

The Resilience Scorecard: assessing regional economic resilience for the implementation of LIS

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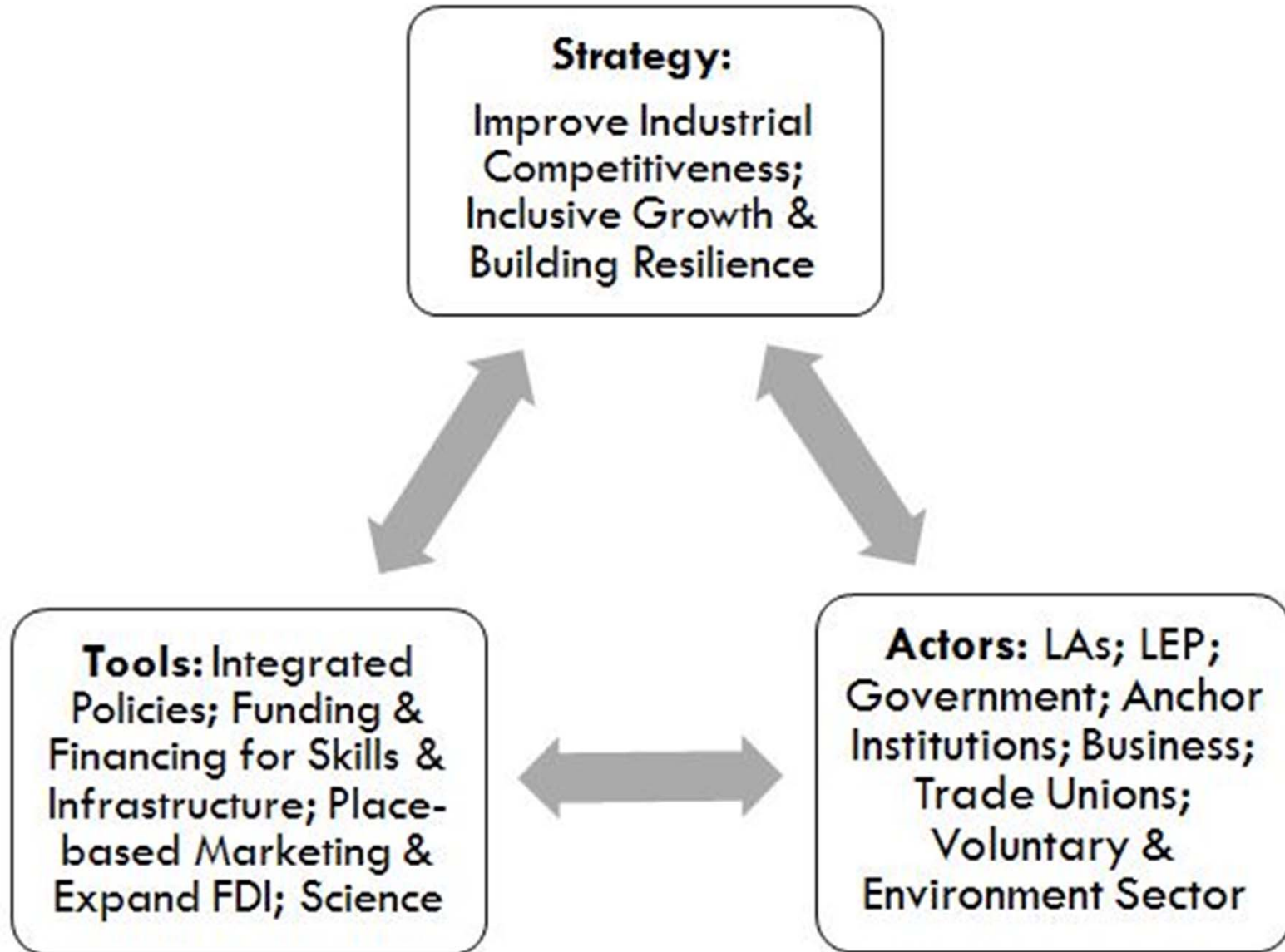
Outline of talk

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- Elements of a Local Industrial Strategy (LIS)
- Regional Economic Resilience
- Regional Real GVA, Jobs & Productivity data
- Dating Business Cycle Turning Points
- Metrics for Measuring Resilience
- Summarising Resilience: Scorecard
- NUTS 2 resilience cross-sections
- Conclusions

Elements of a Local Industrial Strategy

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Source: O'Brien, et al, (2017) CURDS TUC report for Tees Valley Industrial Strategy

Designing a Resilient Local IS

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- In the monitoring of key metrics for a LIS we need to understand how a place has evolved over time and its economic resilience to shocks.
- Economic resilience is the ability of an economy to withstand or recover from an economic shock which could be a global event (the financial crisis), national event (UK house price crash of the early 1990s) or a local event (the closing of a factory).
- This paper investigates the economic resilience of UK regions in the run up to the financial crisis, during and afterwards. We analyse the resistance, recovery and renewal of output, employment and productivity data over 1998-2017.

Martin (2012, JEG) defines four dimensions of economic resilience to describe how a regional economy responds to a recessionary shock:

- 1. Resistance** is the sensitivity of a region compared to the nation during the recession.
- 2.** Speed and extent of **recovery** from the recession.
- 3.** Has the region gone through structural **re-orientation** and what implications this has for the region's jobs, output and income.
- 4.** The degree of **renewal** a region will undergo following the shock and the extent to which it renews its growth path.

Data: Experimental Real GVA

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- The ONS released a new measure of balanced GVA in 2017 for regions, a chained volume measure in real terms (in 2016 pounds).
- We use real GVA and the ONS productivity jobs estimate to date turning points in the business cycle and to quantify regional resilience.
- $\text{Real Productivity} = \text{real GVA} / \text{productivity jobs}$

UK Regional Shares of Real GVA

Region	1998	2007	2017
North East	3.23	3.23	2.95
North West	9.89	10.01	9.62
Yorkshire & The Humber	7.18	7.24	6.46
East Midlands	6.17	5.89	5.76
West Midlands	8.02	7.3	7.36
East of England	8.74	8.59	8.48
London	19.86	21.9	24.01
South East	15.24	14.7	14.81
South West	7.7	7.41	7.25
Wales	3.72	3.59	3.44
Scotland	7.91	7.79	7.67
Northern Ireland	2.33	2.34	2.19

Source: ONS GVA(B), balanced measure of GVA, chained volume measure in real terms.

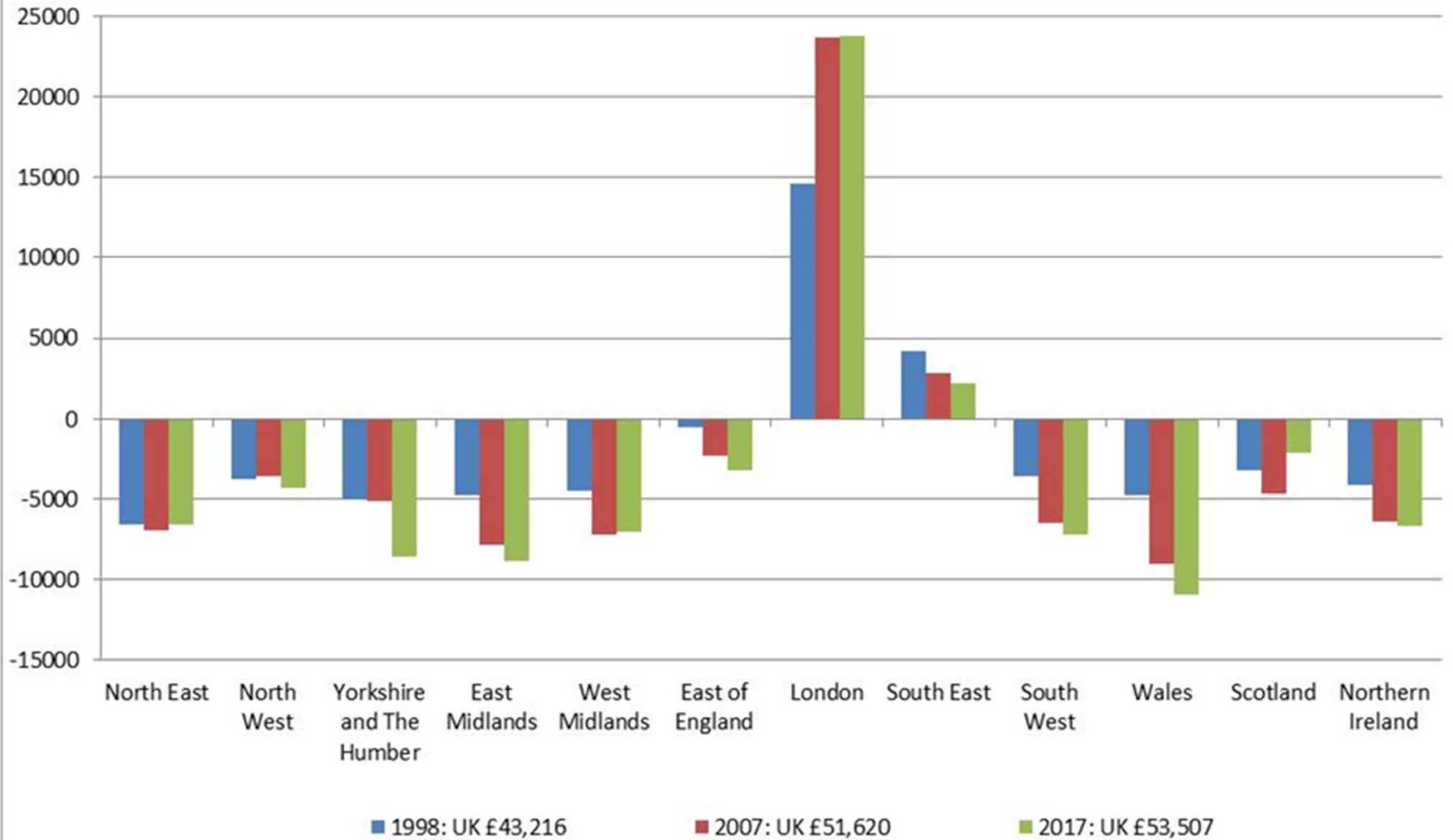
Regional Shares of Productivity Jobs

Region	1998	2007	2017
North East	3.82	3.72	3.37
North West	10.85	10.72	10.47
Yorkshire & The Humber	8.13	7.97	7.69
East Midlands	6.94	6.84	6.9
West Midlands	8.96	8.45	8.48
East of England	8.84	8.96	9.02
London	14.84	15.35	16.63
South East	13.89	13.92	14.23
South West	8.4	8.47	8.38
Wales	4.19	4.33	4.33
Scotland	8.56	8.59	7.99
Northern Ireland	2.58	2.68	2.5

Source: ONS, Regional and sub-regional productivity in the UK: February 2019.

UK Productivity Regional Differences

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Sensier, Bristow & Healy (2016, SEA) classify the economic resilience of regions across Europe following the global financial crisis.

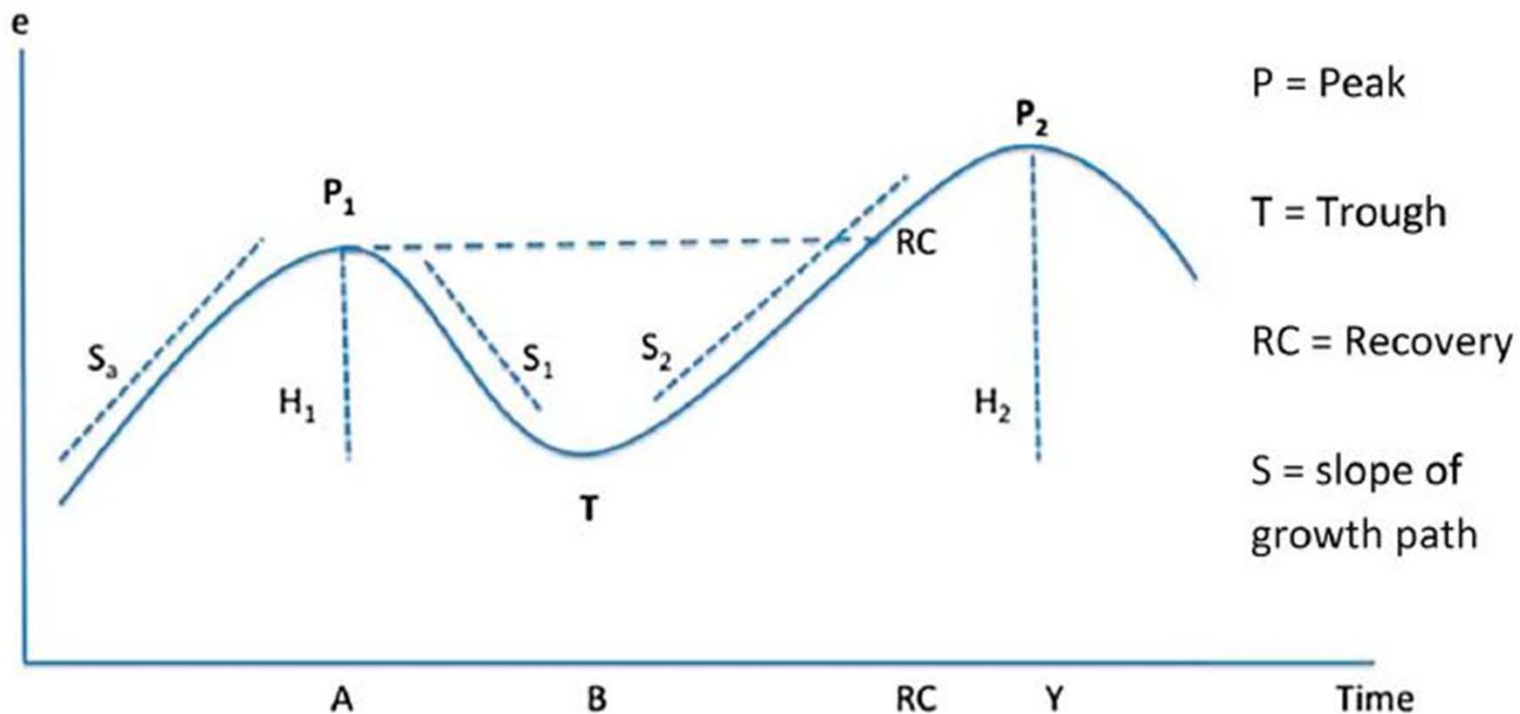


Figure 1. Stylised employment cycle.

Dating Business Cycle Turning Points

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- Calculation of turning points, our analysis differs to Martin (2012) in that we allow regions to have individually dated peak and troughs for local maximum and minimum points, respectively.
- Harding and Pagan (2002) dating algorithm applied in Stata. Two phases expansion (peak ends this phase) and recession (trough ends this).
- Allow a window of 3 years around the national recession dates.
- Possible to have a “double dip” slight increase followed by lower trough minimum point.

- Pre-recession we measure the expansion average growth rate (EAGR) by calculating the average over 5 years (first difference of ln) including the peak year. This is to measure the rate of growth before the recession.
- LOSS: we calculate the loss over the recession by taking the percentage loss between peak and trough, for example with employment (E):
$$\text{Employment}_{\text{Lost}} = 100x(E_P - E_T) / (E_P)$$
- E2AGR is the average rate of growth for 5 years following the trough recession date.

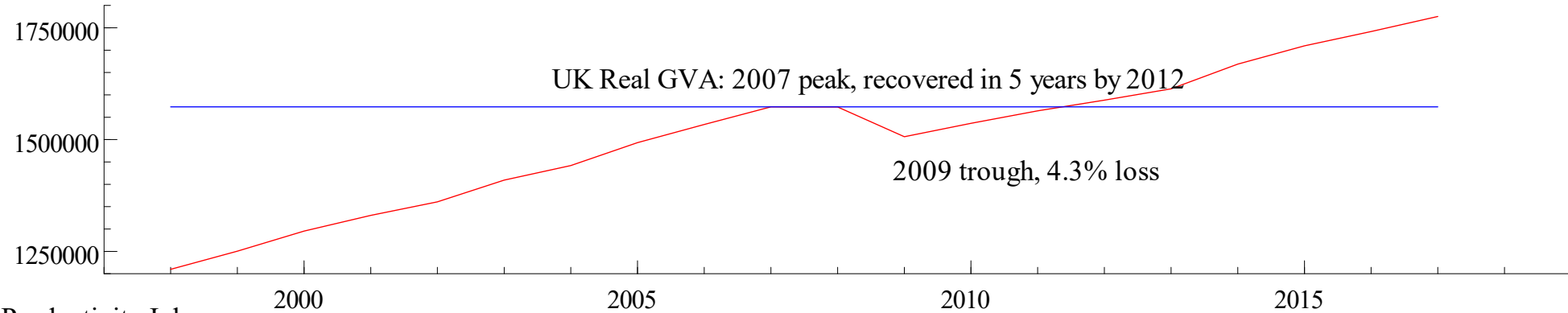
- We compare the 12 NUTS 1 level areas to the loss at the national level to gauge if the region has been more resistant to the recession than the nation.
- We compare the region/country to the national percentage loss by calculating (Martin, 2012):
$$\text{Beta} = \text{Region Loss} / \text{Nation Loss}$$
- Value of $\text{Beta} > 1$, region loss more than nation, region is less resistant.
- Value of $\text{Beta} < 1$, region loss less than nation, region is more resistant.

To calculate a regional ranking of resilience from the statistics, we ask the questions (Yes=1, No=0):

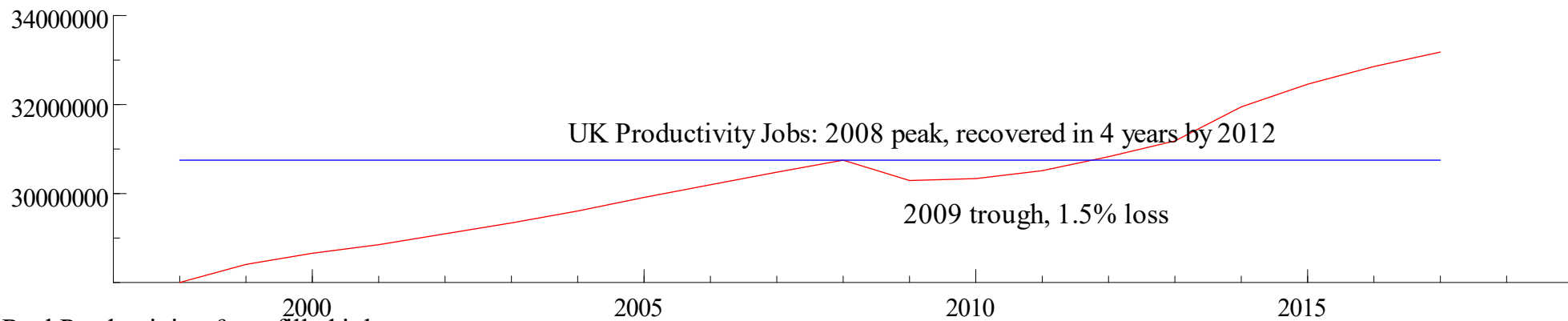
1. Has the fall in GVA/jobs/productivity been less than the national decrease? $\text{Beta} < 1$
2. Has the duration of the recession been shorter or the same as than the national recession?
3. Has the region recovered faster or at the same time as the nation?
4. Was the rate of growth after the recession greater than before ($\text{E2AGR} > \text{EAGR}$)? A greater rate of increase means the region is accelerating to a higher growth path.

UK Real GVA, Jobs & Productivity

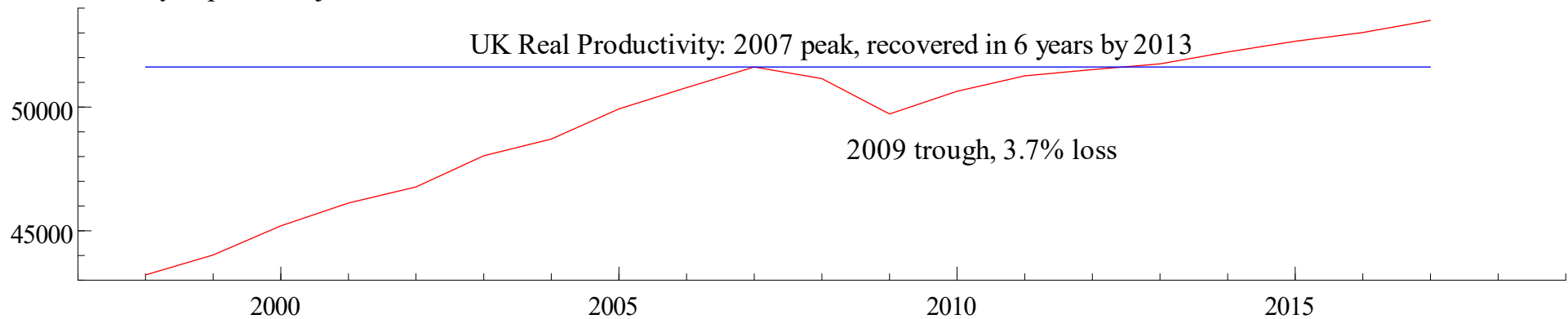
Real GVA: £ millions



Productivity Jobs



Real Productivity: £ per filled job

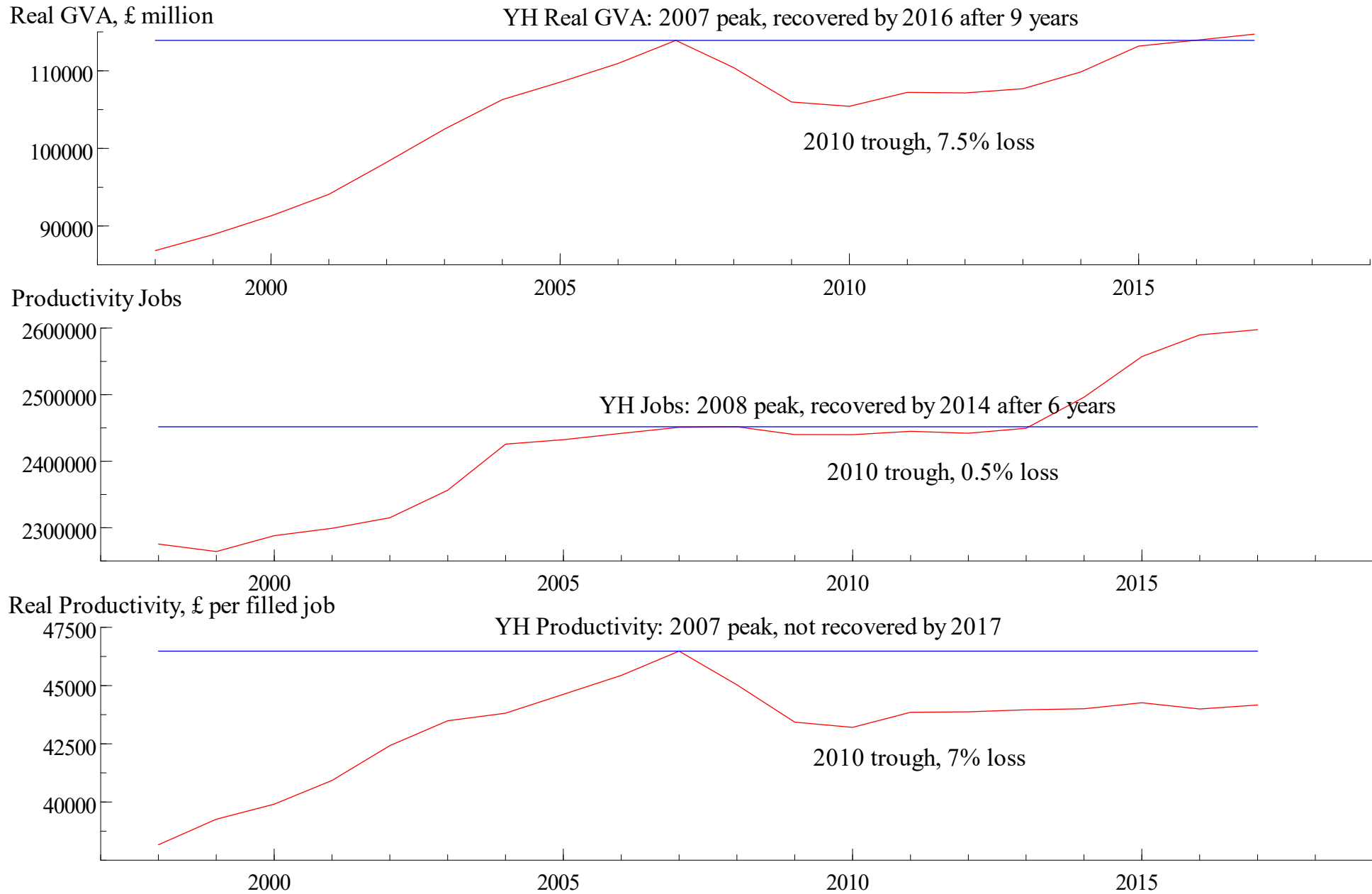


Regional Resilience of Real GVA

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Rgn	Peak	Trough	LOSS	Beta	RC	EAGR	E2AGR
UK	2007	2009	-4.3%	1	2012	2.9	2.05
NE	2006	2009	-4.2%	0.99	2015	3.79	0.79
NW	2007	2009	-3.6%	0.85	2014	2.98	1.07
YH	2007	2010	-7.5%	1.75	2016	2.97	1.42
EM	2007	2009	-5.6%	1.31	2012	2.88	2.29
WM	2007	2009	-6.4%	1.5	2012	1.76	2.47
ET	2008	2009	-4.5%	1.05	2014	1.64	1.67
LN	2008	2009	-5.7%	1.33	2011	3.73	3.33
SE	2008	2009	-3.8%	0.89	2011	1.86	1.94
SW	2008	2009	-3.3%	0.79	2012	1.66	1.83
WL	2007	2009	-5.7%	1.34	2012	2.56	1.65
SC	2008	2009	-3.1%	0.72	2011	2.6	1.93
NI	2007	2010	-6.5%	1.51	2015	3	1.69

Yorkshire and The Humber

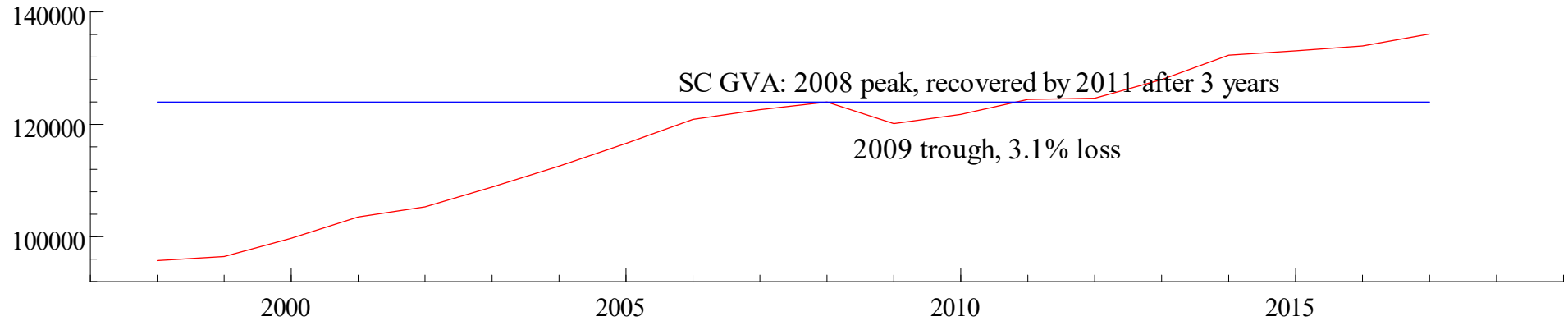


Resilience of Productivity Jobs

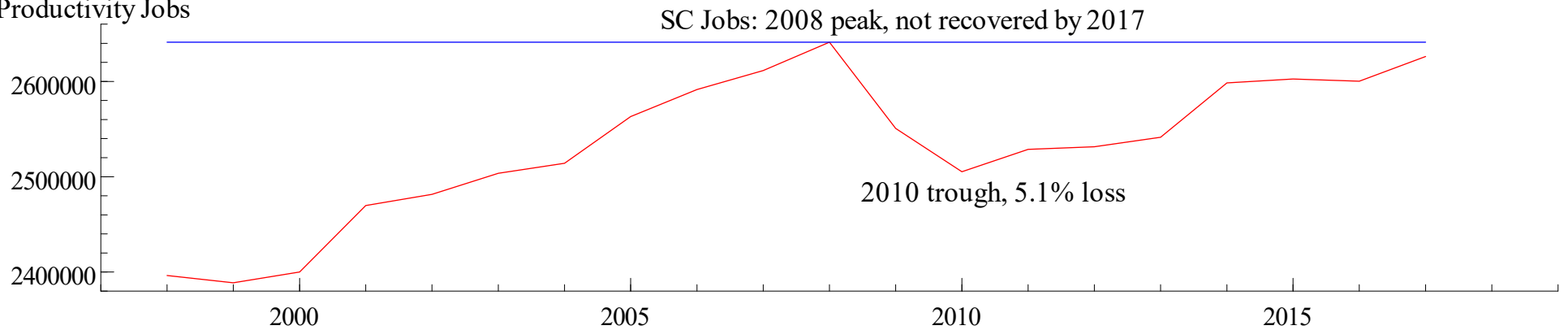
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Rgn	Peak	Trough	LOSS	Beta	RC	EAGR	E2AGR
UK	2008	2009	-1.49	1	2012	0.94	1.06
NE	2008	2012	-3.52	2.37	NR	1.06	0.48
NW	2008	2011	-0.76	0.51	2013	0.63	1.12
YH	2008	2010	-0.48	0.32	2014	0.79	0.94
EM	2007	2009	-2.9	1.95	2011	1.71	0.92
WM	2008	2010	-3.24	2.18	2013	0.54	1.42
ET	2008	2010	-1.61	1.08	2012	0.98	1.63
LN	2008	2010	-1.62	1.09	2011	1.27	2.85
SE	2008	2009	-1.67	1.12	2011	0.65	1.29
SW	2008	2009	-0.13	0.09	2010	1.09	1.03
WL	2008	2011	-1.24	0.84	2014	0.99	1.19
SC	2008	2010	-5.14	3.46	NR	1.07	0.76
NI	2008	2012	-5.94	4	2017	1.32	1.45

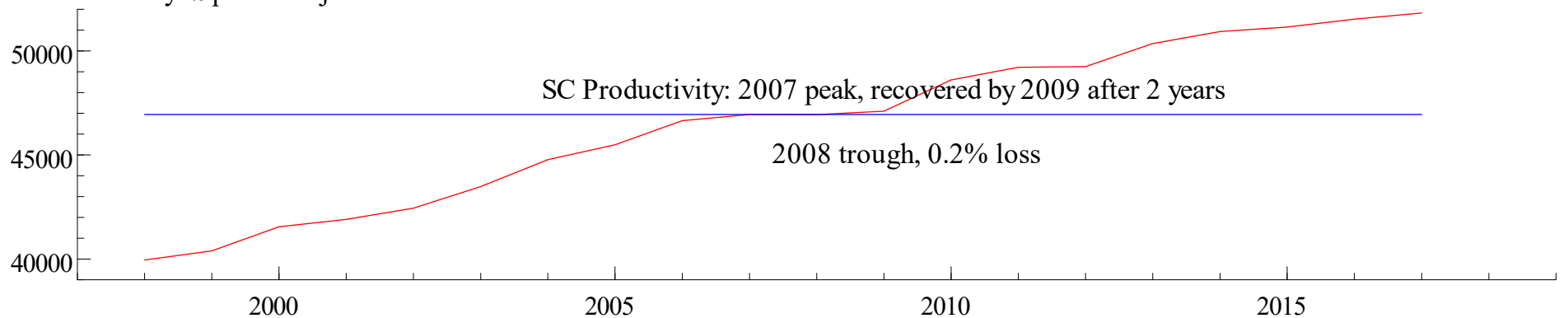
Real GVA: £ million



Productivity Jobs



Real Productivity: £ per filled job

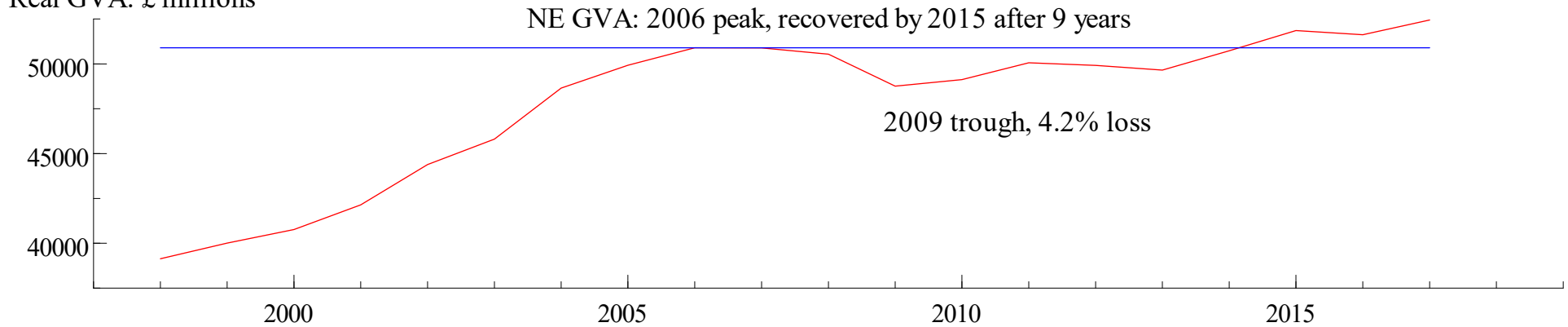


Resilience of Real Productivity

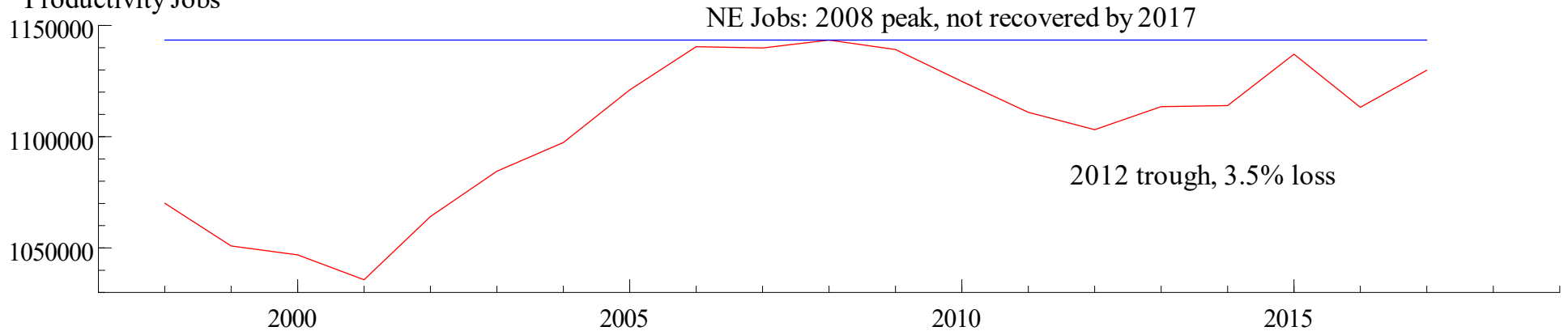
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Rgn	Peak	Trough	LOSS	Beta	RC	EAGR	E2AGR
UK	2007	2009	-3.67	1	2013	1.97	0.98
NE	2007	2009	-4.13	1.13	2011	1.36	1.24
NW	2007	2009	-3.33	0.91	2015	2.23	0.3
YH	2007	2010	-7.04	1.92	NR	1.83	0.48
EM	2008	2009	-3.06	0.83	2012	0.87	1.37
WM	2007	2009	-4.06	1.10	2011	1.12	1.59
ET	2007	2009	-3.39	0.92	2016	1.39	0.44
LN	2007	2009	-6.19	1.68	2016	3.64	0.91
SE	2008	2009	-2.13	0.58	2013	1.21	0.65
SW	2006	2009	-3.66	1	2014	1.02	0.79
WL	2007	2009	-5.55	1.51	2011	1.27	0.91
SC	2007	2008	-0.02	0.01	2009	2.02	1.4
NI	2007	2010	-6.24	1.7	2012	1.7	1.74

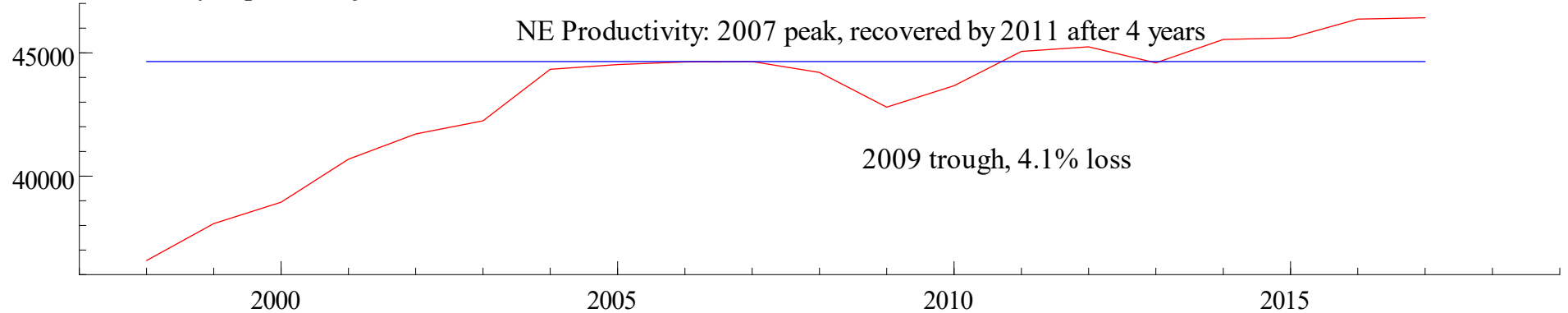
Real GVA: £ millions



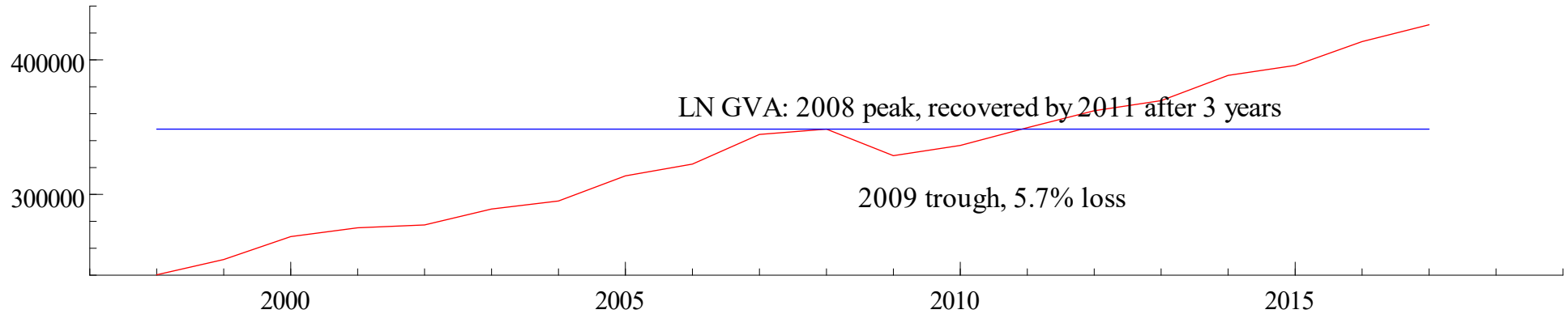
Productivity Jobs



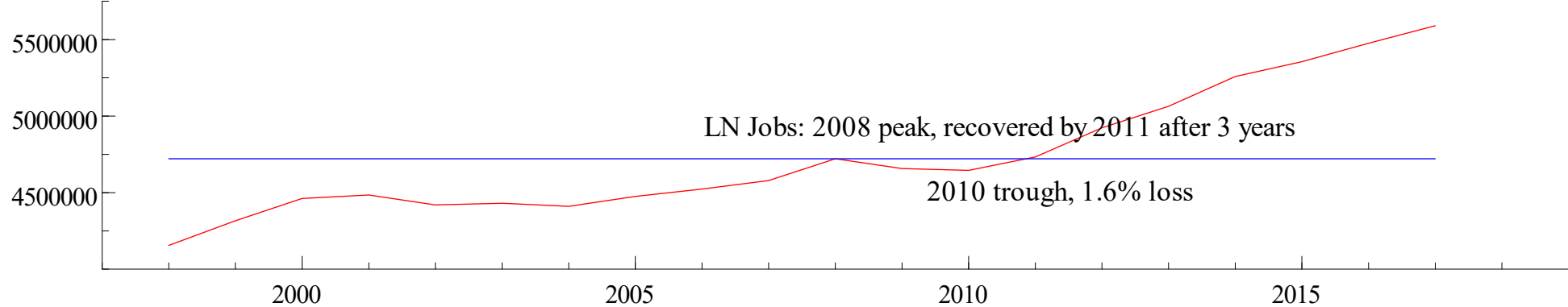
Real Productivity: £ per filled job



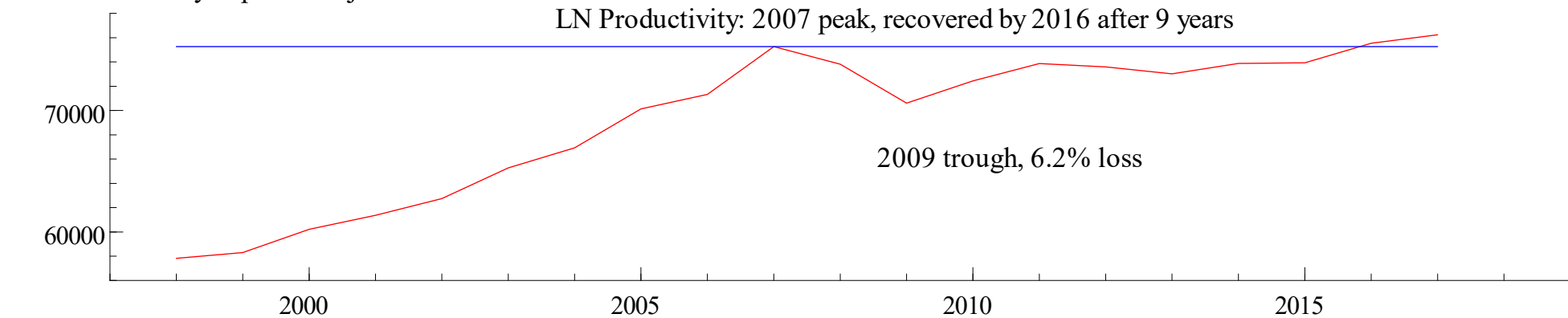
Real GVA: £ millions



Productivity Jobs



Real Productivity: £ per filled job

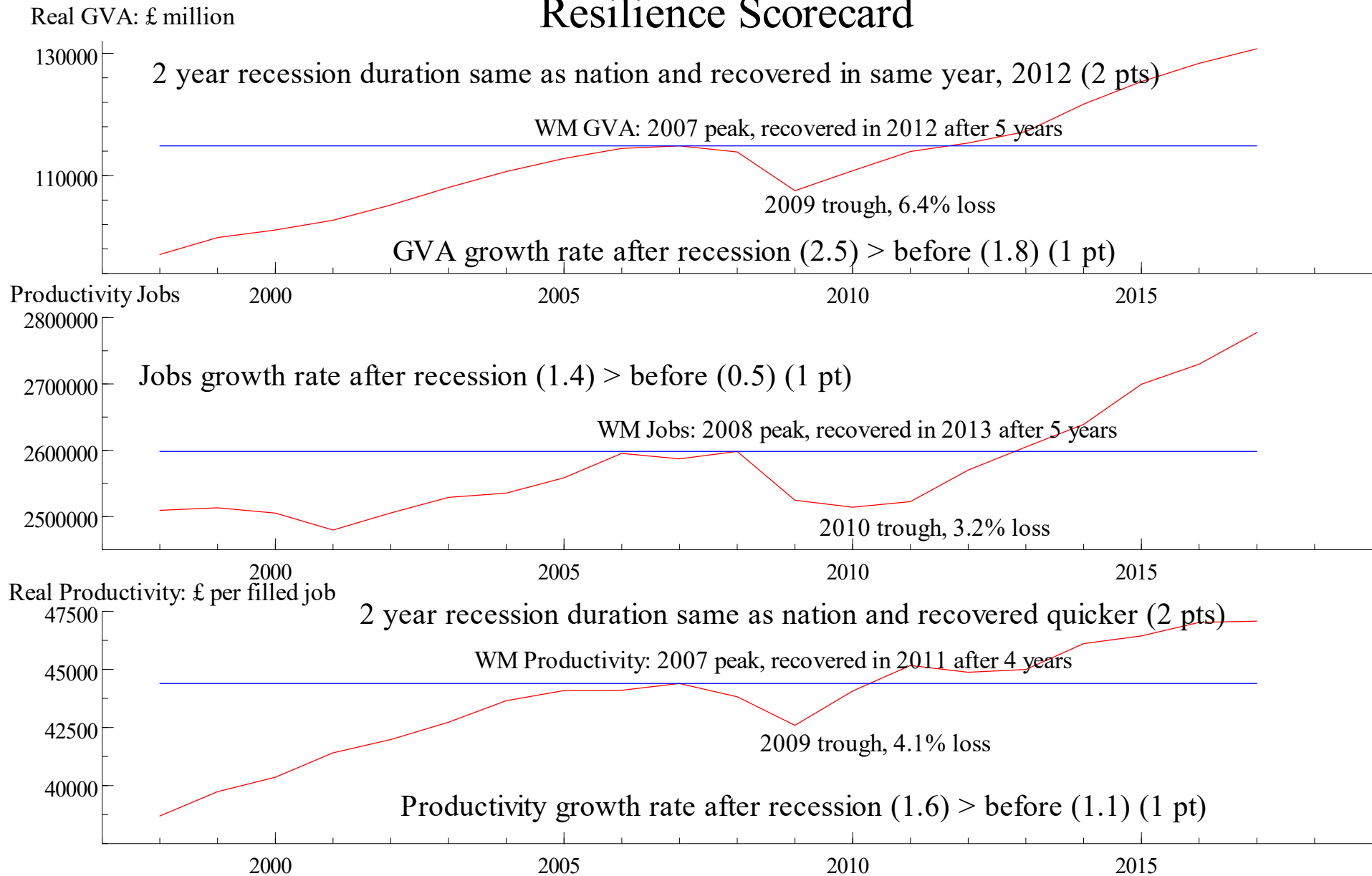


Out of a total of 12 points:

1. South East (10 points), only PrdJobs Beta >1 and prd rate of growth lower after recession.
2. South West (9 points).
3. East Midlands and West Midlands (7 points).
4. North West, East of England, Wales and Scotland (6 points).
5. London (5 points).
6. North East and Northern Ireland (3 points).
7. Yorkshire and the Humber (2 points).

West Midlands: NUTS 1 region

Resilience Scorecard



- For GVA, 13/40 NUTS 2 regions were more resistant than the nation, and only 9/40 had higher growth rates after recession.
- Jobs, 8/40 NUTS 2 regions were more resistant than the nation, but 23/40 had higher growth rates after recession.
- Productivity, 15/40 NUTS 2 regions were more resistant than the nation, but only 6/40 had higher growth rates after recession.

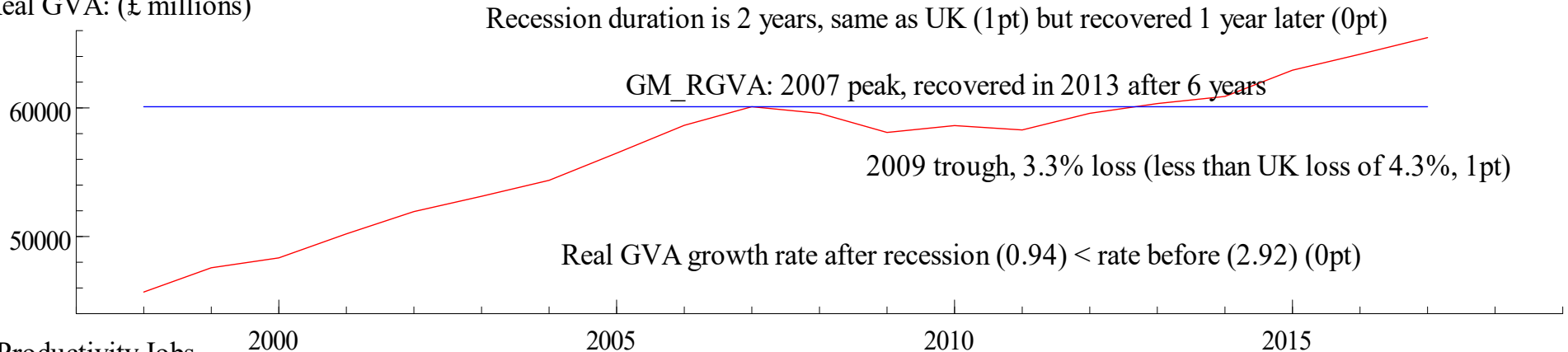
Out of a total of 12 points, rank of regions:

- 1.** Berkshire, Buckinghamshire and Oxfordshire, (UKJ1) South East, 10 points.
- 2.** Cumbria (UKD1); Surrey, East & West Sussex (UKJ2); Hampshire & The Isle of Wight (UKJ3); Gloucestershire, Wiltshire and Bath/Bristol area (UKK1), 9 points.
- 3.** Lincolnshire (UKF3); NE Scotland (UKM5), 8pts.
- 4.** Derbyshire and Nottinghamshire (UKF1); Inner London – West (UKI3); Inner London – East (UKI4), 7 pts.
- 5.** Greater Manchester (UKD3); Cheshire (UKD6); West Midlands (UKG3); East Anglia (UKH1); Outer London - West and North West (UKI7); Kent (UKJ4); East Wales (UKL2); Highlands & Islands (UKM6); Eastern Central Scotland (UKM7); West Central Scotland (UKM8), 6 pts.

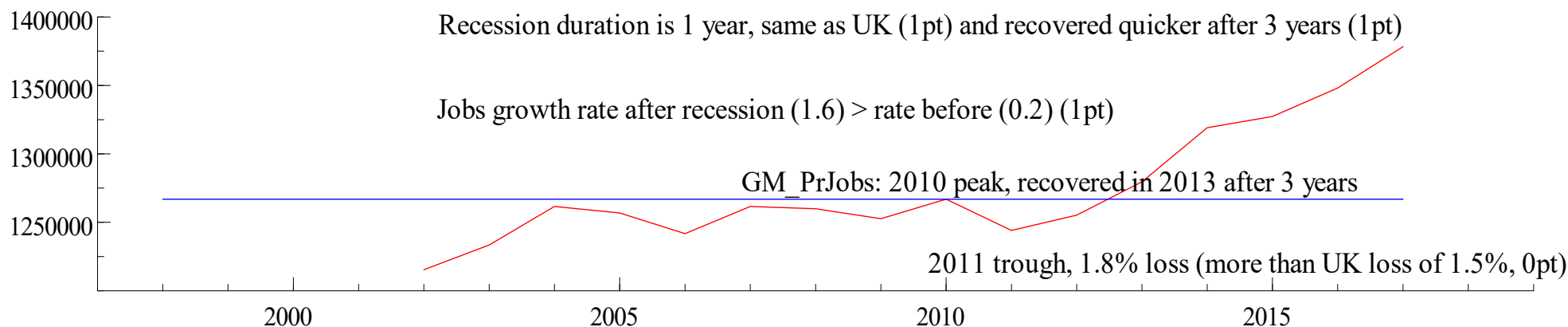
Greater Manchester: NUTS 2 region

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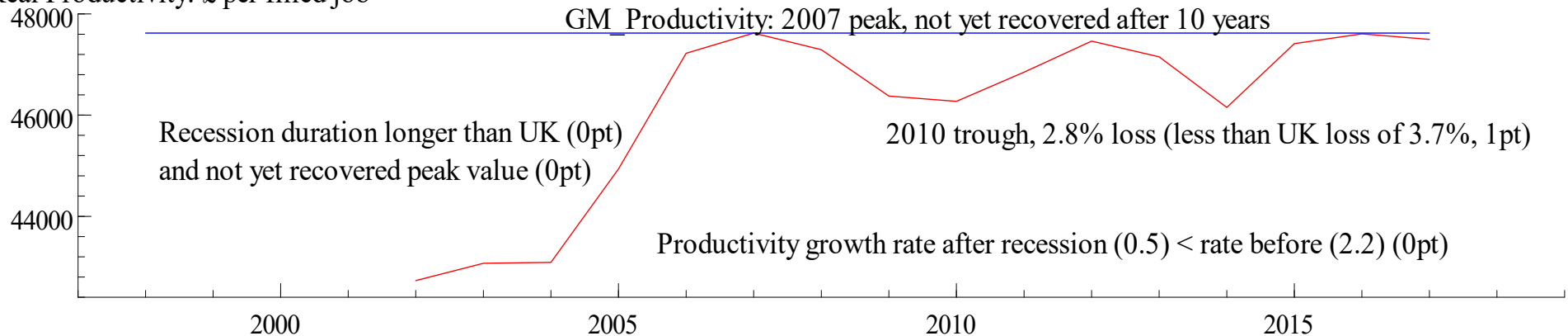
Real GVA: (£ millions)



Productivity Jobs



Real Productivity: £ per filled job



The second part of the scorecard:

- 6.** Tees Valley and Durham (UKC1); Shropshire and Staffordshire (UKG2), 5 points.
- 7.** Herefordshire, Worcestershire and Warwickshire (UKG1); Outer London - East and North East (UKI5); Dorset and Somerset (UKK2); Southern Scotland (UKM9), 4 points.
- 8.** North Yorkshire (UKE2); Leicestershire, Rutland and Northamptonshire (UKF2); Essex (UKH3); Cornwall and Isles of Scilly (UKK3); West Wales and The Valleys (UKL1), 3 points.
- 9.** Lancashire (UKD4); Merseyside (UKD7); South Yorkshire (UKE3); West Yorkshire (UKE4); Bedfordshire and Hertfordshire (UKH2); Outer London – South (UKI6); Devon (UKK4), 2 points.
- 10.** Northumberland & Tyne and Wear (UKC1), East Yorkshire & Northern Lincolnshire (UKE1), 1 pt.

We assess regressions for the resilience statistics and the following factors that affect resilience:

- NVQ4plus: share of people in a regions with NVQ4+ qualifications, from NOMIS.
- Krugman specialisation index, calculated by the

ONS as:

$$KSI_j = \sum ABS \left[\frac{X_{ji}}{X_j} - \frac{(X_i - X_{ji})}{(X - X_j)} \right]$$

where X_{ji} is the output of region (j) in industry (i), X_j is the total output of region (j), X_i is the total output of industry (i) and X is the national output.

- Unemployment rate of region from NOMIS.

Results from cross-section regressions

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- Expansion before recession, GVA, Jobs and productivity: Krugman index is positive so more specialisation is associated with greater growth.
- For loss during recession, GVA: higher share of skilled workers in areas have lower loss.
- For loss during recession, Jobs: longer duration of recession is related to greater loss areas and Krugman index is positive so more diverse regions have greater job losses.
- For loss during recession, Productivity: areas earlier into recession and with higher unemployment rates have greater loss.

- Expansion after recession, GVA: the longer the recovery the less growth, increase in number of new enterprises (between 2009-2010) positively affects growth.
- Expansion after recession, Jobs: the longer the recovery the less jobs growth, higher unemployment level (2010-12) and larger amount of higher skilled related to greater growth.
- Expansion after recession, Productivity: longer recession and higher unemployment level negatively affects growth.

- Most NUTS 1 regions have recovered pre-recession peaks in productivity with exception of Yorkshire & Humberside.
- At NUTS 2 level 13/40 have NR. It is important to look at function economic areas, aggregation can cover up the local area business cycle.
- An analysis of regional economic resilience since the financial crisis will help in preparing local industrial strategies.
- The resilience scorecard is a useful tool for comparing areas to understand how regions have resisted, recovered and experienced renewal after facing an economic shock.