

DREAM®trip

Making data **bigger**

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Scotland

is one of **four** countries that make up the **United Kingdom (UK)** – England, Scotland, Wales and Northern Ireland

5.1 million inhabitants
77 000 square kilometres

Many tourists – about \$15 bn per year in tourism revenues

- Birthplace of
 - Whisky
 - Golf
 - Television
 - Steam engines
 - Braveheart, Harry Potter, the Loch Ness Monster (?) and many many more
- Modern, historical, beautiful hospitable and **fun**



PURPOSE AND SCOPE

- There is very little regulation of tourism in the UK, so very little data is available from official records –there is no official record of hotel guests, for example
- So most UK tourism data comes from **two big continuous surveys** – the International Passenger Survey (250 000 interviews of travellers) and the Great Britain Tourism Survey (120 000 interviews of citizens)
- These surveys have been running for 50 and 30 years. They are excellent for **annual data** at **country level**, but sample sizes become small for smaller areas, or for monitoring at more frequent intervals

Organisation of **DREAM®**trip

- The Scottish tourist board (**Visit Scotland**) in conjunction with local governments (**Scottish Local Authorities Economic Development Group**) asked for tenders to replace an existing modelling system
 - Did not add up
 - Did not match national economic statistics or industrial reality
 - Out of date economic data and classifications : 1979 multipliers(!) and SIC92 = NACE Rev2 (1980s)
 - Methodology kept secret 'for commercial reasons'
 - Published **eighteen months** after the event
- The **Moffat Centre** (tourism institute at Glasgow Caledonian University, Scotland's largest and most international university) and **cogentsi** (Cogent Strategies International Ltd, small consultancy in economic measurement and national accounting) offered a three year project to develop a model
 - Consistent across the global tourism industry
 - Consistent with the national accounts for Scotland, UK and EU
 - Latest data and classifications – last year Input Output, ESA10 (=SNA07) and SIC2007 = NACE3 = ISIC 3.2
 - Open methodology and active publication programme – **for example this presentation**
 - Published **one/two months** after the event

Expected **six** users, currently **23**

DREAM® = **D**etailed **R**egional **E**conomic **A**ccounting **M**odel

So what do we do?

Where am I? understanding geography

- Conceptual core is an 85*85 origin-destination matrix covering **all world tourism** (but of course we work hardest on the Scottish parts)
- 85 = 32 Scottish local government areas plus
 - 12 other regions of the UK (for example London, Wales, South West...)
 - 19 other parts of the European Union
 - 6 other parts of Europe and the former Soviet Union
 - 4 parts of the Americas and Caribbean
 - 3 parts of Africa
 - 6 parts of Asia and Oceania
 - Rest of world
- **85*85 = 7225**
 - EVERY MONTH
 - TRIPS – NIGHTS – SPEND
 - BY PURPOSE – Holiday – VFR – Business – Study - Other

Origin-destination matrix	Scotland (32)	Rest of UK (12)	Rest of Europe (25)	Rest of World (16)	Total
Scotland (32)					
Rest of UK (12)					
Rest of Europe (25)					
Rest of World (16)					
Total					

= 1.3 million data points per year

= 'quite big data' - *obviously beyond what is actually measured*

Why so ambitious?

- **Huge** advantage of adding up to the whole world
 - Compatibility with UNWTO
 - For example can easily include United States 2-way tourism figures, or monitor the \$, and the USA send 12 per cent of our international visitors
 - Can make full use of Eurostat outputs , or monitor the €, and the EU sends 51 per cent of our visitors
 - Can track the Commonwealth, which dominates our international 'visiting friends and relations' market
 - Follow emerging markets, where probably the growth for all of us lies
- Maps to airport statistics, and suggests intelligence about which air-routes to recruit

How do we do it internationally?

Measure what you easily can

- Most effort on the
 - Row totals – how many tourists based in the territory?
 - Column totals – how many visitors to destinations in the territory?
 - Diagonals – how much domestic tourism? (split day/overnight if possible)

- Most destinations publish an annual ‘top ten origins’
- Some origins publish a ‘top five destinations’
- TSAs useful

... .. and estimate the rest

- Cells depend on
 - Distance from origin to destination, compounded with oil price
 - Real income at the origin
 - Price competitiveness (inflation and exchange rates) at destination
- Estimation method borrows from
 - Gravity models
 - Almost Ideal Demand System (Deaton and Muellbauer)

... .. and make sure the totals add up!

How do we do it internally in Scotland?

Combine modelling and survey data – minimum variance

survey data – most accurate for large destinations

X-section model data – most accurate for ‘typical’ destinations

time series data – better for larger, but quite uniform

Modelling row totals – ie origins or outgoing tourists

Totals based on income at origin and consumption functions

Modelling columns – quantifiable destination characteristics

Mountains, lochs (lakes), trees, coast, weather, monuments, buildings, entertainments, attractions, accommodation, distances, economic activity, prices

Cells – based on distance

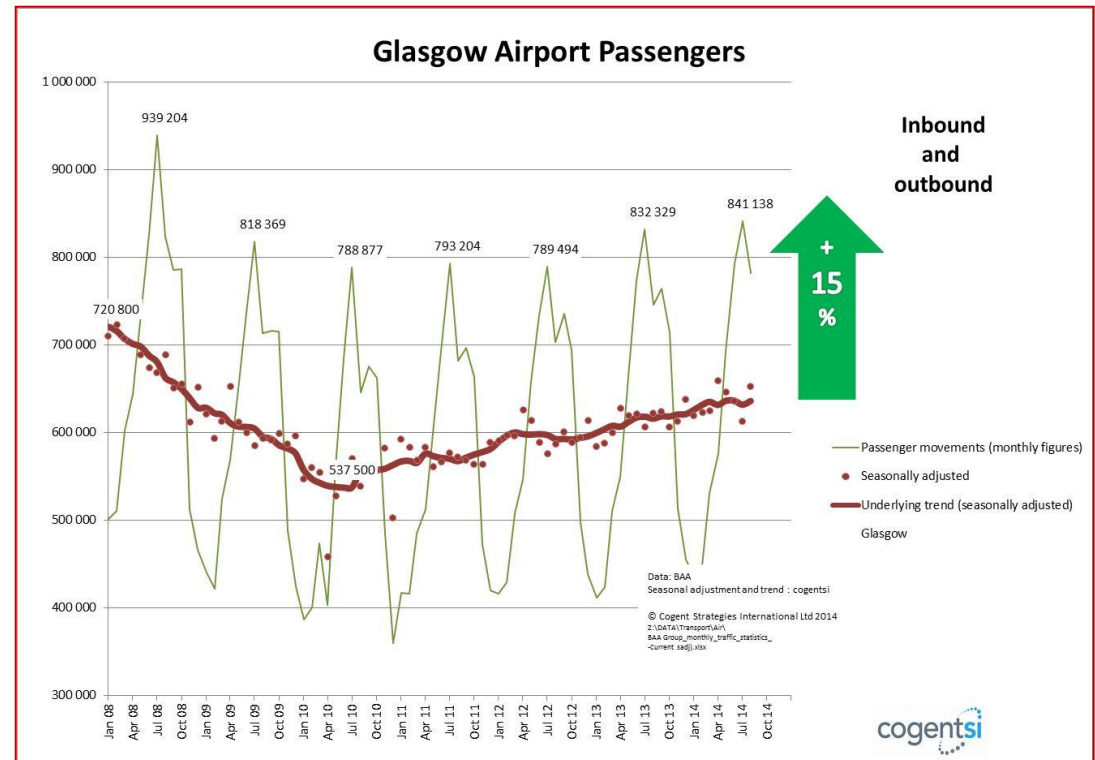
National/international split based on relative prices and incomes

MAKE SURE IT ALL ADDS UP

Bang up-to-date (1)

First of all, get the seasonal pattern and trend right!

- We use a primitive version of X-12
- Separates a series into
 - Underlying trend-cycle
 - Regular seasonal pattern
 - Day-of-the-week factors
 - Easter/ public holiday
 - Monthly repetitive cycle
 - Weather variables
 - Irregular factors
- We don't (normally) use pre-adjusted series from the Office for National Statistics



Bang up-to-date! (2)

- We do NOWcasting up to the present
- We DO NOT forecast the future
- We do some BACKcasting of the past

- Econometric models are based on some kind of economic theory and follow the direction of causality
- Nowcasting models don't need to be
 - for example it is obvious that tourism causes airport passenger flow, not the other way round
 - But we can use airport passenger flow (available very quickly) to guess what tourism probably is
- Key nowcasting variables
 - Weather
 - Traffic flow (cars and air passengers)
 - Accommodation occupancy
 - National totals published sooner than regional detail
 - Economic drivers or surrogates – for example unemployment.

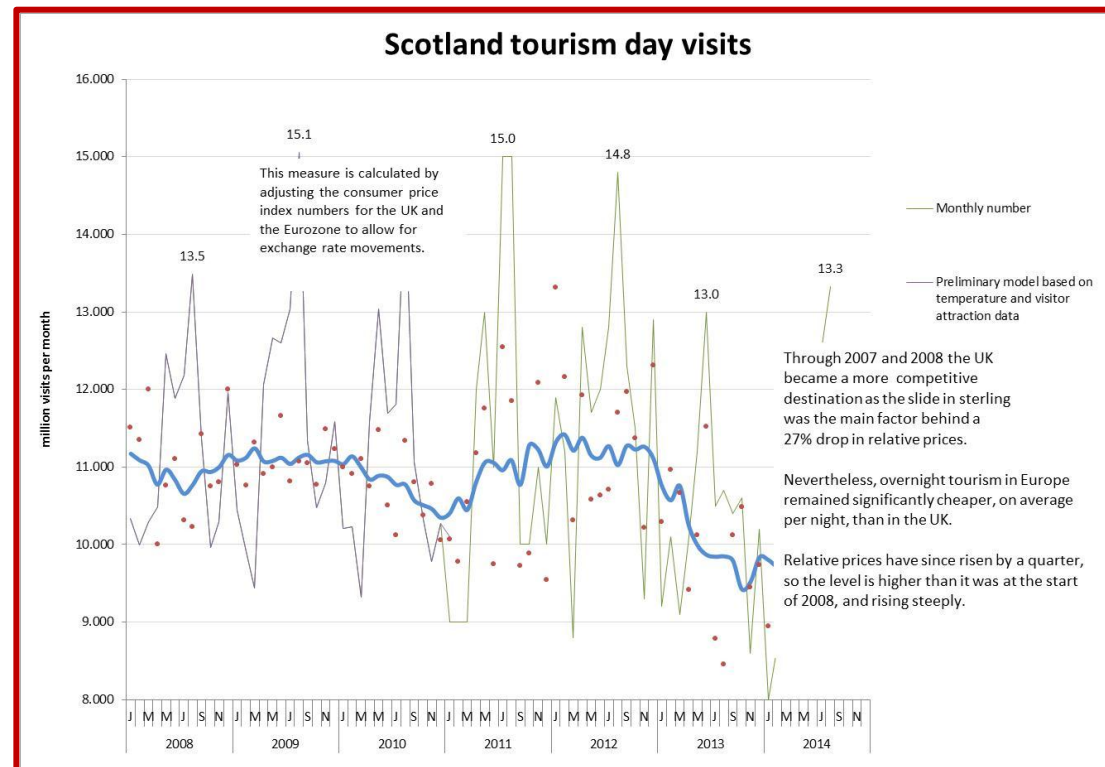
Backcasting ('forecasting' backwards in time)

1) New data series – day excursionists

- New survey, based on internet panels – only running for three years
- Simple back-cast model based on
 - weather
 - visits to tourist attractions
 - retail purchases

2) Main survey, UKTS

- Past changes in methodology
- Backcasting provides continuous series



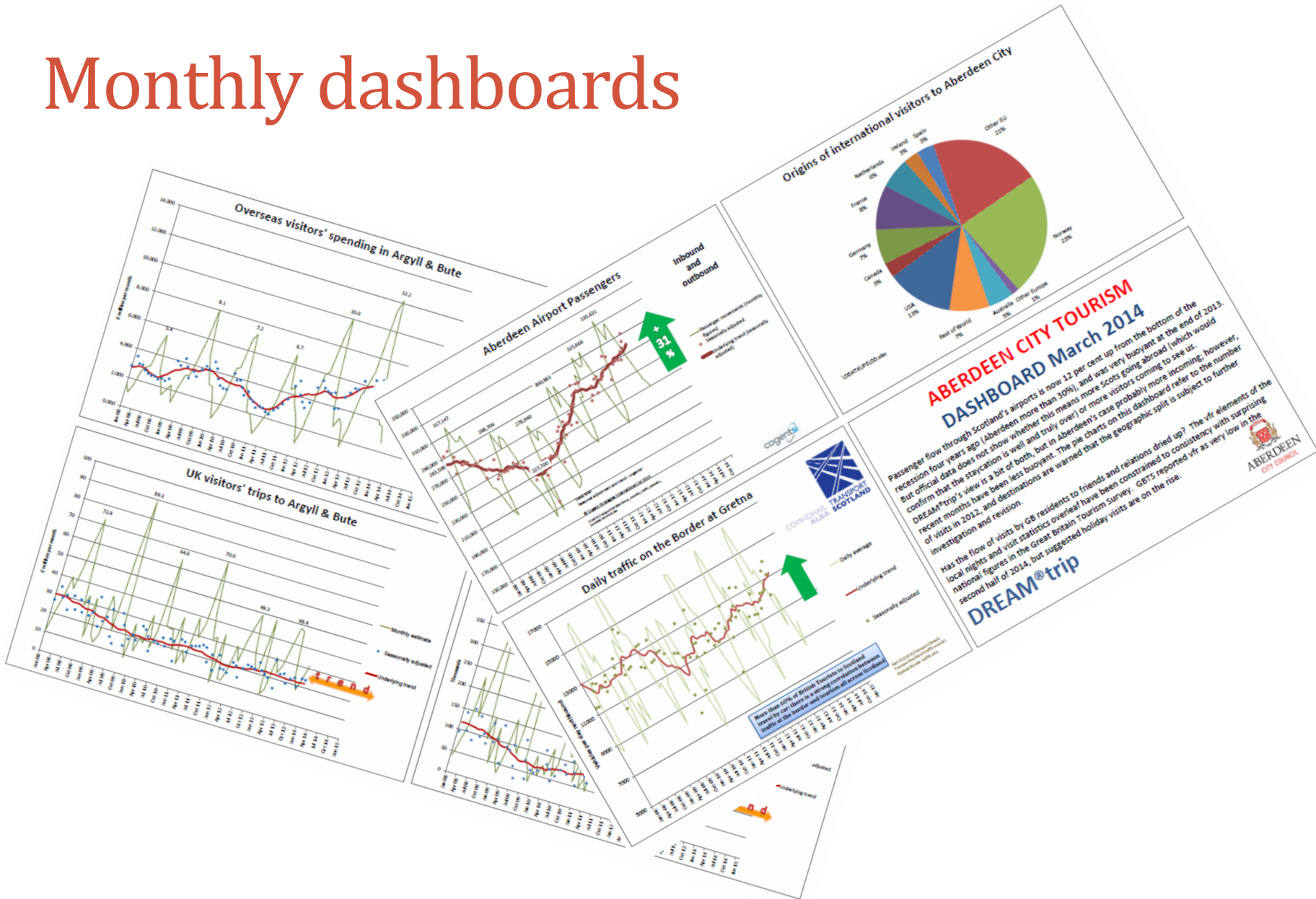
A three year project ...

1. Collect and check the data, build first models
2. Refine and link the models
3. Automate the production process and the outputs

... but for the good of the product and to motivate funding

issue outputs from (very near) the start

Monthly dashboards



Four reports a year

- Pre season set up
- Detailed numerical update and market shares
- Annual heavyweight :
 - Tourism Satellite Accounts, industry %ges etc
 - Tourism multipliers based on regional input – output
- ‘Flash estimate of latest season

plus working paper series and conferences

- Serious need for user training

DREAM®trip

- Consistent across the global tourism industry
 - Consistent with the economy
 - Uses and checks the data that we do have, and
 - tries intelligently to fill in the data that we do not
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- Enough authority to be used by Government
 - Enough immediacy to add value for tourism operators

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- Surprised to be here!
 - Thank you to the organisers
 - Thank you for listening!