is a current budget deficit. And if public sector current expenditure plus net investment (that is, capital expenditure less the sum of any capital receipts and less depreciation or consumption of capital) exceeds public sector revenue, this results in public sector net borrowing.

Net borrowing impacts negatively over time on the level of PSND, that is, more borrowing leads, all else being equal, to higher levels of debt. There are two major differences between PSND and the measure of debt reported in the EU government deficit and debt return. PSND is a broader measure in that it includes the debts of public corporations in addition to general government debt. But whereas the debt measure shown in the deficit and debt return is a gross figure, the calculation of PSND involves subtracting the value of any liquid assets, such as cash held in bank accounts, from the gross level of public sector debt.

The Chancellor of the Exchequer is responsible for UK fiscal policy (that is, for raising revenue via taxation or other means, and for controlling public expenditure). The Chancellor has overall responsibility for Her Majesty's Treasury (HMT), and sets out the main elements of the government's fiscal policy in the annual Budget statement. Within the budgetary statements, the Chancellor outlines to Parliament and the nation the expected impacts that any new measures will have on headline indicators, such as PSNB and PSND, according to forecasts produced by the independent Office for Budget Responsibility (OBR).

While it is not unusual for government finances to be in deficit, especially when growth in the economy (as measured by GDP) is weak or non-existent, it is generally accepted that running substantial deficits for government and the public sector persistently over an extended number of years is undesirable. Given that reserves are limited, this will eventually necessitate additional borrowing that could raise sovereign debt to levels that are difficult to sustain.

Credit rating agencies may react to the publication of unfavourable government (or public sector) finance data by downgrading that government's credit rating or score. These ratings affect the cost of borrowing in financial markets. An inferior rating generally means that higher rates of interest have to be offered to persuade potential buyers to purchase government bonds.

Other official releases provide additional information and estimates relating to the PSF. For anyone interested in the main expenditure side of PSF at sub-UK level a main HMT publication is the Country and Regional Analysis (CRA), which is usually published in November.

The primary source of most data relating to public sector revenue is Her Majesty's Revenue and Customs (HMRC), which collects the majority of taxes on behalf of central government and the devolved administrations. NonDomestic Rates (NDR), which are often referred to as business rates, and Council Tax are collected by local councils, who supply relevant data to the Department for Communities and Local Government (DCLG) or the devolved administrations. Other taxes that produce sizeable amounts of revenue but are not collected by HMRC include Vehicle Excise Duty and TV licence fees.

HMRC's A disaggregation of HMRC tax receipts (DOTR) publication provides estimates at country level of revenues generated by each tax that it collects, that is, it shows separate estimates of receipts allocated to England, Northern Ireland, Scotland, and Wales respectively. The receipts recorded in the DOTR are on a cash basis, so adjustments are necessary to convert the data to an accruals basis and achieve consistency with ESA 2010 requirements and the PSF.

Further information on the CRA and DOTR is provided both within the CRPSFSS and section 6 of this sub-regional scoping study.

The Country and Regional Public Sector Finances: Scoping Study (CRPSFSS) published in 2016 provides summary information on the content, coverage (both geographically and in terms of sectors), underlying accounting basis and frequency of publication of outputs related to the public sector finances at UK and Nomenclature of Territorial Units for Statistics: NUTS1 level.

The Country and Regional Public Sector Finances statistical bulletin was published for the first time in May 2017 and is intended to be an annual publication. It provides comprehensive estimates of public sector expenditure and receipts and net fiscal balances for all of the NUTS1 regions of the UK (that is, the nine English regions, Northern Ireland, Scotland and Wales). These estimates are currently badged as Experimental Statistics.

## 4 . Devolution in the UK: the devolved administrations of Northern Ireland, Scotland, Wales, and Greater London; devolution within England

In the UK, devolution generally refers to the statutory granting of powers from the Parliament of the UK at Westminster to the Scottish Parliament, the National Assembly for Wales, the Northern Ireland Assembly, and the London Assembly; and to their associated executive bodies, the Scottish Government, the Welsh Government , the Northern Ireland Executive (NIE), and in England, the Greater London Authority. More recently the concept of devolution has broadened to encompass agreements providing for the delegation of certain powers and the provision of associated funding to certain combined authorities (CAs), such as Greater Manchester CA.

The powers and areas of competence that have been delegated to the devolved administrations vary from one country to another and are gradually being extended. They include the ability to introduce certain new taxes and vary existing taxes. In Scotland UK Stamp Duty Land Tax and Landfill Tax have been replaced by Land and Buildings Transaction Tax and Scottish Landfill Tax. The Scotland Act 2012 allows the Scottish Parliament to set the Scottish rate of Income Tax (SRIT), which came into effect from 6 April 2016.

In April 2018, Stamp Duty Land Tax and Landfill Tax will be replaced in Wales by Land Transaction Tax and Landfill Disposals Tax. From April 2019, income tax will be partially devolved to Wales, and Northern Ireland will be setting its own rate for Corporation Tax, which may enable it to compete more effectively with the Republic of Ireland to attract inward foreign direct investment.

Certain policy areas remain "reserved" for the UK government and Parliament, which retain direct control of most tax-raising powers and expenditure. Both revenue and capital expenditure undertaken by the devolved administrations, are currently financed for the most part by block grants, provided by the UK government. The Barnett formula is used to determine annual changes in the block grant, giving each country the same pounds-per-person change in funding as comparable services in England.

The Greater London Authority (GLA) comprises a directly elected executive Mayor of London, plus an elected 25-member London Assembly with scrutiny powers. It is a strategic regional authority, with powers over transport, policing, economic development, and fire and emergency planning. Four functional bodies — Transport for London, the Mayor's Office for Policing and Crime, London Fire and Emergency Planning Authority, and GLA Land and Property — are responsible for delivery of services in these areas. The GLA is mostly funded by direct government grant but is also a precepting authority, with some of its revenue sourced from a precept on Council Tax collected by individual London boroughs.

In each Nomenclature of Territorial Units for Statistics: NUTS1 region within England, aside from Greater London, a Regional Development Agency (RDA) had been established in 1998, primarily for the purpose of promoting regional economic development. (Information on NUTS and other statistical geographies is provided in Annex 1 of this scoping study.) In 2010, it was announced that the RDAs would be abolished in 2012. The only exception was the Greater London Authority, which continues to operate.

From 2012, responsibility for economic development at local level was transferred by the Coalition Government to local authorities, and local enterprise partnerships (LEPs). LEPs are partnerships between local authorities and the private sector. They are intended to shape local economic priorities and undertake activities to promote economic growth and create jobs. There are 39 LEPs, and every local authority in England belongs to at least one LEP.

In 2014, the government announced that it had agreed Growth Deals with each of the 39 LEPs, through which it indicatively allocated £6.3 billion from the Local Growth Fund. Each LEP's Growth Deal was awarded based on the perceived strength of its multi-year strategic economic plan. According to the National Audit Office, "the Government regards LEPs as essential to its progressing English devolution agenda".

A significant development in recent years has been the emergence of combined authorities, created via legislation in the UK Parliament. A combined authority is a statutory form of collective decision-making between two or more local councils, which seeks to improve the delivery of public services and other public functions across their area combined geographies. While combined authorities are led by councillors, the chair of any LEP operating at least partly within a combined authority is also likely to be invited to become a member.

Combined authorities typically have responsibility for transport, economic development and regeneration, and this may be extended to other fields. The Greater Manchester Combined Authority currently has the widest range of additional functions, including health and social care, children's services and public health.

The UK government has invited combined authorities to submit proposals for the devolution of selected powers from central government to combined authorities. It announced the first confirmed devolution deal with Greater Manchester in November 2014, and this has been followed by a number of others. All deals confirmed to date include an agreement on devolved responsibility for substantial aspects of transport, business support, and further education. Other policy areas encompassed in some deals include housing and planning, employment support, and health and social care.

All combined authorities will have the power to borrow money under the local government prudential borrowing regime, but the order establishing the authority must specify the purposes for which money may be borrowed. Typically, devolution deals have included the retention of local business rate growth above an agreed threshold. Some devolution deals also include additional devolved resources including an investment fund.

The government has announced the piloting of 100% retention of business rates revenue in four combined authorities: Greater Manchester, the Liverpool City Region, the West Midlands, and Cornwall. This is intended to help authorities to build financial capacity to reform core services and invest in long-term economic growth.

Combined authorities, or their equivalents, have also been designated in Scotland and Wales. Devolution deals have been announced for some of these, namely the Glasgow City Region and the Cardiff City Region. Funding in these cases is being provided jointly by the UK government and the devolved administrations.

# 5 . The structure and finances of local government in the countries of the UK

The structure and responsibilities of local government within the UK have evolved over many decades and continue to do so. The territories of each of the countries of the UK are sub-divided and allocated to local authorities (LAs), which are granted powers by central government (including the devolved administrations, as local government is a devolved responsibility in Scotland, Wales and Northern Ireland).

Local authorities are run by elected councils and are endowed with a range of powers and duties, including:

- mandatory duties – such as providing schooling for 5 to 16 year olds, and accommodation for the homeless
- permissive powers – such as providing recreation services
- regulatory powers – such as trading standards, environmental health and licensing of taxis

Two broad categories of expenditure are measured in the public sector finances. These are current or revenue expenditure and capital expenditure. Current expenditure equals the costs of providing day-to-day services and consists primarily of employee costs and other operating costs. Net current expenditure is total (gross) local authority expenditure on services, less any specific income for individual services, such as fees for parking or the issuing of licences for taxis or public houses.

Net revenue expenditure is related to, but is not synonymous with net current expenditure. Its definition varies slightly between countries given the different grants available from central to local government in each country. Generally it includes the costs of financing capital expenditure (that is, interest on loans taken out to finance capital expenditure), but excludes current expenditure financed by special or specific grants.

Capital expenditure is investment spending on fixed assets such as care homes, schools, or roads, which will provide benefits over a number of years. This is largely financed via grants from central government. Local authorities can supplement this funding by taking out commercial loans, but must adhere to the Chartered Institute of Public Finance and Accountancy (CIPFA) Prudential Code. This requires that capital expenditure and associated borrowing by local authorities must be affordable, prudent and sustainable.

When capital expenditure is financed by borrowing, or via a credit arrangement (such as a finance lease, a Public-Private Partnership (PPP), or a Private Finance Initiative (PFI)) a debt liability is created to be repaid by a local authority from future revenues.

In compiling the public sector finances at UK level it is important to avoid double-counting. Thus grants provided by central to local government need to be netted off such that they do not appear as both expenditure by central government and expenditure by local government.

There are two forms of local taxation that local authorities collect, Council Tax, and Non-Domestic Rates (NDR), commonly referred to as business rates. Northern Ireland does not have Council Tax but has a broadly equivalent local tax known as domestic rates. Local authorities retain the Council Tax that they collect although some of this may be passed on to other authorities, known as precepting authorities.

The structure of local government varies across the UK.

## Scotland

In Scotland, there are 32 local council unitary authorities, covering the entire Scottish mainland, plus the Shetlands, Orkneys, and Eilean Siar (the Western Isles).

Councils may choose to work collaboratively with other public bodies, including other councils to deliver services via joint boards or committees. There are currently 18 such boards, which are regarded as local authorities in their own right. In certain cases councils are mandated by law to work with other public bodies to deliver integrated services. Since 2003, they have been required to work in partnership with agencies such as health boards, enterprise, police, and fire and rescue services.

Prior to the creation of the Scottish Police Services Authority and the Scottish Fire and Rescue Service on 1 April 2013, police and fire services were funded through the local government settlement, but they are now financed separately as single purpose authorities. The Public Bodies (Joint Working) (Scotland) Act 2014 requires NHS Boards and local authorities to work together to deliver integrated health and social care services through Health and Social Care Partnerships.

Net revenue expenditure is financed by grants from the Scottish Government, NDR receipts, Council Tax receipts, and local authority reserves. The total NDR income initially collected by local authorities is pooled at the Scotland level, and then redistributed to local authorities. A Business Rates Incentivisation Scheme (BRIS) was introduced from April 2012 to encourage councils to maximise existing business rates income and attract new businesses. BRIS allows all authorities that exceed their annual business rates collection target to retain 50% of any additional income.

The Scottish Government publishes details of local government finances on an annual basis in its Scottish Local Government Finance Statistics publication and related datasets. In addition to national totals, certain data on local taxes and expenditure are provided for all individual authorities. Revenue expenditure (both gross and net) and capital expenditure are disaggregated into 10 broad service categories: education, social work, road and transport, environmental services, planning and development, cultural and recreational, non-HRA housing, central services, trading services, and the Housing Revenue Account (HRA).

Within the 10 broad categories, more granular data are provided. For example, expenditure on education services is disaggregated into expenditure on pre-primary, primary, and secondary education.

To provide a more complete picture, the Scottish Government not only provides data showing expenditure and income relating exclusively to each council. If a joint board also provides services within a local council area, a percentage of its expenditure is apportioned to that area, and an expenditure figure including the apportioned amount is also provided. Thus for 2014 to 2015 the City of Aberdeen’s net revenue expenditure on its own account was £369.48 million. Two joint boards, Grampian Valuation Joint Board and NESTRANS, provide services within Aberdeen and when elements of their expenditure are apportioned to Aberdeen, a slightly higher net revenue expenditure of £369.49 million is obtained.

For all Scottish local authorities in 2015 to 2016: gross revenue expenditure totalled £15.3 billion, net revenue expenditure was £10.1 billion, and total capital expenditure was £2.5 billion.

Total income from Council Tax for 2015 to 2016 was £2.1 billion, while £2.6 billion was collected in NDR.

## Wales

Since 1 April 1996, Wales has been divided into 22 local council authorities (LAs). These are usually described as unitary authorities or principal areas. The elected councils of these unitary authorities are responsible for the provision of virtually all local government services, including education, social work, environmental protection, and most highways within their boundaries.

For certain purposes, such as the provision of police and emergency services and the organisation of the National Health Service, Wales has been subdivided into areas comprising combinations of principal areas. For example, the Dyfed-Powys police force operates in an area consisting of Powys, Pembrokeshire, Ceredigion, and Carmarthenshire.

Stats Wales provides [financial data] for the 22 unitary authorities individually, plus a range of single purpose authorities comprising: the four police authorities, the three fire and rescue authorities, and the three national parks located within Wales.

For each of the 22 unitary authorities gross revenue expenditure is disaggregated into nine broad service categories: education; social services; council fund housing and housing benefit; local environmental services; road and transport; libraries, culture, heritage, sport and recreation; planning and economic development; Council Tax benefit and administration; other revenue expenditure. Gross and net current expenditure is provided at more granular service categories. For example, expenditure on education is split into expenditure on schools and non-school expenditure.

Gross revenue expenditure under the categories “law and order and protective services” and “other revenue expenditure” is provided for each police force and fire authority. For each national park expenditure is shown under the categories, “local environmental services” and “other revenue expenditure”. Stats Wales does not show separate estimates apportioning expenditure by these non-council local authorities to the unitary authorities in which they provide services.

Gross revenue expenditure for 2015 to 2016 totalled £7.0 billion for the 22 unitary authorities, £678 million for the police authorities, £148 million for the fire and rescue authorities, and £14 million for the three national parks. Combined capital expenditure for 2015- to 2016 totalled £2.0 billion for the 22 LAs, £38 million for the police authorities, £19 million for the fire and rescue authorities, and £1 million for the three national parks.

Unitary authorities in Wales are less diverse in terms of population size, and levels of revenue and expenditure than in Scotland, where the differences between the sparsely populated offshore unitary authorities and the major cities are more acute.

## Northern Ireland

The country is divided into 11 districts for local government purposes. This division was established on 1 April 2015, as a result of a reform process that started in 2005. Belfast is the most populous district with around 340,000 inhabitants, while the district of Fermanagh and Omagh has the smallest population with some 113,000 people. The previous pattern of local government, which encompassed 26 councils, had been established in 1973.

Local councils are not responsible for such an extensive range of functions as those in other parts of the UK. For example, they have no responsibility for education, road-building or housing (although they do nominate members to the advisory Northern Ireland Housing Council). Their functions include waste and recycling services, leisure and community services, building control, and local economic and cultural development. They are not planning authorities, but are consulted on some planning applications.

The collection of rates (broadly equivalent to Council Tax and NDR in the other countries of the UK) is handled by the Northern Ireland Land and Property Services agency. Its [Annual Report for 2015] to 2016 provides data on the total amounts of rates (that is, domestic and non-domestic combined) collected for each of the 26 councils that predated the 2015 reorganisation. In total £1.3 billion of rates was collected for 2015 to 2016.

The reform process of public administration in Northern Ireland also involved the following developments. There had been five education and library boards (ELBs) in Northern Ireland. The library functions of the ELBs were taken over by a new body, the Northern Ireland Library Authority, also known as Libraries NI, in April 2009. Subsequently, the education and skills functions were centralised into a single Education Authority for Northern Ireland in April 2015. While previously there had been four health and social services boards, these were replaced by a single Health and Social Care Board in April 2009.

Relatively little data relating to finances for individual local authorities is published in Northern Ireland. By referring to financial statements produced by individual district councils certain details relating to revenue and expenditure can be identified. Thus the Belfast City Council Financial Report for 2015 to 2016 includes details of the council's expenditure on a range of service areas, and sources of income.

## England

The structure of local government in England is more diverse than in the rest of the UK. English local authorities (LAs) may take any one of the following six possible forms:

- metropolitan districts
- London boroughs
- unitary authorities
- shire counties
- shire districts
- single purpose authorities

There are six metropolitan areas (Greater Manchester, Merseyside, South Yorkshire, Tyne and Wear, West Midlands, and West Yorkshire), in which most services provision is the responsibility of constituent metropolitan districts. Within Greater London, the London boroughs and the City of London deliver most of the functions, apart from those devolved to the Greater London Authority (GLA).

In terms of land area, much of England lies within so-called the shire areas. These are subject to two main tiers of local authorities, shire counties and shire districts, each endowed with their own designated powers and responsibilities. However, in certain parts of the country, a single unitary authority is responsible for providing the full range of services that would otherwise be provided by a combination of shire county and shire district. Fifty-six unitary authorities have been created in England since 1995.

Provision of fire and rescue, and passenger transport services is typically the responsibility of single purpose authorities, which usually share common boundaries. Other single purpose authorities include various national parks, and some waste disposal services. There is also a Police and Crime Commissioner for each constabulary covering a metropolitan area or shire county (or in some instances a combination of these).

Additionally, parishes and charter trustees represent a possible third tier of local government. Where these exist, they comprise the most localised level of government in England. They typically fund their activities by charging a precept that is added to each household's Council Tax bill. Given the limited nature of their powers and resources they are not generally regarded as LAs in themselves.

As in the rest of the UK, for administrative and analytical purposes, a distinction is made between revenue expenditure, and capital expenditure. The former is largely financed by a combination of central government grants, Council Tax, and retained NDR; and the latter by central government grants, capital receipts, or borrowing. Local authorities in England report details of their receipts and expenditure via outturn returns to the Department for Communities and Local Government (DCLG), which publishes summary details.

Only certain local authorities, known as billing authorities, collect Council Tax directly from households. Others receive funds indirectly, either by precepting on a billing authority, or by other channels, such as levies. In shire areas, county councils are precepting authorities, while district councils are the billing authorities. Police and fire and rescue authorities are also precepting authorities. Of the 444 LAs in England, 326 are billing authorities, that raise money directly via Council Tax, and 95 are major precepting authorities.

A business rate retention scheme was introduced in April 2013 and shares the same rationale as the BRIS in Scotland. Under the business rates retention scheme, authorities overall keep half of the local business rates (NDR) revenue, as well as the growth of their share. A system of tariffs and top-ups provided a one-off rebalancing of resources at the outset in order to ensure that no authorities suffered an initial sharp reduction in funding. Prior to this a system of pooling and redistribution to LAs by DCLG was in place.

In a speech at the Conservative Party conference on 5 October 2015, the then Chancellor committed to allowing local government to retain 100% of business rates revenue “by the end of the Parliament”. This was planned to begin in the financial year ending 2020, but its future is uncertain as the Local Government Finance Bill 2016 to 2017, which would have provided the statutory foundation for the change, fell as a result of the 2017 General Election.

Data published by DCLG indicate that total expenditure on services for all LAs in England, including single-purpose authorities such as police bodies, was around £90.6 billion in 2015 to 2016 The data are disaggregated by LA into the following 13 broad service categories: education; highways and transport; child social care; adult social care; public health; housing services (non-HRA); cultural and related; environmental and regulatory services; planning and development; central services; other services; police services; fire and rescue services.

Expenditure on policing and fire and rescue is zero for elected council LAs as these functions are the preserve of single-purpose police and fire authorities. Expenditure for district councils and single purpose LAs is also typically zero in the education, child social care, adult social care, and public health categories, as these are generally the preserve of shire counties. DCLG does not apportion expenditure by single-purpose authorities or shire counties to reflect the fact that residents of other local authorities may benefit from that expenditure.

Like their counterparts in Wales and Scotland, local authorities in England operate within a prudential capital finance system. This allows them to borrow to fund capital investment, provided that repaying the resulting debt is manageable, and will not impact adversely on an authority’s ability to deliver services.

Total capital expenditure for 2015 to 2016 was £20.7 billion, while capital receipts totalled £3.6 billion The latter comprises sales of tangible and intangible assets and repayments of grants. These totals are disaggregated by LA into the following 12 broad service categories: education; transport; social services; public health; housing; cultural and related; environmental; planning and development; central services (including court services); trading; police; fire and rescue. For some of these services more granular data is provided. For example, trading services are split between “industrial and commercial” and “other” sub-categories.

As with current or revenue expenditure, certain categories of capital expenditure are the preserve of single-purpose authorities or shire counties albeit the benefits of such expenditure may be enjoyed by residents of district or other local authorities. DCLG does not apportion such expenditure to reflect the fact that the benefits may be shared quite widely.

# 6 . PSF fiscal balance estimates at regional (NUTS 1) level

Trends towards increased devolution of fiscal powers both to the devolved administrations, including the Greater London Authority (GLA), and also to combined authorities (CAs) and individual councils has prompted increasing interest in data on public sector finances (PSF) at sub-UK levels.

This section identifies several publications that provide estimates of PSF revenues and expenditures and resulting fiscal balances for various Nomenclature of Territorial Units for Statistics: NUTS1 regions within the UK. For the production of regional expenditure estimates, these publications typically draw heavily on HM Treasury's (HMT's) annual Country and Regional Analysis (CRA) publication. As a source for deriving revenue estimates, an important annual publication is HM Revenue and Customs (HMRC's) A disaggregation of HMRC Tax Receipts (DOTR).

All the publications detailed in this section that present estimates of revenues from HMRC taxes utilise the same or similar sources of data and methodologies, to those used for the DOTR publication, although there are exceptions. All present estimates on a residence basis but GLA Economics also presents workplace-based estimates. The impacts that the differing approaches can have on estimates are illustrated in this section.

## Country and Regional Analysis (CRA) – an HM Treasury annual publication

The estimates of public spending provided in the CRA are calculated on the basis of HMT's total expenditure on services (TES) measure. TES is a measure of total current and capital expenditure by the public sector. While the compilation of TES is not entirely consistent with national accounting principles, TES is related to an alternative HMT measure of public sector expenditure, total managed expenditure (TME), which is consistent with national accounts principles and European System of Accounts: ESA 2010. TME is accordingly the primary measure of total public spending reported in the PSF bulletin. By making various accounting adjustments TES and TME can be reconciled.

The main difference between TES and TME is that TES does not include general government capital consumption (depreciation), and does not reverse the deduction of certain VAT refunds in the budget-based expenditure data. It also includes a small number of items that are included in budgets but not in TME. The most recent published estimates, provided in the 2016 CRA, show that for 2014 to 2015 TES was around £681.1 billion , while TME was circa £746.6 billion, a difference of some £65.5 billion. Of this difference, £42 billion was due to capital consumption and VAT refunds. TES has not yet incorporated the recent ONS reclassification of private registered providers of social housing in England, which accounts for a further £7 billion of the difference.

In order to inform the allocation of TES to individual countries and regions for its CRA publication, HMT asks all government departments and the devolved administrations to undertake an annual statistical exercise. The exercise is based on devolved administration spending and the subset of departmental spending that can be identified as benefiting the population of individual regions (so-called identifiable expenditure).

Departments are asked to provide a breakdown of their expenditure on delivery of services by country or region. Expenditure that can be shown to benefit individuals, enterprises or communities within particular regions, rather than the nation as a whole, is termed identifiable expenditure. Departmental identifiable expenditures are combined with estimates of local authority spending by region provided by Department for Communities and Local Government (DCLG) and the devolved administrations, together with expenditure by non-departmental public bodies and public corporations. The 2016 CRA advised that approximately £602.2 billion (representing 88% of overall TES) was identifiable and, therefore, included in the analyses. Total identifiable expenditure attributable to UK countries and regions was £575.7 billion, with £26.4 billion identified as benefiting areas located outside the UK.

The CRA analyses are presented chiefly in tabular form. To provide an indication of spending in different functional areas, in some tables expenditure is decomposed using the Classification of the Functions of Government (COFOG) framework. Expenditure is initially allocated to broad areas, such as health or education; and then split into more granular categories, such as hospital services, outpatient services, and medical products.

A fundamental approach underlying the allocation of expenditure to regions in the CRA is the "who benefits" or "spending for" principle. This requires allocating expenditure to the locality or region where the beneficiaries of the expenditure are located. Often the locations of the beneficiaries and where the spending takes place are one and the same, so "spending for" equates to "spending in".

If a local council constructs a leisure centre, which is only accessible to residents living within the boundaries of that authority, the spending occurs precisely where the beneficiaries reside. In practice there will be instances where facilities such as schools or public swimming baths built in one local authority are open to or accessible to residents of other authorities, some of which might even be in a different region. The CRA advises that: “It is neither considered practical nor cost-effective to collect local government spending data on the basis of who benefits”. Instead, local government spending is assumed to benefit the area of the spending authority. It seems reasonable to consider “spending in” as a reasonable proxy for “spending for/who benefits” in such cases.

Should a new airport be constructed with public funds, it would likely be appropriate to allocate the expenditure to the region in which it is located, on the basis that the catchment area for passengers corresponds broadly to the relevant region. Preferably such an assumption would be supported by robust evidence, for example, market research that demonstrates that the airport would principally attract passengers living within the region.

An example of non-identifiable expenditure is the construction of an aircraft carrier or submarine for the Royal Navy. The associated expenditure would mostly be in the city or town where the relevant shipyard is located. However, the benefit arising from the vessel’s construction would be shared by the entire UK population insofar as, once commissioned, the vessel would serve the entire nation.

The CRA explains why, for various reasons, the estimates that it presents are necessarily imprecise. It also provides examples of difficulties that individual government departments face in allocating certain expenditures, such as expenditure on HS2, and how these are tackled.

The CRA advises that: “If spending is not significant (less than £20 million annually on capital or current) or relevant information for allocating it to regions is not available, departments may use some statistical proxy instead. This might include using straight population shares, or the same allocation proportions as other related spending”. For the example of the naval vessel, where there is no rationale for allocating the expenditure to individual regions, an allocation to all regions based on their population shares seems appropriate, given that the vessel affords all citizens equal levels of protection.

The CRA notes that conceptual issues, such as whether an agricultural subsidy primarily benefits farmers, or the consumers who purchase the items whose production has been subsidised, may significantly impact on regional allocations in some instances.

## A disaggregation of HMRC tax receipts – an HMRC annual publication

On the revenue side, as noted previously, HMRC’s DOTR publication provides estimates, for all those taxes for which it is responsible, at country level, that is, for England, Northern Ireland, Scotland and Wales respectively. However, it does not provide any further disaggregation of the England total into the NUTS1 English regions. The receipts are not presented on an accruals basis, but on a cash basis, which means that adjustments are required to achieve consistency with tax receipts as recorded in the PSF bulletin (except for taxes for which accruals are deemed to equal cash receipts). The DOTR also provides summaries of the methods employed by HMRC to apportion UK total receipts to individual countries.

## Government Expenditure and Revenue Scotland (GERS) – A Scottish Government annual publication

The earliest estimates of the fiscal balance for a NUTS1 region to be published on a regular basis were annual GERS estimates, first published in 1992. One issue relating to revenue that is particularly relevant to Scotland concerns the apportionment of receipts from taxes levied on the production of petroleum and gas in the North Sea and associated off-shore Corporation Tax.

Two bases for apportionment present themselves. The first is to apportion on a geographical basis according to whether the fields in question are located within waters designated as Scottish or English. The second is to treat the resources and the tax revenue streams as UK-wide, and to apportion receipts to countries, regions, and possibly sub-regions in accordance with their relative shares of the UK population.

GERS estimates of HMRC tax receipts attributable to Scotland are broadly consistent with those published in the DOTR but in some instances there are differences due to the use of different sources or methodologies.

Until the publication of the Country and Regional Public Sector Finances bulletin in May 2017, the most geographically comprehensive set of estimates of fiscal balances at NUTS1 level available in the UK were provided as supplementary tables to the GERS 2013 to 2014 fiscal year edition . These Experimental Statistics included estimated relative public sector revenues and expenditure for all NUTS1 entities in the UK, including each of the nine English regions.

Northern Ireland net fiscal balance report 2012 to 2013 and 2013 to 2014 - a publication by the Department of Finance for Northern Ireland

This report provides an estimate of public sector finances in Northern Ireland for the financial years ending 2013 and 2014.. In addition to the net fiscal balance or “fiscal deficit” position for each financial year, the report contains a detailed disaggregation according to individual expenditure and revenue components. The methodologies and sources used vary only slightly from those used for GERS..

## Government Expenditure and Revenue Wales (GERW) 2016 - a Cardiff University’s Wales Governance Centre publication

The report presents a multi-year analysis of public spending, public sector revenues, and the overall fiscal balance for Wales. It uses similar methodologies and sources to those that underlie the GERS and NINFBR publications.

## Filling the coffers: London’s tax export – a publication by GLA Economics

In 2008, GLA Economics published filling the coffers: London’s tax export. This publication offers alternative approaches for allocating receipts from some main taxes. In particular it presents estimates using both a residence-based approach and a workplace-based approach.

## The Country and Regional Public Sector Finances: Scoping Study (CRPSFSS) – an ONS ad-hoc publication

This summarises the approaches and main data sources used to estimate public sector expenditure at country or regional level for the GERS and NINFBR publications. It also provides a detailed comparison of the sources and methodologies used to produce disaggregated (at country or regional level) estimates of tax receipts for the DOTR, GERS, and NINFBR publications.

## Country and Regional Public Sector Finances bulletin – a new ONS annual publication

On 23 May 2017, ONS published for the first time annual estimates of public sector receipts and expenditures, and net fiscal balances, for all UK NUTS1 regions in the Country and Regional Public Sector Finances bulletin. These estimates have initially been presented as Experimental Statistics. In compiling these estimates, ONS has maintained an ongoing dialogue with the devolved administrations, the GLA, and HM Treasury to benefit from their knowledge and expertise. It has also consulted extensively with HMRC to gain an in-depth understanding of the methodologies employed in producing estimates for the DOTR. Where ONS is satisfied that particular sources and methodologies are the best available or most practicable, these have been adopted by ONS.

The ONS disaggregated estimates published at NUTS1 level have been compiled in accordance with the European System of Accounts 2010, and are consistent with those published in the PSF monthly bulletin. ONS is conducting a consultation to gather feedback on the bulletin running 3 July to 11 September 2017.

## Comparisons between estimates derived from workplace-based and residence-based approaches

GERS, NINFBR, GERW and the GLA have all adopted the "who benefits" approach to allocating expenditure, which is consistent with the approaches adopted by HMT for the CRA and by ONS for the Country and Regional Public Sector Finances bulletin. They also all favour a "who pays" approach for revenue. GERS, NINFBR , GERW, the DOTR, and the Country and Regional Public Sector Finances bulletin provide estimates of tax receipts only on a residence basis, but the GLA has a strong preference for publishing estimates derived on a workplace basis in addition to residence-based estimates.

In filling the coffers GLA Economics provided separate estimates for some taxes based respectively on:

Where individuals live (residence-based), and where people work (workplace-based). It noted that many residents of the adjacent regions, East and South East England, commute into London for relatively well-paid work. This increases estimates of gross value added (GVA) and employee compensation in London calculated on a workplace basis, as compared with a residence basis. It also increases the London tax estimates, particularly for income or earnings-based taxes, such as Personal Income Tax (PIT) and National Insurance contributions (NICs).

The estimate for tax receipts in London using the residence-based approach was £86.4 billion. Adopting a workplace-based approach increased this to £91.9 billion. The two categories of tax receipts most impacted by the workplace- versus residence-base choice are PIT and NICs, albeit, depending on the methodology used, estimates for other taxes, such as VAT, could also alter significantly.

A more recent unpublished paper by GLA Economics compares two sets of estimates of London's share of tax revenues for 2013 to 2014, produced by the Centre for Economics and Business Research (Cebr) and the Scottish Government in its GERS publication. The paper provides comparative estimates for London, both in absolute monetary terms, and as percentages of the entire UK tax receipts, for several of the most important taxes (in terms of the amount of revenue that they raise).

The differences were, as expected, most acute for PIT and NICs. Cebr estimated London's share of PIT to be £40.4 billion, equating to 25.8% of total UK receipts from PIT. The corresponding GERS estimate is £35.6 billion, or 22.8% of the UK total. For NICs the difference is more pronounced: Cebr's approach suggests London's share was £27.8 billion or 25.8% of the UK total, while GERS indicates the share to be £20.4 billion or 19% of the UK figure.

Cebr and GERS used the same basic data source to produce their PIT estimates, that is, HMRC's Survey of Personal Incomes (SPI). The SPI provides estimates of annual PIT receipts on a residential basis for a number of subnational geographies, including NUTS1 regions, and individual local authorities. The difference in the Cebr and GERS estimates for PIT are primarily due to an adjustment by Cebr to produce a workplace-based estimate. This involves uprating the estimate for London provided by the SPI by the ratio of London's workforce to its resident population.

The difference in the two estimates for NICs also stems largely from the residential and workplace based approaches. GERS uses unpublished data from HMRC on regional NICs receipts, whilst Cebr assumes that London's share of the UK NICs total would, on a workplace basis, be approximately the same, in percentage terms, as its share of the PIT total.

At country level the differences between estimates derived from the residence- and workplace-based approaches are likely to be relatively small, as, with the exception of England-Wales, levels of cross-border commuting between the countries of the UK are limited. However, at the level of the NUTS1 English regions, differences become more pronounced. This is particularly so for Greater London, and to a lesser extent for the regions adjacent to it (that is the East and South East England), that provide many commuters who travel into London each day to undertake what is typically better remunerated employment than is available where they reside.

While a workplace based approach enhances Greater London's position as a net positive contributor to the public sector finances as compared to a residence-based approach, the opposite is the case for its adjacent regions. Arguments can be made for the validity of both approaches. Whereas estimates of sub-national GVA published by ONS were originally on a residence-basis only, over-time this has changed. Workplace-based estimates were initially published as adjuncts to the residence based estimates, but since 2014 ONS has dropped residence based estimates of GVA from its annual release of regional GVA.

# 7 . Sub-NUTS1 Estimation of Public Sector Revenue and Expenditure

This section summarises work that has been done to produce comprehensive estimates of public sector revenues and expenditures for geographies below Nomenclature of Territorial Units for Statistics (NUTS 1) level. It does so in broadly the chronological order in which such work has been conducted and published.

## Greater Manchester estimates by New Economy (2014)

The first significant attempt to produce coherent estimates of public sector revenue and expenditure below NUTS1 level was by New Economy on behalf of Greater Manchester Combined Authority (CA). The estimates were published in 'A Plan for Growth and Reform in Greater Manchester' in 2014. The plan suggested that the CA had a fiscal deficit of around £4.7 billion in the financial year ending March 2013, but it articulated an ambition for the CA to become a net contributor to the UK public sector finances (PSF) by 2020.

The Manchester city region has become increasingly interconnected over time, including labour, housing and retail markets, transport networks, cultural attractions, education and training opportunities and the provision of public services, and the plan affirmed that "working at the geography of the city region makes sense".

A key strength of this exercise to estimate the CA's fiscal balance was the access enjoyed by its researchers to records of public expenditure undertaken by the 10 local authorities that make up the CA and other local agencies. This enabled them to develop a comprehensive and detailed picture of expenditure undertaken by local councils.

Additional data was derived from financial statements of agencies located within Greater Manchester, including Greater Manchester Police, the Fire and Rescue Services, and primary care trusts (since replaced by clinical commissioning groups). Expenditure on welfare was derived from Department of Work and Pensions (DWP) benefits data and Her Majesty's Revenue and Customs (HMRC) data on tax credits and child benefit, all of which are available at local authority district level. Ministry of Justice (MoJ) departmental spending was apportioned to the Greater Manchester CA, using its share of overall recorded crime as an indicator of its demand for /consumption of MoJ services.

The report concluded that in 2012 to 2013 Greater Manchester accounted for around £22.4 billion of annual public expenditure. It acknowledged that estimating public sector receipts is more difficult as most taxation is collected nationally, and the only major sources of tax receipts that could be easily determined for Greater Manchester were Council Tax and Non-Domestic Rates (NDR). Therefore, it decided to adopt a relatively simple method to estimate overall tax receipts for the city-region.

The calculation of tax receipts attributable to the CA was based on an assumption that its share of tax receipts would be broadly similar to its share of gross value added (GVA). In 2012, Greater Manchester had, according to ONS Regional Accounts, generated GVA of around £51billion. The plan's authors noted that at UK level taxation receipts equated to approximately 35% of GVA. Hence, using that proportion of 35%, they estimated that the CA accounted for approximately £17.8 billion of revenue from taxation. On that basis they inferred that Greater Manchester was a "cost centre" for the UK, absorbing over £22.4 billion of public expenditure, but only generating £17.8 billion in tax revenues.

The report asserted that the cost of providing public sector services is becoming increasingly unsustainable, with a rising proportion of expenditure taken up in meetings costs associated with dependency, leaving less available to fund initiatives to increase growth and reduce the demand for reactive services. Its authors, therefore, sought to quantify the elements of spend that were proactive (that is, designed to reduced dependency on the state) and those that were reactive, such as responding to crime, unemployment, or unplanned hospital admissions.

Of the £22.4 billion of expenditure, approximately £7 billion was identified as reactive spending, which could potentially be reduced by better targeted proactive spending. The largest areas of expenditure in the reactive category were welfare benefits, and spending on health and social care. The report concluded that the key to reducing the £22.4 billion of expenditure was to work with government to drive down those costs via better management of demand.

Based on various forecasts and assumptions, it was concluded that: "If empowered to take control over the levers and resources which impact on our ability to deliver economic growth and to improve the quality of life for local residents, by 2020 to 2021 we estimate that tax take in Greater Manchester will have risen to £21.5billion and public expenditure will have fallen to £21.2billion".

Following the publication of the Growth and Reform Plan, Greater Manchester secured an initial £477 million from the Government's Local Growth Fund.

## West Midlands estimates by Black Country Economic Intelligence Unit (2015)

In February 2015 the Black Country Economic Intelligence Unit (EIU) was tasked with calculating a fiscal balance for the West Midlands Combined Authority (WMCA) geography, to ascertain whether the WMCA also appeared to be a "cost centre" from a public sector finances (PSF) perspective.

The EIU's initial approach closely mirrored New Economy's "Manchester Model". Public sector revenue was calculated as 35% of the CA's GVA. And estimates of public sector expenditure were derived using published accounts for the same set of services that had been examined by New Economy. Subsequently the EIU sought to develop a more robust model by attempting to identify some key itemised sources of public sector revenue.

In its 'Technical Appendix (Fiscal Impact) to the West Midlands Strategic Plan', the EIU included estimates derived from each of two approaches or "scenarios" as it describes them. The first approach was based on the same sources and methods underlying the Manchester model, and referred to as Manchester 1. The alternative scenario (labelled Manchester Scenario 3 by the EIU) utilised an identical approach on the expenditure side, but on the revenue side it replaced the 35% of GVA estimate with a combination of estimated revenues generated from the following set of taxes: stamp duty land tax, vehicle excise duty, personal income tax (PIT), national insurance contributions (NICs), NDR, and council tax.

For both scenarios the EIU calculated the resulting fiscal deficit for both the combination of local enterprise partnerships (LEPs) within the WMCA, and a grouping of the seven metropolitan areas that WMCA encompasses that is Birmingham, Coventry, Dudley, Sandwell, Solihull, Walsall, and Wolverhampton. For the LEPs the first scenario suggested a fiscal surplus of £10.3 billion, while the alternative scenario indicated a surplus of £6.2 billion. While for the "met" combination, the first scenario suggested a surplus of £7.1billion, while the alternative indicated a surplus of £2.1 billion.

Therefore, the alternative Manchester 3 scenario produced estimates for fiscal surplus that were £4.1 billion less for the LEPs and £5 billion less for the "met" combination, than those resulting from the first scenario. This is due to the estimated combined revenues from the six taxes identified under the Manchester 3 scenario, being substantially below the estimates derived using the 35% of GVA calculation applied under the Manchester 1 approach.

## Estimates by Centre for Cities (2015)

Also in 2015 Centre for Cities began work aimed at presenting "for the first time an evidence base on the geography of tax and spend across the country to better inform debate around austerity, devolution, public sector efficiency and investment for growth". This culminated in the publication in July 2015 of 'Mapping Britain's public finances: Where tax is raised, and where it is spent'.

'Mapping Britain's public finances' was a pioneering endeavour in terms of estimating the public sector fiscal balance for all council led local authorities individually within Great Britain. As access to data on public sector revenue at local level was less accessible for Northern Ireland, which at the time was experiencing a significant restructuring of its system of local government, estimates were not produced for the newly established districts of Northern Ireland.

On the expenditure side Centre for Cities' estimates used relevant sources of data available at local authority level (or regional level), in particular expenditure by local authorities published by DCLG and the devolved administrations, and data on benefits published by DWP and HMRC. Where appropriate Centre for Cities apportioned expenditure by single-purpose authorities or shire counties to reflect the fact that expenditure incurred on certain services, such as policing, provides benefits to residents of other local authorities.

Rather than focussing primarily on building up other blocks of public sector expenditure from accounts published by individual agencies, Centre for Cities chose to utilise expenditure estimates provided in the Country and Regional Analysis (CRA) to obtain a somewhat more comprehensive measure of public sector expenditure at local authority level than those used by New Economy and the EIU in their earlier work.

To apportion additional expenditure reported in the CRA as identifiable at regional level to constituent local authorities, Centre for Cities used various indicators that it felt best matched the type of expenditure (as indicated by relevant COFOG classification). These indicators included: population, age profiles, and local level data on benefit expenditure. Non-identifiable national expenditure was apportioned to local authorities on a per capita basis using ONS mid-year population estimates.

On the revenue side Centre for Cities devised methodologies for apportioning to individual local authorities receipts from the suite of taxes for which HMRC is responsible. These methodologies are presented in Annex 2, along with some additional commentary. Centre for Cities also incorporated receipts from Council Tax and NDR published by DCLG and the Scottish and Welsh devolved administrations at local authority level.

Having produced estimates at local authority level, Centre for Cities was then able to produce estimates for all LEPs, CAs, and city regions within Great Britain, by combining results for the constituent authorities. One of the inferences drawn from the estimates was that for Greater Manchester, Greater London and the West Midlands (the three largest city-regions) it is the “city centre” local authorities that are the main generators of tax for the city-region. However, less tax would be generated there without support from their surrounding local authorities, which provide a large share of workers who raise tax in the core but consume public services elsewhere. Centre for Cities concluded that combined authorities should, therefore, span the geography over which people live and work.

In terms of classifying taxes and expenditure by function, Centre for Cities adopts its own taxonomy. Taxes are conventionally grouped into three main categories or types: indirect taxes defined as taxes linked to production and imports (such as VAT); direct taxes consisting of current taxes on income and wealth, such as PIT, corporation tax, and capital gains tax; and net social contributions, which in the UK takes the form of NICs. Centre for Cities prefers an alternative demarcation. Noting that most taxes are dependent on the growth of the economy and are levied on activities that governments are likely to want to encourage (for example job creation), it classifies these as “economy taxes”. Other taxes levied on commodities or activities that Centre for Cities felt government policy was unlikely to encourage, such as duty on alcohol or tobacco, are classified as “other taxes”.

Centre for Cities subdivides economy taxes into those levied on labour, land and property, consumption, and capital. For analytical purposes it split overall expenditure into the following five broad categories: National, comprising all spending for the entire nation’s benefit, such as defence and the prison service; Public services, such as health, education, recreation and leisure services. Infrastructure, economy and environment, including house building, transport infrastructure and environmental protection; Old age, comprising spending on pensions and winter fuel allowance payments; Benefits, such as unemployment, disability and housing benefit.

Centre for Cities’ analyses encompasses all taxes and duties collected by HMRC. Annex 2 of this scoping document provides details of the apportionment methods and sources used by Centre for Cities to disaggregate revenues to local authority level. However, Centre for Cities did not include two taxes that are collected by other agencies, and which generate quite significant amounts of revenue, albeit those amounts are relatively small in relation to receipts from taxes such as PIT, NICs, VAT, and corporation tax. The excluded taxes are Vehicle Excise duty and TV license fees.

Centre for Cities favours a workplace based approach to the apportionment of taxes, stating that its methodology “is based on HMRC rules for where and when products or services become taxable and who is liable for paying the tax, and crucially follows one key principle: thinking about where taxes are generated by economic activity, as opposed to where data happens to be collected”. As justification for this approach it asserts that “Given almost 50 % of people in cities live and work in different local authorities, it was important to capture where jobs are generating tax revenue rather than where workers happen to live”.

Its preference for a workplace-based approach led Centre for Cities to generate its estimates of revenues from PIT and NICs on estimates of earnings from employment in each local authority, rather than relying on residence based estimates derived from HMRC’s Survey of Personal Incomes (SPI) which are discussed in Section 6 of this scoping study. Hence Centre for Cities’ approach is not aligned with the residence based approach that underlies the methodologies used for apportionment in DOTR, GERS and NINFBR. Rather, it reflects the workplace based approach favoured by GLA Economics and others to estimate London’s tax take, albeit the precise methodologies employed differ somewhat. The basic Manchester model can also be considered as fundamentally workplace-based, insofar as the sub-regional estimates of GVA used to estimate tax revenues were produced on a workplace basis.

The workplace based approach also follows through into Centre for Cities estimation of revenues from several taxes that fall within its “other” category. These include Petroleum Revenue Tax, and duties on tobacco, spirits, wine, beer and cider, and betting and gaming. For such taxes the DOTR, GERS and NINFBR publications use, as apportionment indicators, household expenditures at regional level on relevant goods and services, derived from the ONS Living Costs and Food Survey. Centre for Cities prefers alternative workplace focussed indicators that is local authorities’ shares of employment in relevant industries such as distillation of spirits, or manufacturing of cigarettes and other tobacco-based products.

Centre for Cities estimates were produced for the 2013 to 2014 fiscal year and utilised tax revenue totals published for that year by HMRC. As CRA estimates for 2013 to 2014 regional expenditure levels were not available at that time, Centre for Cities chose to upscale the 2012 to 2013 estimates in line with published increases in overall public sector expenditure. Centre for Cities currently appears not to have any plans to repeat the exercise and produce an updated version of ‘Mapping Britain’s public finances’.

## Further developments (2015 onwards)

For its part the Black Country EIU has continued to refine its approach to estimating fiscal balances, and in doing so has moved very closely towards the approach and methodologies used by Centre for Cities. For its latest estimates it replicates Centre for Cities apportionment approach almost exactly, apart from one or two minor taxes. Rather than producing estimates for a particular fiscal year the EIU tends to take on the most recently available data to update its estimates. As noted above the EIU’s calculations for the West Midlands “met” combination, the Manchester 1 scenario suggested a surplus of £7.1billion, while the Manchester 3 scenario indicated a surplus of £2.1 billion. By contrast, the approach that replicates the Centre for Cities methodologies suggests a deficit of £4.3 billion.

New Economy too has been reviewing sources and methods. Moreover, it has been commissioned by Core Cities and the Local Government Association (LGA) to develop a new tool to produce estimates of fiscal balances for all local authorities at unitary and district levels throughout the UK, including Northern Ireland. The tool, known as ESPRESSO, is available.

ESPRESSO is Excel based and provides expenditure and revenue data at local authority district level and unitary authority, which can be combined to create estimates for larger areas, such as shire counties, LEPs, CAs or NUTS regions. Currently, the tool provides estimates for two financial years, 2013 to 2014 and 2014 to 2015, and New Economy has advised that it intends to incorporate data for future years as it becomes available.

The New Economy website also provides two documents to accompany the Excel worksheets. A Guidance document outlines the purpose, evolution and possible applications of ESPRESSO, particularly in regard to its use in facilitating and informing decisions around devolution. It also provides advice on using the tool, which is particularly helpful for users wishing to aggregate data over larger or combined geographies, such as LEPs or city regions. It advises that the tool focuses primarily on the provision of net expenditure figures and so does not necessarily seek to show gross expenditure and income separately.

The Guidance document also touches on a variety of issues relating to methodology, particularly in regard to apportionment, and data sources. For example, it explains how apportionment of expenditure is achieved when, as is sometimes the case, the jurisdiction of public sector bodies, such as clinical commissioning groups (CCGs) or national parks cover only part of a local authority district or unitary authority. Where this involves a CCG, an ONS look-up tool is used to identify the set of lower layer super output areas (LSOAs) within the CCG. As LSOAs align within local authority district boundaries, their populations can be used to apportion CCG expenditure to local authorities.

The second document is entitled Methodology. It sets out various principles underlying the choice of sources and methodologies used in the tool, and also alludes to ways in which the tool may be further enhanced or developed in the future. It includes four appendices. The first of these, Appendix A, details the methodologies and data sources used to disaggregate all HMRC collected taxes and in addition, Vehicle Excise Duty and TV license fees (two taxes excluded from Centre for Cities’ analyses).

Appendix B details the methodologies and data sources New Economy employed for deriving expenditure in different service categories in each of the countries. For example, it advises that data on reported crimes are used to disaggregate elements of spending on “Protective, central and other services” in England and spending on policing in Scotland.

Appendix C lists all local authority districts and unitary authorities within each of the countries of the UK. For those in England, the shire county or metropolitan area (where applicable) and NUTS1 region within which the authority is located are appended. Appendix D shows the constituent local districts of English shire counties and the local districts or unitary authorities that constitute or are served by a range of single purpose authorities or agencies within the UK.

An important principle underlying New Economy's choice of sources and methods is to use local data where available. Sources that provide data at local authority, sub-regional or regional level are preferred over sources that only provide data at UK level. However, to account for non-identifiable public expenditure (which cannot meaningfully be allocated to individual regions or lower geographies) or regional level data that it has not taken on, New Economy include an expenditure category in ESPRESSO that is labelled "National government expenditure".

New Economy essentially derives a value for National government expenditure as a residual. This involves subtracting the (local level) expenditures provided by DCLG, DWP, HMRC, the devolved administrations, or extracted from published accounts of local agencies, from Expenditure on Services (both identifiable and non-identifiable) for the UK, as presented in HMT's Public Expenditure Statistical Analyses.

On the revenue side, for PIT, the tax that raises more revenue nationally than any other, New Economy has adopted a workplace-based approach to derive estimates at local district level. However, in its Methodology document it states that "an option for switching between workplace-based and residence-based methodologies is currently being considered."

For the subset of other taxes for which Centre for Cities use data on employment in the relevant or related industry for apportionment of revenues to local authorities (that is, taxes such as Petroleum Revenue Tax and duties on tobacco, spirits, wine, beer and cider, and betting and gaming), New Economy does not adopt such a workplace-based approach. Instead it uses other sources, such as household expenditure per region on relevant items such as cigarettes and alcoholic beverages, provided in the annual Family spending publication.

## Some differences between sub-NUTS1 estimates and PSF estimates at aggregate level

Neither Centre for Cities, New Economy or the Black Country EIU aim to produce estimates that are entirely consistent with important public sector finance aggregates or headline statistics published by ONS, which have to be compiled in accordance with the European System of Accounts 2010 (ESA 2010). On the expenditure side, Centre for Cities and New Economy align their UK totals with HMT aggregates on Expenditure on Services, as published in PESA or the CRA, which include both identifiable and non-identifiable expenditure.

As noted in an earlier section of this scoping study, various accounting adjustments have to be made to Expenditure on Services to arrive at Total Managed Expenditure (TME), which is consistent with national accounts principles and ESA 2010. The EIU prefers to exclude non-identifiable expenditure from its total which is, consequently, further removed from TME.

In terms of revenue, the UK totals published by the three research institutes are broadly in line with data published in the public sector finances (PSF) statistical bulletin. For example, for 2014 to 2015, New Economy's ESPRESSO tool shows estimated total revenue of £579.3 billion. The ESPRESSO total is quite close to the figure of £601.3 billion provided in the PSF bulletin for "Total Public Sector Taxes and NICs". This is to be expected as both totals comprise mostly HMRC receipts.

The discrepancy in the tax receipts (including NICs) totals of £22 billion is largely due to the fact that the ESPRESSO total excludes VAT refunds of around £13.7 billion. It also excludes receipts of environmental levies and the EU Emissions Trading Scheme (ETS) Auction, which account for a further £4.1 billion, and other miscellaneous taxes and levies. Conversely, the ESPRESSO total includes receipts of £3.0 billion for customs duties, which are collected by HMRC but are a resource of the EU and are, therefore, excluded from the public sector finances.

A supplementary table in the March 2017 PSF bulletin provides a total of £657.4 billion for public sector current receipts for 2013 to 2014. So in addition to the £601.3 billion of receipts from taxes and NICs, an additional £56 billion of revenue was recorded from three other sources: public sector interest and dividends (£6.3 billion), public sector gross operating surplus (£44.7 billion), and other public sector receipts (£5.0 billion). These three sources are excluded or only partially accounted for in the ESPRESSO tool, and in the analyses conducted by Centre for Cities and the EIU.

# 8 . Data quality and related data issues

This section looks at certain data quality and methodological issues relating to estimating fiscal balances at local authority district level, that is, for metropolitan and non-metropolitan district councils, London boroughs, and unitary authorities. It is not a comprehensive examination of all data quality issues. It starts by considering how much "hard" data is available at local authority level and, by default, how much has to be apportioned to authorities using one or more indicators. It then looks at some particular examples of apportionment in some detail.

As noted previously, certain data on public sector expenditure and revenue is collected for administrative purposes and published specifically at local authority level, principally by Department for Communities and Local Government (DCLG), the devolved administrations, Department for Work and Pensions (DWP) and HM Revenue and Customs (HMRC). However, the bulk of public sector finance data, particularly that relating to revenue, is only available at regional or national level. The following two subsections provide some perspective on this in relation to expenditure data and revenue data respectively.

## Expenditure data

On the expenditure side, the vast majority of expenditure on benefits (social protection) by DWP is identifiable at local authority district level. DWP estimates that £163.4 billion (or 95.1%) of its total expenditure of £171.9 billion in Great Britain for 2015 to 2016 was identifiable and published at local authority district level. In Northern Ireland, responsibility for the payment of corresponding benefits rests largely with the Department for Communities, which does not provide a breakdown at local authority level of its expenditure on benefits (social protection), which totalled around £8 billion in 2015 to 2016.

While HMRC does not directly provide data on the total value of payments it makes for tax credits and child benefit at local authority district level, it is possible to estimate these amounts with quite a high degree of accuracy. This is because HMRC provides data at this geography for numbers of families benefitting from tax credits and the average value of the award, and for the numbers of families with differing numbers of children receiving child benefit. As HMRC has UK-wide responsibility for these payments, the expenditures involved, totalling around £40.5 billion in 2015 to 2016, can be directly attributed to local districts within the UK, including Northern Ireland.

DCLG and the Scottish and Welsh devolved administrations publish data on expenditures by individual local authorities within their relevant jurisdictions in some detail. Current and capital expenditure on services by these authorities for 2015 to 2016 was in the order of £140 billion. While all of this can be attributed to individual authorities, significant elements within this expenditure are undertaken by single purpose authorities or English shire counties.

Since other local council districts are beneficiaries of such expenditures, elements should be apportioned to them accordingly. Typically this involves apportionment using ONS mid-year population estimates at local authority district level, although other relevant indicators may be used, such as crime rates for expenditure on policing.

Taking into account the need to apportion elements of spending by local authorities, it is evident that, of the total UK public sector expenditure on services of £700.1 billion in 2015 to 2016, less than half can be directly attributed to local authorities at district or unitary level. The remainder has to be allocated by apportionment using relative population sizes, or possibly other indicators that may be more relevant or appropriate.

## Revenue data

Two principal taxes are collected locally in England, Scotland and Wales. These are Council Tax and non-domestic rates (NDR), with broadly equivalent domestic and business rates being collected in Northern Ireland. Data on receipts and collection rates for these taxes are published by DCLG and agencies within the devolved administrations. The data are based on administrative records maintained by the local authorities that collected and/or received the payments. While the data may not be completely error free, they will have been subjected to a range of validation checks, which should mean that the data are highly accurate at local authority district level.

In 2015 to 2016, Council Tax, NDR and their equivalents in Northern Ireland jointly produced revenue of around £55.2 billion. This comprises just 8.8% of the total receipts from taxes and National Insurance contributions (NICs) (£625.2 billion), and 8.1% of total public sector current receipts (£682.2 billion) for that financial year. This means that to allocate all such receipts to local authorities requires apportioning and/or modelling over 90% of receipts in value terms.

As noted earlier in this scoping study, Centre for Cities apportionment methodologies and sources are detailed in Annex 2. New Economy's methodologies and sources are presented in its Methodology document that accompanies the ESPRESSO tool, and are also referenced in some instances in Annex 2.

## Additional data quality issues

### Estimating receipts from personal income tax (PIT)

The single most important source of public sector revenue is Personal Income Tax (PIT) which, according to the Disaggregation of Tax Receipts (DOTR), accounted for £168.5 billion (or 31.6%) of HMRC's total receipts of £533.7 billion for fiscal year 2015 to 2016. As noted previously in this scoping study, there are two possible bases for estimating PIT at any sub-national geography: on a residential basis and on a workplace basis.

Publications such as A Disaggregation of HMRC tax receipts (DoTR), Government Expenditure and Revenue Scotland (GERS), and the net fiscal balance report (NINFBR) have provided estimates on a residence basis only and this is the approach that has been taken in the first Country and regional public sector finances bulletin, which was published in May 2017. Conversely, Centre for Cities, the Black Country EIU and New Economy have elected to publish workplace-based estimates only, albeit the latter has indicated that it might switch from a workplace-based to a residence-based methodology.

For residence-based estimates at local authority level, the preferred source is HMRC's Survey of Personal Income (SPI), from which HMRC derives estimates of total PIT paid by residents of each local authority within the UK. The SPI is based on a large sample, comprising approximately 728,000 records of individuals in 2013 to 2014. Compared to most official surveys, this is an extremely large sample and it is also stratified to increase the precision of estimates.

HMRC uses its Personal Tax Model (PTM) to compute an estimate of PIT liability for each record in the SPI sample. The PTM simulates the UK PIT system, incorporating parameters such as rates, thresholds, allowances, reliefs and rebates.

Stratification for the SPI is primarily intended to ensure that records of higher rate tax payers are adequately represented in the sample. HMRC does not stratify the sample in terms of geography. This means that sample sizes for certain local authorities will be relatively small, and this is likely to be especially so for authorities that have relatively small residential populations, such as the Scilly Isles and the Scottish Islands. This implies that the estimated receipts from PIT for such authorities will be much less precise than estimated receipts for larger authorities.

To provide users with guidance on accuracy, HMRC produces confidence intervals for the estimated numbers of residents subject to PIT, the average amount that they are liable to pay, and the estimated total revenue. A confidence interval comprises a range enclosed by a lower limit or boundary and an upper limit. HMRC publishes 95% confidence limits. This means that if 100 samples were taken using the same selection method, 95 of those confidence limits would include the true or correct value. The common interpretation is that there is just a 5% chance that the true value lies outside the range defined by the limits.

Table A in Annex 3 provides examples extracted from Table 3.14a in the SPI publication, Personal incomes statistics: tables 3.12 to 3.15a for the tax year 2013 to 2014. These examples illustrate how less precise estimates of PIT receipts are for smaller local authorities, when compared with those with bigger populations (and sample sizes) and combined authorities (CAs). For the Greater Manchester CA, Table A shows that the percentage difference between central and upper and lower estimates for total receipts from PIT is around 3%. This implies that the amount of PIT that would be apportioned to Greater Manchester CA using the SPI central estimate is unlikely to be more than 3% higher or lower than the true amount.

Table A also shows that for Birmingham, the largest single local authority within the UK, the margin of error around its estimated share of PIT is 4%. For a medium-sized local authority district, such as Halton, the margin of error is somewhat higher at around 11%. However, for smaller local authorities, these margins can be much higher, as illustrated by West Somerset, with a margin of around 44%. It may seem surprising that margin of error for the authority with the lowest number of taxpayers, City of London, is lower in percentage terms than those for authorities such as Rutland and West Somerset, which have considerably higher numbers of resident taxpayers. This is due to the much higher proportion of high earners residing in the City of London. Given HMRC's stratification strategy of ensuring that records of higher-rate tax payers are adequately represented in the sample, this means that a considerably higher proportion of residents of City of London will be included in HMRC's sample than in less affluent authorities.

Another factor that should be noted in relation to the residence-based estimates of PIT from the SPI is that the outputs may not be as timely as users might wish. Currently, the most recent year for which local authority level data have been published is 2013 to 2014.

If one elects to estimate PIT receipts for local authorities on a workplace basis, the sources chosen by both Centre for Cities and New Economy are currently the best available. Both elect to use outputs from two ONS business surveys, the Annual Survey of Hours and Earnings (ASHE) and the Business Register Employment Survey (BRES). The data are used to estimate earnings from employment in each local authority. Given that responding to ONS business surveys is mandatory under the Statistics of Trade Act, response rates are high for both surveys.

ASHE is based on a 1% sample of employee jobs selected from HMRC Pay-As-You-Earn (PAYE) records. Information on earnings and hours is sought from the relevant employers. Based on the responses and the postcodes of the employee and the place of employment, we produce both residence-based and workplace-based estimates of earnings at local authority level.

A similar proviso for estimates for local authorities with small populations applies to ASHE estimates as to the SPI estimates. However, the lack of precision in the ASHE estimates is illustrated, not with confidence intervals, but rather by assigning estimates to alternative "statistical robustness" bands according to their coefficient of variation (CV). The CV is the ratio of the standard deviation (a measure of variability amongst the data points in a sample) to the mean (the average value of the data points in the sample).

As illustrated in Table 1, which accompanies the ASHE estimates, any estimates with CVs below 5% are considered precise. The higher the CV associated with an estimate, the lower its precision or robustness, and estimates with CVs of at least 20% are described as unreliable for practical purposes.

**Table 1: Understanding coefficient of variation**

| Key | Statistical robustness |
|---|---|
| CV <= 5% | Estimates are considered precise |
| CV > 5% and <= 10% | Estimates are considered reasonably precise |
| CV > 10% and <= 20% | Estimates are considered acceptable |
| x = CV > 20% | Estimates are considered unreliable for practical purposes |
| .. = disclosive | |
| : = not applicable | |
| . = unavailable | |

Publication of certain estimates has to be suppressed due to them being identified as disclosive, which means that publishing them could feasibly compromise confidentiality. ONS and other government departments that collect data via surveys undertake not to publish any estimates that could lead to the identification of any data supplied by an individual respondent. This is important as it acts as a guarantee of confidentiality and is instrumental in achieving and maintaining high response rates.

In the context of ASHE estimates, disclosure is most likely to be problematic for local authorities in which just a small number of employers are located. It should be noted that disclosure can also lead to suppression of administrative data that relates to the PSF. Examples include HMRC’s inability to use administrative data on bank levy payments by banks to apportion total receipts to individual countries in the DOTR, to prevent possible disclosure of banks’ equity and liabilities. Instead, it apportioned receipts to countries based on their population shares. Likewise, HMRC initially judged that it was unable to publish administrative data on offshore Corporation Tax for 2014 to 2015.

ASHE provides an estimate of average (mean) gross pay per employee in each local authority district. From this, the average tax paid per employee is estimated using information on personal tax allowances available from HMRC. Multiplying by the number of employees in the local authority district, sourced from the Business Register and Employment Survey (BRES), provides an initial estimate of total tax take from earnings from employment in each local authority. These estimates can then be scaled upwards or downwards such that the total receipts summed over all authorities match the total published by HMRC.

A limitation with this workplace-based approach is that it does not fully take into account other sources of income that are liable to be taxed under PIT. The two most important of these, in terms of contributions to overall receipts, are earnings from self-employment and incomes from pensions. ASHE does not cover self-employment and no other reliable sources of income from self-employment are available on a workplace basis.

Since income from pensions is by and large received by people who are no longer in employment, it arguably does not essentially have a workplace dimension. Therefore, one might choose to incorporate estimated tax receipts from pensions on a residence basis even if taking an approach that is primarily workplace based. Table 3.14a in the SPI publication provides estimates of numbers in receipt of pensions and the average incomes from those pensions. Using this data, estimates of tax paid on pension income can be derived.

Subtracting estimated total tax derived from pension income from HMRC’s overall receipts of PIT yields an estimate of total tax levied on income from employment (employees and self-employed). The total tax generated from employment earnings can then be apportioned to local authorities on the basis of their ASHE and BRES data. This is broadly the approach used by New Economy and Centre for Cities to derive their workplace-based estimates of PIT receipts. It implicitly assumes that the ratio of PIT generated from employment and self-employment respectively is broadly similar in different local authorities.

Another survey that provides data that may be used for apportioning receipts from a range of taxes is the Living Costs and Food Survey (LCF). The LCF is the primary source of official information on household expenditure on goods and services. It is a voluntary survey of private households, with individuals within selected households being asked to keep diary records of their expenditures.

The LCF yields data on expenditure on a wide range of goods and services and is stratified according to several variables, one of which is NUTS 1 region. This means that the survey has been designed in part with the aim of producing reasonably robust estimates of expenditure at regional level. The main results are published in our annual Family Spending report and by the Department for Environment, Food and Rural Affairs (DEFRA) in its annual "Family Food" publication.

The Family Food publication provides estimates, for each NUTS 1 region, of average expenditure per person per week on various types of food and drinks, including a range of alcoholic drinks. This data can be used to apportion duties on various types of alcohol and has been used in the DOTR, GERS and NINFBR publications. New Economy has also used the data to apportion duties on alcoholic drinks initially to regions and then further apportion to local authorities using population shares. However, caution needs to be taken in using basic data.

If you examine estimates of average spending on certain types of alcohol over a number of years, it is evident that the annual estimates can be quite volatile, moving in quite an erratic fashion. To some extent this is reflected in the quality measures (in the form of relative standard errors) that accompany the estimates. One way of reducing volatility in the annual series, which will result in more consistent estimates from apportionment, is to smooth the series. This implies that the estimated expenditure on an item for any particular year that will be used for apportionment will be a weighted average of the original estimate (as published in Family Food) and the estimates for one or more adjacent years.

The Family Spending report provides measures of overall spending by households, which are further disaggregated into a comprehensive set of expenditure categories. This makes it feasible to use regional estimates to apportion additional taxes such as tobacco duties, betting and gaming duties, insurance tax and fuel duties. In view of the volatility shown by annual series, we elect to combine 3 years of data when presenting spending broken down by country and region to improve the robustness of estimates. Family Spending regional estimates also underlie both Centre for Cities and New Economy's apportionment of VAT receipts to local authorities, although the methodologies differ in detail.

The LCF is consequently an important source for producing estimates of receipts at both regional and local authority level. However, the robustness of some estimates even at regional level is less than one would wish. This is primarily the result of inadequate sample sizes. Unfortunately, as with other official surveys targeting households, response rates for the LCF have been declining, dropping from around 60% in 2000 to 2001 to around 46% in 20015 to 2016. Recognising this, the devolved administrations in Northern Ireland and Scotland have decided to finance collection of LCF data from larger samples in their jurisdictions.

### Making greater use of administrative data

Recognising that estimates produced from sampling can be problematic in terms of their precision (especially at low levels of geography) and timeliness, the Bean Report called upon ONS to make greater use of administrative data. To this end research is underway to see how certain datasets to which we already have access can be fully exploited. For example, VAT administrative datasets are being examined to see how they might be used to inform and improve estimates of business activity at local levels. This could potentially enable superior estimates of gross value added (GVA) and public sector finances to be derived at local levels.

There are provisions within the Digital Economy Act 2017 that will potentially provide us with access to rich sources of administrative data from a wide range of public bodies, including HMRC. Preparatory work is already underway to explore how some of these data sources, such as PAYE records, can be best exploited to yield improved estimates for a broad range of economic statistics. We are also seeking to harness additional expertise via the establishment of the Economic Statistics Centre of Excellence, which will sponsor collaborative work between ONS and external experts working in academia or other fields.

Administrative datasets offer the best prospect of obtaining robust PSF estimates at local authority district level. But the complexity of much administrative data, which in most cases have not been collected in ways that make them amenable to the extraction of PSF estimates, will present many challenges for us, which will not be easily resolved.

# 9 . Conclusion

There appears to be an appetite for, and interest in, sub-regional public sector finances (PSF) data, in part stimulated by devolution of responsibilities, powers and funding to combined authorities and city regions, local enterprise partnerships (LEPs) and to individual local authorities (retention of non-domestic rates (NDR)).

On the expenditure side, there is a considerable amount of hard data, collected for administrative purposes, that is identifiable and accessible or published at local authority level (less so for Northern Ireland). This includes expenditure on social protection by Department for Work and Pensions (DWP) and HM Revenue and Customs (HMRC), and spending by individual local authorities published by Department for Communities and Local Government (DCLG), the Scottish Government and the Welsh Government.

But over half of total public sector expenditure still needs to be apportioned to arrive at estimates that, when aggregated, will agree, in broad terms, with totals published by ONS and HM Treasury (HMT). Identifying and applying appropriate indicators for apportionment can be challenging. Often our mid-year population estimates are used for simple per capita apportionment to local authority districts in the absence of alternative indicators.

Presentations of spending by local authorities by DCLG, the Scottish Government and Stats Wales use broadly similar categories (loosely Classification of Functions of Government (COFOG) related), but there are differences that inhibit direct comparisons or joint presentations of disaggregated data.

On the revenue side, the proportion of aggregate revenues identifiable at local authority level is considerably lower than for expenditure. Council Tax and NDR (rates in Northern Ireland) are the major sources of tax revenue readily available at local authority level and some data on individual authorities' revenues from other sources (such as fees, fines or trading) are available from DCLG, the Scottish Government and the Welsh Government. Stamp Duty land tax receipts are also available at individual local authority district level. But the great bulk of public sector revenue can only be attributed to local authority districts via apportionment using one or more indicator sets.

In most instances, estimates of revenue streams obtained by apportionment are unlikely to be robust. The main exception is for residence-based estimates of Personal Income Tax (PIT) derived from the Survey of Personal Incomes, which are very precise for large cities and agglomerations such as city-regions. However, for small local authority districts, levels of precision are much lower. It is possible to use estimates from the Annual Survey of Hours and Earnings (ASHE) and the Business Register and Employment Survey (BRES) to produce workplace-based estimates for PIT at local authority level, as these provide estimates of earnings and employment respectively at district level. Nevertheless, issues around robustness and lack of data on earnings for the self-employed and on income from other sources, mean that margins of error for such estimates are likely to be notably higher than for the corresponding residence-based estimates.

There are also concerns around the robustness of estimates derived from the Living Costs and Food (LCF) Survey that are typically used for apportionment of VAT and duties on alcohol and tobacco, given that some of the indicator variable time series derived from the LCF can be quite volatile, even at regional level.

Centre for Cities and New Economy have done some interesting and innovative work and produced PSF estimates for a range of geographies, including LEPs and city-regions. However, their inevitable extensive reliance on apportionment means that users of their estimates, particularly those relating to net fiscal balances for small and medium-sized local authority districts, should treat those estimates with some caution.

There appears to be limited scope at present for adding substantial value to sub-regional estimates that have been produced by Centre for Cities and New Economy. Certainly, there is little prospect that estimates of net fiscal balances for sub-regional geographies, based on current sources and methods, could achieve National Statistics status. The Digital Economy Act offers the prospect of greater access to administrative data for ONS, particularly to HMRC datasets. This may eventually enable us to significantly improve the quality of estimates of public sector revenue for lower level geographies.

# 10 . Glossary

## A Disaggregation of HMRC tax receipts (DoTR)

An annual publication by HM Revenue and Customs (HMRC) that presents country level breakdowns for each of the taxes collected by HMRC. The disaggregation involves apportioning UK totals to England, Northern Ireland, Scotland and Wales.

## Barnett formula

The Barnett formula is a mechanism used by HM Treasury in the UK to automatically adjust the amounts of public expenditure allocated to Northern Ireland, Scotland and Wales to reflect changes in spending levels allocated to public services in England, England and Wales or Great Britain, as appropriate.

## Bean review

Professor Sir Charlie Bean was commissioned to carry out an independent review of UK economic statistics. Recommendations in his report published in March 2016 included removing obstacles to the greater use of public sector administrative data for statistical purposes, including through changes to the associated legal framework, while ensuring appropriate ethical safeguards are in place and privacy is protected.

## Black Country Economic Intelligence Unit

A research unit that has produced estimates of fiscal balances for the West Midlands Combined Authority and local enterprise partnerships (LEPs) within the West Midlands

## Blue Book

An annual ONS publication that records and describes economic activity in the UK in accordance with national accounting principles and the European System of Accounts 2010. It is an important source of data for monitoring the economic progress of the UK.

## Budget deficit

When public sector (or government) current expenditure (that is, day-to-day expenditure on wages, pensions, benefits and consumables) exceeds its revenue from taxation and other income sources, there is a current budget deficit. If revenue exceeds expenditure there is a surplus. When the net cost of investment is also taken into account (that is, the cost of providing infrastructure and grant payments less receipts from the sale of capital assets) the difference is termed “net borrowing” or “net lending”.

## Centre for Cities

A “think tank” whose main goal is “to understand how and why economic growth and change takes place in Britain’s cities, and to produce research that helps cities improve their performance.”

## Classification of the Functions of Government (COFOG)

COFOG provides a template for allocating public expenditure into functional categories. It has been developed and adopted by the Organisation for Economic Co-operation and Development (OECD), the UN, and the EU. Expenditure is initially allocated to 10 broad service areas and then split into more granular categories. The broad categories are:

- general public services
- defence
- public order and safety
- economic affairs
- environmental protection
- housing and community amenities
- health
- recreation, culture and religion
- education
- social protection

## City region

The term is used for a metropolitan area and its hinterland. Within England, eight areas are often described as city regions. Some combined authorities include this description in their title, for example, Liverpool City Region. The term is also used for several areas in Scotland and Wales, some of which have secured devolution deals akin to those made with combined authorities in England. Funding for those deals is in part supplied by the UK government and in part by the Scottish or Welsh Government. Within Northern Ireland, references are sometimes made to a Belfast City Region.

## Combined authority

Combined authorities (CA) were originally introduced under the Local Democracy, Economic Development and Construction Act 2009 and further developed by the Cities and Local Government Devolution Act 2016.

Some have secured devolution deals, whereby the government has devolved certain responsibilities to the CA and provided funding to cover the associated expenditures.

## Council Tax

Council Tax is payable by owners and/or occupants of domestic properties to the relevant local authority. It is a devolved matter in Scotland and Wales. Local authorities are permitted to retain all of their Council Tax receipts. Northern Ireland has a broadly equivalent tax commonly known as non-domestic rates (NDR or rates).

## Country and Regional Analysis (CRA)

An annual publication by HM Treasury that is usually published around November. It is the primary source of data on expenditure by government and the broader public sector at country and regional level.

## Credit rating agencies

The three main credit rating agencies are Fitch Ratings, Moody's and Standard and Poor's. Each agency gives governments and corporations that borrow by issuing bonds or other financial instruments a specific credit rating score. These range from "AAA" down to "D", which stands for "in default". Higher ratings imply that governments can borrow more cheaply, that is, at lower rates of interest. The GLA and certain local authorities have also obtained ratings to enable them to borrow on financial markets

## Deficit and Debt return

The UK's report to the European Commission under the Maastricht Treaty showing the actual and planned deficit (net borrowing) and gross debt of central and local government.

## Digital Economy Act

The Act received the Royal Assent on 27 April 2017.

It includes clauses that promote, with various provisos, data sharing between public bodies. Moreover it should provide ONS with greater access to administrative data from across government and businesses that handle public data.

## Economic Statistics Classification Committee (ESCC)

The ESCC advises on whether, for statistical purposes, entities should be classified within or outside the public sector. Classifications may be reviewed periodically as circumstances evolve, which can result in reclassification. In formulating its recommendations, the ESSC must be guided by the requirements set out in the European System of Accounts 2010 and the most recent version of the Manual on Government Deficit and Debt.

## European System of Accounts 2010 (ESA 2010)

ESA 2010 provides the framework and rules governing the production of national accounts in each member state of the EU. Compliance is a European legal requirement. The framework is based on the wider international framework set out in the System of National Accounts 2008 (SNA 2008). ESA and the SNA differ in a number of respects to other commercial accounting standards, such as International Financial Reporting Standards (IFRS). Nevertheless, they share a requirement that financial transactions should be recorded on an accruals basis (that is, allocated to the period when there is a commitment to a transaction) rather than a cash basis (that is, allocating to the period when payment is made).

## Experimental Statistics

Experimental Statistics is a term used within the UK national statistics framework. They are statistics that are published to involve users and stakeholders in their development and as a means to build in quality at an early stage. The intention is that the statistics will subsequently reach the standards required to be designated National Statistics.

## Financial year

The UK financial year runs from the start of April to the end of March in the following calendar year. Data on the UK public sector finances is generally presented on a financial year basis. Within this scoping study, the financial year commencing April 2014 and ending March 2015 would be represented as 2014 to 2015.

## Financial Intermediation Services Indirectly Measured (FISIM)

Financial Intermediation Services Indirectly Measured (FISIM) is an estimate in national accounts of the value of the services provided by financial intermediaries, such as banks, for which no explicit charges are made. Instead, these services are deemed to be paid for as part of the margin between rates paid to savers and by borrowers. The rationale is that savers would receive a higher interest rate and borrowers pay a lower interest rate if explicit charges were applied to all financial services.

## Greater London Authority (GLA)

The GLA comprises a directly elected executive Mayor of London, plus an elected 25-member London Assembly with scrutiny powers. The authority was established in 2000 and derives most of its powers from the Greater London Authority Act 1999 and the Greater London Authority Act 2007.

## Government Expenditure and Revenue Scotland

An annual publication that shows the expenditure, revenue and net fiscal balance attributable to Scotland.

## Greater Manchester Combined Authority (GMCA)

The GMCA brings together 10 local authorities: Bolton, Bury, Manchester, Oldham, Rochdale, Salford, Stockport, Tameside, Trafford and Wigan.

## Gross domestic product (GDP)

GDP is a monetary measure of the market value of all final goods and services produced over a given period. Market values reflect any taxes or subsidies on products. ONS publishes annual estimates in Blue Book.

## Gross operating surplus (GoS)

In national accounts, GoS is the value of gross output less the cost of intermediate goods and services (to give gross value added), and less compensation of employees. It is broadly analogous to profits shown in company accounts but differs in some important respects.

## Gross value added (GVA)

Gross value added is the monetary value of final output with any taxes or subsidies on product removed.

The relationship between GDP and aggregate level GVA is:

GDP equals GVA plus the value of any taxes on products, less the value of any subsidies on products.

## Housing revenue account (HRA)

The housing revenue account (HRA) is an account of expenditure and income that every local housing authority must keep. The account is kept separately or ring-fenced from other council activities.

## Institutional sectors

Institutions residing within an economy are allocated to one of the following sectors: households; general government; financial corporations; non-financial corporations; not for profit organisations serving households. Non-resident units that interact economically with resident units comprise the “rest of the world” sector. In some instances, the higher-level sectors may be further subdivided. Therefore, general government can be separated into central and local government, while corporations that are owned and/or controlled by government are categorised more specifically as public corporations. Public corporations are classified more specifically as either public non-financial corporations, such as British Nuclear Fuels plc, or as public financial corporations, such as the Export Credits Guarantee Department or the Royal Bank of Scotland.

## Local authority districts (LADs)

For the UK as a whole, these comprise:

- 11 districts of Northern Ireland
- 22 unitary authorities within Wales
- 32 unitary authorities within Scotland
- 36 metropolitan boroughs, 32 London boroughs, 201 non-metropolitan districts, and 55 unitary authorities within England, plus the City of London and the Isles of Scilly

## Local enterprise partnership (LEP)

Their purpose is to shape local economic priorities and promote economic growth and job creation. By March 2016, £7.3 billion of Growth Deal funding had been allocated to LEPs and the 2016 Autumn Statement confirmed that the government would increase this by a further £1.8 billion.

## Local Growth Fund

The Local Growth Fund is government funding awarded to local enterprise partnerships (LEPs) for projects that benefit the local area and economy. The first wave of Growth Deals was announced in July 2014.

## Lower layer super output areas (LSOAs)

LSOAs were part of a hierarchical geography established for the 2011 UK Population Census. Typically they cover populations of between 1,000 and 1,500 residents.

## Maastricht Treaty

The Maastricht Treaty, also known as the Treaty on European Union, is the treaty responsible for the creation of the EU. It was signed on 7 February 1992 and reflected the intention of member states to create a common economic and monetary union. It made the reporting of government finances to the European Commission in the form of a deficit and debt return obligatory.

## Manual on Government Deficit and Debt (MGDD)

The MGDD supplements the information provided in the ESA 2010 Manual, providing additional guidance on matters relating to classifications of entities and transactions.

## New Economy

New Economy delivers policy, strategy and research on behalf of the Greater Manchester Combined Authority and the Greater Manchester Local Enterprise Partnership. It plays a significant role in evaluation, evidence base, work and skills, statutory spatial framework, and business support.

## Non-domestic rates (NDR)

NDR, or business rates, is a property tax paid by the owner-occupier or tenant of a non-domestic property and is a devolved matter in Scotland and Wales.

## NUTS

The Nomenclature of Units for Territorial Statistics (NUTS) is the statistical geographies used within the EU. See Annex 1 for details.

## Office for Budget Responsibility (OBR)

The Office for Budget Responsibility was created in 2010 to provide independent and authoritative analysis of the UK’s public finances. Its responsibilities include economic and fiscal forecasting, and evaluating UK government performance against its fiscal targets.

## Precepting

A precepting authority is one with the power to instruct another local authority (the billing authority) to collect an amount from Council Tax on its behalf. Precepts are shown as separate elements on Council Tax bills.

Major precepting authorities cover territory larger than that of the billing authority (so they actually issue precepts to more than one billing authority). They include: county councils (other than those which are unitary authorities); police authorities; metropolitan county fire and civil defence authorities; combined fire and rescue authorities; and the Greater London Authority. Scottish Water is the only public corporation in the UK that derives some of its revenue via a precept on Council Tax receipts (in its case, on receipts from all billing authorities in Scotland).

## Private finance initiative

Private finance initiatives (PFIs) are a form of public-private partnership (PPP), first introduced in 1992. Under a PFI, the private sector will typically design, build, finance and maintain infrastructure facilities under a long-term contract. The public sector body that uses the infrastructure repays the debt over a long period, often 25 to 30 years. As at 31 April 2017, there were 740 current PFI projects across central, local, and devolved government with a capital value of £60 billion.

## Public corporations

These are bodies that the Economic Statistics Classification Committee has deemed: to be within the public sector, as they are at least part owned and are subject to a substantial degree of control by central and/or local government; and to be within the market sector, which implies that they sell products at economic prices and derive a substantial amount of their income from this source.

## Public-private partnership (PPP)

The term “public-private partnerships” (PPPs) is widely used for many different types of long-term contracts between government and corporations for the provision of public assets. In public-private partnerships, government agrees to buy services from a non-government unit (a partner) over a long period of time, resulting from the use of specific “dedicated assets”, which the non-government unit builds to supply the service. The asset is usually used for the provision of public services, such as in the domain of health (hospitals), education (schools and universities), and public security (prisons) or in the context of transport and communication structures.

## Regional Development Agency (RDA)

The RDAs operated in each of the nine English regions from 1998 until 2012 when, with the exception of the Greater London Authority, they were abolished. The RDAs had been charged with the development of regional economic strategies and innovation strategies. Their programmes and initiatives were funded by HMT via a group of central government departments. From 2007, each RDA could call upon a small team provided by ONS and based within the region, to assist in obtaining access to regional and sub-regional data sources.

The strategy underlying the creation of the RDAs envisaged that they would, to some extent, be accountable to elected regional assemblies. However, while regional assemblies were created, their members were not elected but appointed. Approximately two-thirds of members were council members drawn from local authorities within the region, while the remaining third comprised representatives of various interest groups. The only exception was Greater London where assembly members were, and continue to be, elected by the general public.

## Scottish Rate of Income Tax (SRIT)

The SRIT came into operation in the financial year commencing April 2016. The UK income tax rates (basic, higher and additional rates), paid by Scottish taxpayers has been reduced by 10 percentage points (10p in the pound) with the Scottish Parliament able to set the level of income tax above this base rate. The Scottish rate is set annually by the Scottish Parliament at any value it deems appropriate, on a scale running from 0% upwards in half percentage points. For 2016 to 2017, SRIT has been set at 10%, so taxpayers resident in Scotland are subject to the same overall rates of personal income tax as those residing in the rest of the UK in the first year of operation of the new system.

### Standard Industrial Classification 2007 (SIC 2007)

The UK Standard Industrial Classification 2007 is currently used for classifying business establishments and other statistical units according to the type of economic activity in which they are engaged, that is, what they produce. It is a hierarchical system that encompasses broad categories that are subdivided into more granular components; for example, SIC group 64.1 (monetary intermediation) is a subset within the broader SIC section K (financial and insurance activities).

### West Midlands Combined Authority (WMCA)

The constituent authorities for the West Midlands Combined Authority are:

- Birmingham City Council
- City of Wolverhampton Council
- Coventry City Council
- Dudley Metropolitan Borough Council
- Sandwell Metropolitan Borough Council
- Solihull Metropolitan Borough Council
- Walsall Council.

The West Midlands Combined Authority covers a three LEP geography and each of the LEPs has joined the WMCA as a non-constituent member. They comprise: the Black Country LEP, Coventry and Warwickshire LEP, and Greater Birmingham and Solihull LEP.

## 11 . Annex 1: NUTS and other statistical geographies

The Nomenclature of Units for Territorial Statistics (NUTS) regulation was created by the European Office for Statistics (Eurostat) and is a hierarchical classification of geographical units that make up the territory of the EU. This enables the production of regional statistics, which are comparable across the EU.

The main purpose of the NUTS classification is to provide a framework for the collection and publication of standardised statistical information, which is used both for analysis and as the framework for European policy initiatives. NUTS is instrumental in the EU’s Structural Fund delivery mechanisms, which aim to reduce regional disparities in income, wealth and opportunities.

The NUTS regulation recommends broad minimum and maximum population thresholds for the size of the NUTS regions:

- NUTS1 population: between 3 million and 7 million
- NUTS2 population: between 800,000 and 3 million
- NUTS3 population: between 150,000 and 800,000

For statistical purposes, the UK has allocated countries, regions and sub-regional areas within the three levels as follows:

- NUTS1: Wales, Scotland, Northern Ireland and the nine English regions (the North East, the North West, Yorkshire and Humberside, the East Midlands, the West Midlands, East England, South East England, South West England, and Greater London)
- NUTS2: 40 sub-regions – mainly groups of counties and unitary authorities
- NUTS3: comprises173 local areas – principally individual counties and unitary authorities

It should be noted that Northern Ireland is both a NUTS1 and a NUTS2 entity, with groupings of districts making up the five NUTS3 units within Northern Ireland. NUTS entities often do not correspond to administrative entities, but are rather groupings of neighbouring local councils or authorities.

In practice, it is also desirable and necessary to use lower levels of areal geography than the NUTS3 level. Examples of these in the UK include LAU level 1, also referred to as local authority districts (LADs). LAU1 level entities comprise individual local authorities that are intrinsically administrative units. Hence this categorisation includes all districts within Northern Ireland, unitary authorities within Scotland, Wales and England, together with metropolitan districts and non-metropolitan districts in England, and London boroughs.

By combining data estimates for individual LADs it is possible to generate estimates for groupings such as combined authorities, local enterprise partnerships (LEPs) and city regions. It should be noted that LEPs are allowed to overlap so a local authority is permitted to be part of more than one local enterprise partnership. Care should be taken to avoid double counting.

## 12 . Annex 2: Summary of revenue methodology and data sources used by Centre for Cities with additional commentary and comparisons

This Annex provides more details regarding the data sources and methodologies used by Centre for Cities than is available in its “Mapping Britain’s public finances: where tax is raised, and where it is spent” publication. As these methods and sources are for quite a number of taxes radically different to those that have typically been used to produce estimates at NUTS 1, it is quite instructive to compare them with those used for other publications; in particular, those used by New Economy in its ESPRESSO tool and ONS in the Country and regional public sector finances bulletin.

**Annex 2**

| Revenue | Centre for Cities methodology and data sources | Comments and comparisons |
| --- | --- | --- |
| Personal Income Tax (PIT) | Our Annual Survey of Hours and Earnings (ASHE) provides an estimate of average (mean) gross pay per employee in each local authority district (LAD). From this, the average tax paid per employee was estimated using information on personal tax allowances. Multiplying by the number for employment in the LAD, sourced from the Business Register and Employment Survey, provided an initial estimate of total tax take from earnings for each LAD. To these, residence-based estimates of taxes paid on pension income were added (HM Revenue and Customs (HMRC) publishes at LAD level estimates of numbers in receipt of pensions and the average incomes from those pensions), to arrive at total tax on all sources of income for each LAD. These totals were then adjusted using a scaling factor, such that the overall total over all LADs sums to the overall total recorded by HMRC. | Centre for Cities has adopted a workplace based approach. This contrasts with the residence-based approach used in the Country and Regional PSF bulletin which derives estimates from HMRC's Survey of Personal Income (SPI). New Economy has adopted a similar approach to Centre for Cities but indicated that it might revert to residence based estimates. For certain LADs in some years the ASHE data has been suppressed as "statistically unreliable". To arrive at an estimate the result for an adjacent year or years may be used, for example, if 2014 is suppressed, use 2013 or 2015 data, or preferably a simple average of both years. Results for the Isles of Scilly are always suppressed as statistically unreliable and/or disclosive. ASHE does not cover self-employment. A case could be made for using HMRC data on tax collected from self-employment on a residence basis to arrive at an estimate of PIT paid by the self-employed (as it does to estimate PIT paid on pension income). While New Economy and the Black Country Economic Intelligence Unit (EIU) have adopted a similar approach, the latter ignores income tax receipts from pension income. New Economy also constrains estimates against country level totals provided in HMRC's A Disaggregation of HMRC tax receipts (DOTR) publication, rather than solely against the UK total. |
| Capital Gains Tax (CGT) | Regional (NUTS1) CGT totals published by HMRC were apportioned to local authority level using LADs' estimated shares of regional gross value added (GVA). As no estimates of GVA at LAD level were available to Centre for Cities, estimates were derived from NUTS3 data and apportioned to constituent LADs using Business Register and Employment Survey (BRES) employment data as an indicator. | The Country and regional PSF bulletin utilises the same HMRC source to obtain NUTS1 estimates. Centre for Cities' apportionment method is analogous to that used to apportion CGT to Northern Ireland in the Northern Ireland Net Fiscal Balance Report (NINFBR). The EIU adopts a similar approach. New Economy apportions regional totals using LAD mid-year population estimates (MYEs). |
| Corporation Tax (Onshore) | Total UK Corporation Tax (CT) receipts from HMRC were initially apportioned on a regional basis according to regional share of national gross operating surplus (GoS), and then to local level according to local authority share of regional GVA. Data sources comprised HMRC receipts, ONS GoS, ONS regional GVA and the Business Register and Employment Survey. | No breakdown was undertaken into onshore and offshore components. The Country and regional PSF bulletin uses HMRC disaggregated data specifically for onshore Corporation Tax receipts, but converts these to an accrual basis. Centre for Cities would likely have used GoS at NUTS3 level for apportionment had it been available at the time. ONS regional accounts first published GoS at NUTS3 in 2015. New Economy use mid-year estimates (MYEs) to apportion to LADs constraining to country level totals provided in the DOTR publication. |

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| Corporation Tax (Offshore) | Not considered separately by Centre for Cities. | Not separately identified by Centre for Cities. The Country and regional PSF bulletin, in accordance with the DOTR and Government Expenditure and Revenue Scotland (GERS) publications, is publishing two sets of estimates for offshore CT, based on a geographic basis (that is, the location of oil and gas fields) and on population shares respectively. New Economy use MYEs to apportion to LADs constraining to country level totals provided (on a geographical basis) in the DOTR publication. |
| Bank Levy | By multiplying regional level estimates of GVA per workforce job in Section K of Standard Industrial Classification 2007 (financial and insurance activities), published by GLA Economics, by estimates of employment in Section K available from BRES, initial estimates of GVA for Section K at LAD level were obtained. These estimates were then used to apportion HMRC country level data on Bank Levy receipts to LADs. | This broadly mirrors the approach used in HMRC's DOTR publication, which is unable to utilise administrative data identifying origins of receipts due to disclosure concerns. A possible modification of Centre for Cities' approach would be to use BRES data on a LAD level for employment in SIC group 64.1 (monetary intermediation) rather than the broader SIC sector K. New Economy used estimates of employment in Sector K to apportion to country totals provided in the DOTR. The Country and regional PSF bulletin uses data from ONS regional accounts on banks and building societies income from fees, commission and financial intermediation services indirectly measured (FISIM) to apportion total receipts to regions. |
| Bank Payroll Tax | Not considered by Centre for Cities. | This tax was only applicable in fiscal year 2010 to 2011 and so was not considered by Centre for Cities or New Economy. |
| Swiss Capital Tax | Total UK Swiss Capital Tax from published HMRC receipts was apportioned using local authority share of households in the upper quartile of total household wealth nationally as an indicator. ONS Wealth and Assets Survey is the source for this indicator. | Disclosure concerns preclude the use of HMRC administrative data, which could otherwise provide highly precise estimates at lower-level geographies. Population shares (ONS mid-year estimates) are used for apportionment in DOTR, GERS and NINFBR. New Economy use MYEs to apportion to LADs constraining to country level totals provided in the DOTR publication. |
| National Insurance contributions (NICs) | Total UK NICs were apportioned to local level using scaling coefficients derived from Centre for Cities' Income Tax calculations. Sources comprised: HMRC receipts, ONS Annual Survey of Hours and Earnings, and the Business Register and Employment Survey. | THE EIU adopts a similar approach. New Economy use MYEs to apportion to LADs constraining to country level totals provided in DOTR publication. |

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| Value Added Tax | HMRC's receipts of VAT were initially apportioned to NUTS1 countries and regions on the basis of average household expenditure per region provided in the annual ONS Family Spending (FS) publication, multiplied by the estimated numbers of households derived from the Labour Force Survey. Regional expenditure was then disaggregated into 16 expenditure categories using the FS publication. Regional spend within each of these categories was then apportioned to individual LADs, using one of several possible indicators. These include: employment derived from BRES within a relevant SIC code, for example, within 54.11 for expenditure on new motor vehicles; fuel consumption data from Department of Energy and Climate Change (DECC) to apportion expenditure on petrol, diesel and other fuels; GVA to apportion inter-alia rail and tube fares; and population for categories such as internet subscription fees. | Centre for Cities' approach focuses almost exclusively on spending by the household sector, which accounts for over 70% of VAT receipts Spending by Government is not analysed. This approach is similar to that adopted for GERS, but unlike GERS does not take into account VAT refunds to local and central government nor make an accruals adjustment. The Country and regional PSF bulletin broadly mirrors HMRC's approach for its DOTR publication of incorporating VAT estimates for three additional sectors, for example, the government sector, the housing sector and the VAT exempt sector (while no VAT is payable on the outputs for this sector, VAT will have been paid on inputs). New Economy use MYEs to apportion to LADs constraining to country level totals provided in the DOTR publication. |
| Stamp Duties | Total UK Stamp Tax on shares was apportioned to local level using LADs' estimated shares of national GVA (see Capital Gains Tax for method of estimating GVA for LADs). Stamp Duty Land Tax generated within each LAD is published by HMRC. | A fundamentally different approach is used for apportionment of Stamp Tax on shares in the Country and regional PSF bulletin, which apportions on the basis of the locations of FTSE 100 companies. ONS regional accounts has published estimates of GVA at LAD level for English authorities and is working towards publishing corresponding estimates at district and unitary authority level for the other countries of the UK. New Economy use MYEs to apportion to LADs constraining to country level totals provided in DOTR publication. |
| Inheritance Tax | Total UK Inheritance Tax was apportioned to local level using local authority shares of total inheritance tax payers, apportioned from NUTS3 level data using LAD population estimates. Sources comprised HMRC Inheritance Tax data published at NUTS3 level and ONS mid-year population estimates. | New Economy use MYEs to apportion to LADs constraining to country level totals provided in DOTR publication. |
| Fuel Duties | Total UK Fuel Duties, published in HMRC's Hydrocarbon Oils Bulletin were apportioned to local level using LADs' shares of total road fuel consumption, which are published by DECC. | The methodology is broadly consistent with that used for the Country and regional PSF bulletin, the DOTR and GERS. New Economy use MYEs to apportion to LADs constraining to country level totals provided in DOTR publication. |

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| Tobacco Duties | Total UK Tobacco Duties shown in HMRC's Tobacco Bulletin were apportioned to local level according to local authorities' shares of jobs in tobacco production for domestically manufactured items, and using shares of GVA for imported items. | Centre for Cities adopts a production- and workplace-based approach. This contrasts with the consumption-based approach used for DOTR, GERS and NINFBR, which involves the following procedure. Average weekly household expenditure on tobacco (from ONS' Living Costs and Food Survey (LCF)) is weighted to the number of households in the relevant country to estimate total weekly expenditure. The country/UK ratio is then applied to apportion UK total receipts. The Country and regional PSF bulletin uses LCF estimates at regional level for apportionment. For England, New Economy uses estimates of average household expenditure on tobacco in each LAD (from ONS' Living Costs and Food Survey (LCF)). These are weighted using mid-year LAD population estimates (MYEs). Total receipts for England from the DOTR are then apportioned using the weighted expenditures. For the other countries, New Economy use MYEs to apportion to LADs constraining to country level totals provided in DOTR publication. |
| Alcohol Duties | Total UK Alcohol Duties were apportioned to local level according to local authority shares of jobs in spirits, beer and cider, and wine production for domestically produced, and GVA for imported products. Sources comprised: HMRC Alcohol bulletin, Business Register and Employment Survey, ONS regional GVA, NOMIS mid-year population estimates | Centre for Cities adopts a production-based and workplace-based approach. DOTR, GERS and NINFBR use a consumption-based approach analogous to that used to apportion Tobacco Duty. The Country and regional PSF bulletin uses estimates of consumption of relevant types of alcohol extracted from the Department for Environment, Food and Rural Affairs (DEFRA) Family Food publication, for which the underlying data is derived from the LCF. Due to volatility in the consumption time series, the series are smoothed using moving averages. For England, New Economy uses estimates of average household expenditure on spirits, beer and cider, and wine in each LAD (from ONS' Living Costs and Food Survey (LCF)). These are weighted using mid-year LAD population estimates (MYEs). Total receipts for England from the DOTR are then apportioned using the weighted expenditures. For the other countries, New Economy use MYEs to apportion to LADs constraining to country level totals provided in DOTR publication. |
| Betting and Gaming Duties | Total UK Betting and Gaming taxes were apportioned to local level using either jobs in the betting and gaming industry, or LCF consumption data for population driven betting and gaming activities. Sources comprised: HMRC Betting and Gaming bulletin, Business Register and Employment Survey, and mid-year population Estimates. | Centre for Cities adopts a hybrid production- and workplace-based approach combined with a consumption- and demand-based approach. The Country and regional PSF bulletin, DOTR, GERS and NINFBR use a consumption-based approach analogous to that used to apportion Tobacco Duty. New Economy replicates its methods for apportioning duties on tobacco and alcohol. |
| Insurance Premium Tax | Total UK Insurance Premium Tax was apportioned to local level using local authority share of jobs in the relevant jobs in insurance activities liable for the tax. Sources comprised: HMRC Insurance Premium Tax bulletin and the Business Register and Employment Survey. | Centre for Cities adopts a production or workplace based approach. The Country and Regional PSF bulletin, DOTR, GERS and NINFBR use a consumption based approach analogous to that used to apportion tobacco duty. New Economy replicates its methods for apportioning duties on tobacco and alcohol. |

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| Air Passenger Duty (APD) | Total UK APD was apportioned to LADs using airport and local authority shares of total passenger numbers as indicated by Civil Aviation Authority (CAA) data. Sources comprised: HMRC APD bulletin and Civil Aviation Authority airport passenger numbers. | APD is a complex tax that varies depending on passengers' destination bands and three classes of travel. DOTR use various surveys conducted by CAA and ONS International Passenger Survey (IPS) to derive estimates for DOTR. For GERS, CAA data for Scottish airports and Scottish transport statistics were important inputs for the GERS estimates of APD for Scotland. The Country and regional PSF bulletin employs a similar approach to that used for the DOTR, but employs additional data from the IPS. For NINFBR UK total APD was apportioned to Northern Ireland as per its population share. |
| Landfill Tax | Total UK Landfill Tax was apportioned to local level using local authority share of English, Welsh and Scottish total waste sent to landfill and share of relevant jobs in waste disposal activities liable for the tax. Sources comprised: HMRC Landfill Tax bulletin, DEFRA local authority collected waste, Stats Wales, Scottish Environment Protection Agency and the Business Register and Employment Survey. | Centre for Cities adopts a production- and workplace-based approach. Sources used for DOTR, GERS and NINFBR comprise: the Northern Ireland Municipal Waste Management Statistics, the Scottish Environment Protection Agency and the Environment agency for England and Wales. Landfill Tax receipts are apportioned by the same proportion as the tonnages sent to landfill for each sub-UK area. The Country and regional PSF bulletin is broadly consistent with the approaches used for DOTR, GERS and NINFBR. From April 2015, Landfill Tax was devolved to Scotland, so data for the Scotland Landfill Tax is now provided by Revenue Scotland. Estimates in the bulletin for Wales for recent years utilise Office for Budget Responsibility (OBR) forecasts, which in turn are based on analyses by the Welsh Government. |
| Climate Change Levy | Total UK Climate Change Levy receipts were apportioned to local level using local authority share of relevant jobs in activities liable for the tax, that is the supply of electricity, gas, and solid fuel. | Centre for Cities adopts a production- and workplace-based approach. DOTR and GERS estimates were derived from DECC data on sub-national fuel consumption. The Country and regional PSF bulletin principally uses consumption data published by the Department for Business, Energy and Industrial Strategy (BEIS). |
| Aggregates Levy | Total UK Aggregates Levy was apportioned to local level using local authority share of relevant jobs in activities liable for the tax. Sources comprised: HMRC Aggregates Levy bulletin and the Business Register and Employment Survey. | Centre for Cities uses employment as a proxy for production. Data from the UK Minerals Yearbook, published by the UK Geographical Survey, is used to calculate the tonnage of crushed rock, sand and gravel mined in each sub-UK area for DOTR and GERS estimates. For NINBR, the UK total was apportioned to Northern Ireland according to its share of GVA. The Country and regional PSF bulletin also principally uses data from the UK Minerals Yearbook, but supplements this with data from the Mineral Extraction in Great Britain Business Monitor PA1007. |
| Vehicle Excise Duty | Not considered by Centre for Cities. | Northern Ireland vehicle excise duty (VED) estimates published in the NINFBR annual reports were based on data supplied by the Driver and Vehicle Licensing Northern Ireland (DVLNI). GERS estimates are based on DVLA information concerning total value of licences for Scotland. The Country and regional PSF bulletin derives a Great Britain VED total by subtracting the Northern Ireland value from the UK total. The Great Britain total is then apportioned to countries and regions using numbers of licensed vehicles provided in the Department for Transport's Vehicle licensing statistics publication. New Economy apportions data on DVLA receipts from its annual accounts using Department for Transport's Vehicle licensing statistics, which are available at local authority level. |

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| Customs Duties | Total UK Customs Duties were apportioned to the local level according to local authority share of national GVA. Sources comprised: HMRC Receipts, ONS Regional gross value added and the NOMIS mid-year population estimates. | Receipts from Customs Duties are apportioned in line with sub-UK GVA. Since Customs Duties are collected by HMRC on behalf of the EU, they do not form part of the UK public sector finances. |
| National non-domestic rates | Centre for Cities uses local authority level data published by the Department for Communities and Local Government (DCLG) and devolved administrations. | The Country and regional PSF bulletin uses the same data sources and aggregates local authority level data to regions. |
| Council Tax | Centre for Cities uses local authority level data published by DCLG and devolved administrations. | The Country and regional PSF bulletin uses the same data sources and aggregates local authority level data to regions. |
| Other taxes, Other taxes on income and Wealth and other taxes and royalties | Not considered by Centre for Cities. | These comprise a number of taxes that for the most part generate relatively small amounts of receipts. Examples include: the collection by the Horserace Betting Levy Board (HBLB) of a statutory levy from horseracing bookmakers; Vehicle Registration Tax payable when registering and taxing a vehicle for the first time with DVLA; and passport fees. Receipts from these other taxes are included in the public sector finances. Totals are apportioned in GERS and the Country and regional PSF bulletin using a range of methods. One tax within this category that is included in New Economy's ESPRESSO model is the TV licence fee, which raises annual revenue of around £3.7 billion. New Economy apportions these receipts using LAD population MYEs. The Country and regional PSF bulletin apportions to regions using estimates of numbers of households within NUTS1 areas. |
| Interest and dividends | Only partially included by Centre for Cities, which apportions national level data for local government to individual authorities. | The Country and regional PSF bulletin uses more comprehensive data relating to general government and public corporations held in ONS databases that underlie the public sector finances. New Economy does not include interest and dividends explicitly in its ESPRESSO model. |
| Gross Operating Surplus (GoS) | Not considered by Centre for Cities. | GoS comprises operating (or trading) surpluses (or losses) resulting from central government, local government and public corporation trading activity. By convention, in national accounts GoS for general government is equal in value to its consumption of fixed capital. The Country and regional PSF bulletin apportions to regions using estimates of non-market capital consumption published in ONS regional accounts. For public corporations the apportionment of GoS is quite complex, with different methods being applied to different elements that make up GoS in the Country and regional PSF bulletin. |

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| Rent and other current transfers | Not considered by Centre for Cities. | In the context of national accounts, rent refers to income payable for the use of a natural resource. Natural resources include land, mineral rights, forestry rights, water, fishing rights, air space and electromagnetic spectrum. Therefore rent is different to rental, which is payment for the use of residential or commercial property. The Country and regional PSF bulletin apportions data relating to rent and current transfers for general government and public corporations held in ONS databases that underlie the public sector finances. For central government, revenues from spectrum use in relation to licences for 3G and 4G mobile phone use are an important element of rent. Court fines are an example of current transfers. Indicators used to apportion national level data include public sector regional GVA and overall regional GVA. New Economy does not include rent and other current transfers explicitly in its ESPRESSO model. |

# 13 . Annex 3: Estimates of tax receipts from Personal Income Tax

Table A illustrates how much more precise estimates of receipts from Personal Income Tax (PIT) are for larger local authorities or combined authorities, compared to those with considerably smaller populations.

**Table A: Estimates of tax receipts from PIT for selected local authorities and combined authorities, derived from the Survey of Personal Incomes**

| Authority | Number of taxpayers (thousands) | | | Average (mean) tax paid (£) | | |
|---|---|---|---|---|---|---|
| | Lower 95% Confidence Limit | Central Estimate | Upper 95% Confidence Limit | Lower 95% Confidence Limit | Central Estimate | Upper 95% Confidence Limit |
| Greater Manchester CA | 1130 | 1150 | 1170 | 3710 | 3820 | 3930 |
| Birmingham | 374 | 386 | 397 | 3530 | 3670 | 3800 |
| Cheshire East | 200 | 208 | 216 | 6260 | 6700 | 7150 |
| Halton | 53 | 57 | 62 | 2960 | 3270 | 3580 |
| Craven | 24 | 27 | 30 | 4310 | 5120 | 5930 |
| Rutland | 18 | 21 | 23 | 5280 | 6630 | 7980 |
| West Somerset | 13 | 15 | 18 | 2,400 | 4,300 | 6,200 |
| City of London | 8 | 9 | 11 | 40800 | 51300 | 61700 |

| | Estimated total receipts (£ million) | | | |
|---|---|---|---|---|
| | Lower estimate | Central Estimate | Upper estimate | % difference between central and upper/lower estimate |
| Greater Manchester CA | 4280 | 4410 | 4540 | 3 |
| Birmingham | 1360 | 1410 | 1470 | 4 |
| Cheshire East | 1300 | 1400 | 1490 | 7 |
| Halton | 168 | 187 | 207 | 11 |
| Craven | 116 | 139 | 161 | 17 |
| Rutland | 109 | 136 | 163 | 20 |
| West Somerset | 37 | 66 | 95 | 44 |
| City of London | 395 | 484 | 573 | 18 |

Source: Office for National Statistics