

The impact of supranational conferences on their host economies: the case of Glasgow, Scotland

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Abstract

Universities are known to be important in supporting economic activity in their host cities and regions. Their role in attracting business tourism has been less studied. This paper uses an extended Input-Output framework to provide empirical estimates of the tourism impacts on both the city and Scottish economy arising from international conference activities in Glasgow associated with the city's three universities (University of Glasgow, Glasgow Caledonian University and the University of Strathclyde).

An integrated Input-Output and gravity modelling framework is used to provide Gross Value Added (GVA) and employment impact estimates for Scotland, the city of Glasgow and for communities across Glasgow based on UK parliamentary constituencies. The study uses visitor data collected from the universities and the Glasgow Convention Bureau.

This paper considers the relative social value of impacts from Glasgow's university associated international conferences. The social value of impacts reflects the dimensions of inclusive growth, including income distribution and deprivation, as recently set out by the Scottish Government. The values are considered for the communities of Glasgow and conclusions drawn.

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International conferences

Considerable attention has been paid to the economic impact of international conferences and Meetings, Incentives, Conferences and Exhibitions (MICE) on their host economies. In cities across the globe, city convention centres and bureaux are dedicated to the attraction of MICE activities to their localities.

A wide range and breadth of MICE activities have been included in previous analyses. A review of different definitions adopted for MICE activities (NBTC, 2015) set out that the World Tourism Organization (WTO) described a meeting a ten or more people meeting for a minimum duration of four hours. Other organisations offered more flexible definitions of meetings.

Incentive travel uses travel experiences to reward or motivate workers. The focus of incentive programmes is often on leisure activities and the use of incentive trips varies significantly across countries.

Definitions of international conferences also varied considerably with some tourism organisations only recognising international conferences as those organised by associations (for example, the International Input-Output Association). Other tourism organisations also recognise international conferences organised by government bodies, corporations and other organisations. VisitBritain currently (April 2019) defines an international conference held in the UK as one where at least 50% of the delegates are from outside the UK.

Supranational conferences

This paper identifies and analyses the economic role of a distinct subset of supranational conferences. Supranational conferences are a global phenomenon, with two key features:

- (a) international mobility, regularly rotating among different countries; and
- (b) a captive participant base of subject specialists who usually travel with the conference to its different destinations.

The concept of supranational as distinct from international is applicable to a wide range of events, not solely conferences. To give an example, the Edinburgh Festival is an *international* event, attracting participants, sponsors and audiences from around the world. However, the FIFA' World Cup is a *supranational* event, moving from country to country, bringing participants, sponsors and spectators with it.

Analogous to cruise ships, supranational conferences drop anchor at different destinations annually, biennially or triennially. The conferences plug in to the faculties and infrastructure of the host location before lifting anchor and moving to a new location for the next meeting. The expenditure associated with each conference represents an injection into the host economy.

In analysing the local economic impact, we adopt a hypothetical extraction approach, justified by the global mobility of the supranational conference and by its relatively self-contained participant or delegate base. As supranational conferences are typically highly specialised in subject matter or professional affiliations, they attract a specific following – delegates often travel with the conference from country to country reflecting their interest as a member of that specialist grouping.

For this reason, all expenditure associated with supranational conferences is treated as wholly additional, occurring only because of the conference's presence in the host city². The spending of local host country participants is not separated from delegates outside of the host country.

All delegates are treated as part of the 'travelling conference ship' as the delegates and their spending travels with the conference. This year's local delegates will be next year's non-local delegates in another country. It can be noted that at the other extreme, for a purely local event, displacement would normally be assumed to be close to 100%.

The case of Glasgow, Scotland

Modelling approaches commonly used to measure the economic impacts of tourism and events activities have included Input-Output models, Computable General Equilibrium (CGE) models and Tourism Satellite Accounts (TSAs). A review of the different modelling approaches set out that *"In common with tourism in general, MICE happens not in countries but in places – largely in cities – and it is at this spatial scale that many relevant policy decisions arise."* (Jones and Li, 2015). The review highlighted some of the difficulties involved in estimating economic significance of MICE at a local level.

² H. M. Treasury's Green Book sets out the components of additionality. Some of these components are taken into account in this paper including leakage. Supranational conferences may be considered wholly additional in terms of the deadweight effect being close to zero, driven primarily by the attendance of international delegates. The displacement effect is also close to zero given recent significant investment in accommodation and facilities including the Scottish Event Campus and the Technology & Innovation Centre (University of Strathclyde).

Our case study is on the example of supranational conferences taking place in Glasgow during 2018. An extended Input-Output framework was used to show how the impact generated by these globally mobile events percolates across Glasgow as a city and across Scotland as a whole.

The distribution of economic impacts across Scotland was analysed at local authority level. Within Glasgow the distribution of economic impacts was analysed across the city's seven UK parliamentary constituencies.

Data sources and definitions

The Glasgow Convention Bureau provided data on all 2018 conference activity. In 2018 the Bureau reported providing support for 619 conferences and business events in Glasgow, involving 167,336 participants over 396,987 delegate days. From the data provided a subset of conferences was identified with the specific characteristics that met the criteria for a supranational conference.

The International Congress and Convention Association (ICCA) definition of an international association conference was used to select conferences. In addition to being affiliated to an international association or learned society the conferences:

- (a) must take place on a regular basis (typically annually, biennially or triennially);
- (b) rotate between a minimum of three countries; and
- (c) host at least fifty participants.

Additional criteria applied were that the selected conferences lasted for at least two days with the main venues within the Glasgow City Council (local authority) boundary. This resulted in the identified subset of 'supranational' conferences shown in Figure 1. A full list of the 44 supranational conferences is appended (Figure A.1).

Figure 1: Supranational conferences in Glasgow

Summary of 2018 Conferences	
Number of conferences	44
Number of delegates	28,305
Number of delegate days	125,695

Source: Glasgow Convention Bureau

Expenditure associated with the supranational conferences was derived from two components; individual delegate expenditure and associated conference organiser expenditure.

Estimates of the two components drew on a number of UK expenditure surveys of conference delegates and international visitors and information published by tourist boards and convention bureaux. These include the International Passenger Survey (IPS) and research commissioned by the Meeting Professionals International (MPI) Foundation (Li et al, 2013).

The average personal expenditure of delegates to Supranational conferences in Glasgow was estimated to be £165.60 per day, excluding registration fees. A summary of Glasgow's supranational conference expenditure in 2018 is shown in Figure 2. Total expenditure was £40.0m.

Figure 2: Supranational conference expenditure 2018

Expenditure item	£m
Delegate expenditure	£20.2
Conference organisation expenditure	£20.8
Total expenditure	£40.0

Source: Glasgow Convention Bureau

This is broadly comparable to estimates across a number of international studies³. Comparisons between different estimates are challenging due to the varying conditions, definitions of conference activities and the types of expenditure included.

The importance of universities

Of the 44 identified supranational conferences, 41 involved scientific, research or practitioner specialists. Most of these conferences had a local university-based ambassador who played a key role in attracting the conference to Glasgow.

³ An Association of Australian Convention Bureaux (AACB) report showed general conference visitors spending A\$236 per day (AACB, 2014), personal expenditure only. A Fáilte Ireland briefing in 2017, based on recent survey results, showed each business tourism delegate was worth up to €1,643. A 2017 survey undertaken by VisitBritain showed an average spend of £1,021 per delegate (including conference registration fees).

Only three of the identified conferences were non-academic in nature, although they still had a specialist focus. All three were conventions of global charities, for example the World Downs Syndrome Congress. At least one of the three conventions was supported by a university ambassador.

The impact of Glasgow's supranational conferences

The direct economic activity of supranational conferences spreads through the local economy and further afield. Spending generated by the conferences is recycled to suppliers and employees. These indirect impacts are then further amplified as suppliers and employees and government generate further economic activity across the country.

Using a model of the Scottish economy published by the Scottish Government, these flows can be measured to show how the various types of spending link together with other parts of the economy to estimate the conference's overall impact. The Scottish Government publish multipliers for turnover (output), Gross Value Added (GVA), income and employment. The multipliers are available for nearly 100 industries.

The Scottish model captures direct, indirect and induced effects, these effects are described in the Scottish Government's model guide ([available online](#)). The direct effects are those associated with the direct conference spending (delegate expenditure and conference organisation expenditure). The indirect and induced effects are described in the Scottish Government's model guide as follows:

- (a) Indirect effects: as producers increase their output, there will also be an increase in use on their suppliers and so on down the supply chain; this is the indirect effect.
- (b) Induced effects: as a result of the direct and indirect effects the level of household income throughout the economy will increase as a result of increased employment. A proportion of this increased income will be re-spent on final goods and services: this is the induced effect.

The categories of expenditure are based on information from the Glasgow Convention Bureau and previous estimates of international delegate expenditure ((Li et al, 2013). Delegate expenditure was apportioned to five categories, just over two thirds (68%) of spending was on accommodation.

All expenditure categories were mapped to industries in the Scottish Government's Input-Output model. Some categories, including accommodation, were relatively straightforward to map. Other categories of delegate expenditure included shopping and gifts (12%), this category was too broad to map directly to Input-Output industries.

Delegate expenditure on shopping and gifts was allocated to the 36 Input-Output manufacturing industries using the expenditure pattern of non-resident households in the Input-Output combined use table. Most of the delegate's shopping and gifts expenditure was allocated to wearing apparel and other textiles⁴ (5.3%) and spirits and other drinks⁵ (1.2%). The two areas of clothing and drinks accounted for most (6.5%) of expenditure on shopping and gifts (12%).

Conference organisation expenditure was apportioned to 25 categories, including venue hire, food and drink, advertising and printing. This allowed a direct mapping to Input-Output industries.

The expenditure associated with supranational conferences in Glasgow (£40.0m) was adjusted to take into account imports from outside of Scotland. The output and supply table, published by the Scottish Government, shows the total supply of products including the domestic output of products, imports of products from the rest of the UK and the rest of the world. This allowed an estimate to be made of conference associated expenditure on goods and services produced in Scotland.

Glasgow's supranational conference associated expenditure on Scottish goods and services was estimated to be £35.4m (89% of direct expenditure). The share of some goods and services produced in Scotland was relatively low including wearing apparel (15%) and advertising (34%). For other products the share produced in Scotland was relatively high including spirits and wines (74%). A small number of services were assumed to be wholly produced in Scotland including accommodation and food and beverage services.

Figures 3 to 5 show the economic impact of Glasgow's supranational conferences on the Scottish economy in terms of output, Gross Value Added (GVA) and employment. Employment was measured in terms of Full-Time-Equivalent (FTE) jobs where two part-time jobs are the equivalent of one full-time job. The economic impact of Glasgow's supranational conferences on Scotland's economy generated £52.5m of output, £31.4m of GVA and 714 FTE jobs.

⁴ Textiles, wearing apparel and leather goods.

⁵ Spirits & wines, beer & malt and soft drinks.

Figure 3: Supranational conferences impact on output (Scotland £m)

Source	Direct	Indirect	Induced	Total
Delegate impact	£18.9	£4.2	£4.9	£27.9
Organisation impact	£16.5	£4.4	£3.7	£24.6
Total impact	£35.4	£8.6	£8.5	£52.5

Source: Based on Scottish Government Input-Output model

Figure 4: Supranational conferences impact on GVA (Scotland £m)

Source	Direct	Indirect	Induced	Total
Delegate impact	£11.7	£2.1	£3.0	£16.8
Organisation impact	£10.1	£2.3	£2.2	£14.6
Total impact	£21.8	£4.4	£5.2	£31.4

Source: Based on Scottish Government Input-Output model

Figure 5: Supranational conferences impact on employment (Scotland FTE)

Source	Direct	Indirect	Induced	Total
Delegate impact	330	38	41	408
Organisation impact	233	42	30	306
Total impact	563	80	71	714

Source: Based on Scottish Government Input-Output model

Figure 6 sets out the ten industries with the largest economic impact from Glasgow's supranational conferences on the Scottish economy in terms of output, Gross Value Added (GVA) and employment. The accommodation and food & beverage industries account for the largest share of the supranational conferences economic impact, 42% of output and 59% of employment.

Figure 6: Glasgow's supranational conferences, economic impact in Scotland by industry

Output (£m)

SIC	Industry	Impact
55	Accommodation	£15.9
56	Food & beverage	£6.2
68.1-2	Real estate (own)	£4.0
82	Business support	£4.0
77	Rental and leasing	£1.6
78	Employment services	£1.5
41-43	Construction	£1.2
47	Retail	£1.1
79	Travel & related services	£1.1
64	Financial services	£1.0

Gross Value Added (£m)

SIC	Industry	Impact
55	Accommodation	£10.4
56	Food & beverage	£3.6
68.1-2	Real estate (own)	£2.9
82	Business support	£2.4
77	Rental and leasing	£1.0
78	Employment services	£0.9
47	Retail	£0.7
41-43	Construction	£0.5
64	Financial services	£0.5
49.3-5	Other land transport	£0.4

Employment (FTE)

SIC	Industry	Impact
55	Accommodation	276
56	Food & beverage	143
68.1-2	Real estate (own)	11
82	Business support	82
77	Rental and leasing	15
78	Employment services	29
47	Retail	19
41-43	Construction	9
64	Financial services	5
49.3-5	Other land transport	9

The output multiplier for supranational conferences (measuring the effects across the Scottish economy) was 1.48. This is marginally higher than the type II output multiplier (including direct, indirect and induced effects) for the spirits & wines industry (including Scotch Whisky) at 1.44 (based on the latest Scottish Government Input-Output model for 2015). The GVA multiplier for supranational conferences was 1.44 which was around the same as the spirits and wines industry at 1.43.

The employment multiplier for supranational conferences (measuring the effects across the Scottish economy) was 1.27. This is marginally higher than the type II output multiplier (including direct, indirect and induced effects) for the accommodation industry at 1.24. It is unsurprising that the employment multipliers are similar as the accommodation industry accounts for a significant share (39%) of the supranational conference employment impact.

Gravity modelling

Further analysis was undertaken to analyse the share and distribution pattern of economic impact within Scotland and Glasgow. In order to undertake this analysis an additional modelling approach was required. This is because in our experience top-down Input-Output modelling, which works well at national and regional level, is not as satisfactory at a more local level as it does not sufficiently reflect more localised characteristics of an economy.

Gravity models are used to estimate economic outcomes based on “the masses of economic activity at origin and destination and inversely with the distance between origin and destination.” (Anderson, 2016). The basic form of the gravity model is where the economic flow X_{ij} from origin i to destination j is set out below, where G is the gravitational constant, Y_i is the relevant economic activity mass at origin i , E_j is the relevant economic activity mass at destination j and D_{ij} is the distance between i and j (Anderson, 2016).

$$X_{ij} = G \frac{Y_i E_j}{D_{ij}^2}$$

Viewforth Consulting have developed a gravity model to reflect more aspects of the local economy and better captures distribution of impact at a local level. The approach involves firstly identifying positive mass or attraction variables reflecting the availability in the locations of interest of consumer and producer goods and services.

The positive variables were combined with negative distance variables reflecting the travel time and convenience cost from the main place of residence and place of work. A modelled combination of these variables was applied to derive estimates of the pattern of impact distribution across local areas.

Gravity models are commonly used to analyse international trade and investment. Gravity modelling has been used extensively to measure the possible outcomes from the UK leaving the EU, and the economic implications of alternative free trade arrangements (Gudgin et al, 2017).

In advance of the 2014 Scottish independence referendum, the Treasury published estimates of the potential impacts of independence on trade and migration between Scotland and the rest of the UK (Treasury, H.M., 2013). The Treasury estimates were based on gravity modelling showing how patterns of trade and migration between countries were influenced by the economic size and distance between countries.

There are limited examples of gravity models used for geographical economic impact distribution. However, the theoretical arguments are essentially the same as for adopting a gravity modelling approach to the estimation of interregional trade flows.

The two gravity models combined mass and distance variables to model the geographic distribution of the economic impact. The first gravity model distributed the Scottish economic impacts across Scotland's 32 local authority areas. The second gravity model distributed the economic impact arising within the Glasgow City Council area across the seven UK parliamentary constituencies (wholly contained within the local authority boundary).

For the first gravity model, the mass variables were based on the latest workplace-based employment estimates from the Business Register and Employment Survey (BRES) for 2017 for each of the 32 local authority areas. The distance variables were based on travel time (by road) from the location of each Glasgow conference to the administrative centre of each local authority.

For the second gravity model two sets of mass variables were used. The first set of mass variables were based on the latest workplace-based employment estimates from BRES for 2017 for each of the seven constituencies. The second set of mass variables were based on the number of residents in employment (residence based) from the Annual Population Survey (APS) for 2018.

For the second gravity model the distance variables were also based on average travel time (by road) from the location of each Glasgow conference to three different locations within each UK parliamentary constituency. The same distance variables were used for both the workplace and residence-based estimates. The modelled results for the top five local authority areas, and the rest of Scotland, are shown in Figure 7.

Figure 7: Economic impact by local authority

Local authority	Output (£m)	GVA (£m)	Employment
Glasgow City	£24.6	£14.7	334
South Lanarkshire	£4.6	£2.7	62
North Lanarkshire	£3.8	£2.3	51
City of Edinburgh	£3.1	£1.9	43
Renfrewshire	£2.3	£1.4	32
Rest of Scotland	£14.1	£8.4	191
Total	£52.5	£31.4	714

Glasgow City captures 47% of the economic impact of Glasgow’s supranational conferences. The neighbouring local authority areas of South Lanarkshire and North Lanarkshire capture a further 16% of the economic impact.

The supranational conferences were grouped into four geographic clusters (shown in Figure 8). Nearly three quarters of Glasgow’s supranational conference activity (73.7%), measured in terms of delegate days, took place in cluster one. Cluster two was based at the University of Strathclyde and the Technology & Innovation Centre (TIC) and accounted for 14.3% of conference activity.

Figure 8: Supranational conference activity by venue cluster

Cluster	Venue	Postcode	Activity Share
Cluster one	Scottish Event Campus	G3 8YW	73.8%
	Crown Plaza	G3 8QT	
Cluster two	TIC & University of Strathclyde	G1 1RD	14.3%
	Trades Hall of Glasgow	G1 1UH	
Cluster three	University of Glasgow	G12 8QQ	8.5%
	Kelvin Hall	G3 8AW	
Cluster four	Glasgow Caledonian University	G4 0BA	3.4%
	DoubleTree by Hilton (Glasgow Central)	G2 3HW	
	Royal Conservatoire of Scotland	G2 3DB	
	Hilton Glasgow	G3 8HT	
Total		-	100%

The gravity modelling was undertaken for each of the four clusters of venues and their distance from each of Glasgow’s UK parliamentary constituencies. There are seven UK parliamentary constituencies within the Glasgow City Council area; Glasgow Central, Glasgow East, Glasgow North, Glasgow North East, Glasgow North West, Glasgow South and Glasgow South West.

As set out above the gravity model used two sets of mass variables drawing on workplace-based employment and residence-based employment. The economic impacts of Glasgow’s supranational conferences by UK parliamentary constituency are shown in Figure 9 (workplace-based) and Figure 10 (residence-based).

The workplace-based model shows 60% of the economic impact of Glasgow’s supranational conferences accrued to Glasgow Central. Glasgow’s city-centre hosts a significant share of the city’s accommodation, food and beverage services and other economic activities, and therefore economic impacts are centred here.

Figure 9: Supranational conference impact (workplace-based)

Area	Output (£m)	GVA (£m)	Employment
Glasgow Central	£14.7	£8.8	200
Glasgow East	£1.5	£0.9	20
Glasgow North	£1.9	£1.1	26
Glasgow North East	£2.2	£1.3	29
Glasgow North West	£1.4	£0.8	18
Glasgow South	£0.6	£0.4	9
Glasgow South West	£2.3	£1.4	32
Total	£24.6	£14.7	334

Figure 10: Supranational conference (residence-based)

Area	Output (£m)	GVA (£m)	Employment
Glasgow Central	£4.9	£3.0	67
Glasgow East	£2.6	£1.5	35
Glasgow North	£3.8	£2.3	52
Glasgow North East	£3.1	£1.8	42
Glasgow North West	£2.9	£1.7	40
Glasgow South	£4.0	£2.4	54
Glasgow South West	£3.3	£2.0	45
Total	£24.6	£14.7	334

When the residence-based model is considered, the economic impacts accruing to Glasgow Central fell by just over two thirds (67%). The economic impacts accruing to all other areas increase significantly. This reflects people commuting to work, i.e. people working in Glasgow Central but living elsewhere in the city.

Residence-based impacts for output, GVA and employment are shown in Figure 10 to allow comparisons with the workplace-based impacts (Figure 9). However, only part of the output and GVA impacts (income from employment) could be reasonably interpreted as a flow of income from the workplace to the place of residence. It is therefore more appropriate to consider employment for the residence-based impacts.

Inclusive growth in Scotland

Scotland's Economic Strategy sets out the Scottish Government's vision for Scotland's economy and society (Scottish Government, 2015). Promoting economic growth and reducing inequalities is the strategy's central theme.

The National Performance Framework (NPF) originally set out 'a purpose target' to reduce the gap between the employment rate for the top three and bottom three performing local authorities (Scottish Government, 2016). The Scottish Government's Council of Economic Advisors (Scottish Government, 2018) set out how to define and monitor inclusive growth for Scotland. The council's review listed a set of components (to be taken together) including productivity, population, participation, people and place.

A Scottish Parliament inquiry into City Region Deals found that "the partners behind the Edinburgh and South-East Scotland City Region (ESESCR) Deal said that clarity was lacking from either government on the exact definition of economic growth to be used to model and assess projects" (Scottish Parliament, 2018).

In terms of 'place' the definition and monitoring of inclusive growth points to "More equal economic opportunities across Scotland's cities, towns and regions and rural areas, ensuring sustainable communities." (Scottish Government, 2018).

The economic impact of Glasgow's supranational conferences demonstrates how impacts could be described in terms of 'place'. This also offers the opportunity to describe economic impacts in terms of inclusive growth. Significant differences in inequality, deprivation and poverty are at least as likely to lie within as well as across local authority boundaries.

For example, in Glasgow North more than one in five workers are employed as managers, directors and senior officials compared to fewer than one in thirty workers in Glasgow North West (Table A.2 appended). Nearly 28.6% of the working age population of Glasgow North East have no qualifications compared to 5.5% among the population of Glasgow North.

The working age unemployment rate of Glasgow South West (12.7%) is nearly four times that of Glasgow Central. The relative difference in outcomes between Glasgow's communities is significantly higher than the difference in outcomes between Glasgow and the rest of Scotland.

The differences are more marked in terms of gross hourly pay (Table A.3 appended). Glasgow North has the third highest median gross hourly pay of the 59 UK parliamentary constituencies and 19% higher than the equivalent figure for Scotland. Glasgow North and borders with the second highest East Dunbartonshire.

Glasgow North East has the second lowest gross hourly pay of any constituency in Scotland, only ahead of Dumfries and Galloway, and 15% lower than the equivalent figure for Scotland. Glasgow East and Glasgow South West are also significantly below the median Scottish gross hourly pay.

The economic impact of Glasgow's supranational conferences is more diffuse when a residence-based rather than workplace-based modelling approach is used. The approach adopted in this paper could be further developed, the gravity modelling approach offers the opportunity to tailor analysis of policies more specifically to the characteristics of each local area.

Conclusions

The impact of supranational conferences is significant. The additionality of supranational conferences is also significant, a relatively high proportion of economic impacts would not have occurred in the absence of the supranational conferences. Although the additionality of international conferences is usually high, those that are not regularly rotated or do not attract a specific delegate cohort are also likely to be associated with lower additionality.

Other large-scale national and international conferences are more likely to attract delegates that might otherwise have spent their money elsewhere within the city, or elsewhere in Scotland. This is illustrated by other major conferences that took place in Glasgow in 2018 that did not meet the supranational conference criteria.

Conferences excluded from the supranational conference impact included a 1,600 delegate conference of the Royal College of Paediatrics & Child Health (4,800 delegate days); a conference of the Society for Cardiothoracic Surgery in Great Britain and Ireland (1,150 delegates spending 3,450 delegate days) and the conference of the National Union of Students (1,240 delegates spending 3,720 delegate days).

A significant link to universities exists but has only been briefly explored in this paper. The role of universities in attracting and supporting conferences could be paid greater attention, in particular the capacity of universities to influence the choice of conference locations. There are likely to be further spillover effects in terms of research collaborations and commercial agreements.

Outside of the Glasgow City Council area three of the other seven Glasgow City Region City Deal partners had an impact of over one million pounds. Three of the six ESESCR Deal partners also have an impact of over one million pounds (Edinburgh, West Lothian and Fife). This highlights the wider economic region across the central belt of Scotland. Activities within the city of Glasgow also drive economic growth well beyond the boundaries of the Glasgow City Region City Deal area.

This paper has illustrated how gravity modelling may offer an approach to better measure the likely impact of economic activity in terms of contributions towards tackling inequality, poverty and deprivation. In particular where impacts that could be described, or that are required to be described in terms of 'place' and in terms of inclusive growth.

Appendix

Figure A.1: Supranational conferences 2018

Speech in Noise Workshop
The Consortium of European Research and Emotion
Association of Catholic Institutes of Education Conference
Annual General Assembly of the Federation of International Music Competitions
European Congress of Sports Traumatology, Knee Surgery and Arthroscopy
International Congress of the World Federation of Haemophilia
Ecology and Evolution of Infectious Diseases Conference
Annual Conference of the European Marketing Academy
International Conference on Stillbirth, SIDS and Infant Survival
Spectroscopy Network
Joint European Conference on Computational Mechanics & Fluid Dynamics
MIPI Alliance 2018 Meeting
European Academic Heritage Network conference 2018
International Conference in Boundary and Interior Layers
Complex Trait Community in collaboration with the Rat Genomics Community
Chromosome 18
Young Atom Opticians
Undersea Defence Technology Conference and Exhibition -UDT Europe
Fluorescent Biomolecules and their Building Blocks
Colloquium of the IUCN Academy of Environmental Law
International Conference on China Urban Development
18th Century Scottish Studies Society Conference
Europhysics Conference on the Atomic and Molecular Physics of Ionized Gases
International Symposium on Rarefied Gas Dynamics
World Down Syndrome Congress
Conference of the European Society for Comparative Endocrinology
Europe-Korea Conference on Science and Technology (EKC)
Global Street Paper Summit
Annual International Conference on Magnetic Resonance Angiography
International Conference on Offshore Renewable Energy
European Association for Chinese Studies Conference
World Congress of Pharmacy and Pharmaceutical Sciences
International UPEC, Universities Power Engineering Conference
8th European Aeronautics Science Network International Conference
European Congress on Emergency Medicine
Social Enterprise World Academic Symposium
28th International Workshop on Computational Mechanics of Materials
Conference of Rectors and Presidents of European Universities of Technology
International Conference on Mechatronics
8th International Systems & Concurrent Engineering for Space Applications Conference
SIG Mobility In-Between Meeting 2018
International Naval Engineering Conference and Exhibition
World Congress on Psychiatric Genetics
International Symposium on ALS/MND

Table A.2: Characteristics of Glasgow's UK parliamentary constituencies 2018

Constituency	Workers in senior positions	People with no qualifications	Unemployment rate
Glasgow North	20.5% (best)	5.5% (best)	4.4%
Glasgow South	8.9%	8.3%	4.7%
Glasgow South West	7.0%	14.8%	12.7% (worst)
Glasgow North East	5.9%	28.6% (worst)	9.7%
Glasgow Central	4.3%	15.7%	3.2% (best)
Glasgow East	4.3%	12.4%	5.3%
Glasgow North West	3.0% (worst)	13.9%	4.8%
Scotland	8.7%	9.7%	4.3%
Glasgow City	7.5%	14.4%	6.3%

Source: Annual Population Survey (APS) 2018

Notes: The share of workers in senior positions show the percentage of all in employment who are managers, directors and senior officials (SOC2010), people with no qualifications shows the percentage of those aged 16-64 with no qualifications and the unemployment rate shows the unemployment rate of those aged 16-64.

Table A.3: Gross hourly pay by constituency

Rank	Constituency	Median
1	East Renfrewshire	£18.58
2	East Dunbartonshire	£17.39
3	Glasgow North	£15.29
4	West Aberdeenshire and Kincardine	£14.85
5	Edinburgh South	£14.84
7	Glasgow North West	£14.66
16	Glasgow South	£13.68
29	Glasgow Central	£12.77
52	Glasgow East	£11.54
56	Glasgow South West	£11.10
57	Moray	£11.02
58	Glasgow North East	£10.98
59	Dumfries and Galloway	£10.92
-	Scotland	£12.89

Source: Annual Survey of Hours and Earnings (ASHE) 2018

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