

# **Working Paper 14: Working Future**

## Employment projections for London by sector

by **Ellie Cooper**

December 2005



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## 1. Introduction

This working paper details the updating of the Volterra London employment projections. The last projections were produced in 2004 with a start year of 2002. Projections were produced for London at the 12-sector level. These projections have been updated using the same techniques as before, including another year of recorded data. This takes the new start year to 2003, with projections being taken forward to 2027. The first section in this note details the data revisions which have been made since the previous projections in 2004.

The economic theory which underpins the approach in this paper is described in detail in Appendix A of GLA Economics' *Working Paper 11: Working London* (2004). Essentially, it is based on standard models of economic growth.

### Data revisions

Projections are only as good as the data on which they are based. The data has been revised since Volterra made the projections in 2004. Table 1.1 shows these revisions. All data was supplied to Volterra by the Greater London Authority (GLA), and in turn supplied to them by Experian Business Strategies (EBS). The only exception to this is the 'previous data' for 2003 which is Volterra's previous projection based on the old EBS historic data.

Volterra use a trend-based approach to projecting, the exact methodology is described in Working Paper 11. Revisions to the most recent years of data therefore change the start point from which projections project, and revisions to more historic data alter the trends on which the projections are based. Describing data revisions is therefore of paramount importance in projecting.

Table 1.1 shows the data revision from 1982 onwards. From 1982 to 2001 the new data is an upward revision of the old data, suggesting there has been more employment in London than previously believed. Employment in 2002 has however been revised downwards by 32,000, having a predictable affect upon Volterra's projection of jobs in 2003 which was 38,000 higher than the recorded figure. These numbers have the effect of providing a lower start point for projections but a stronger overall positive trend.

**Table 1.1: Total London employment – Previous and revised data**

<b>Employment (‘000s)</b>	<b>Previous EBS data</b>	<b>Current EBS data</b>	<b>Absolute difference</b>	<b>% difference</b>
1982	4,034	4,041	7	0.17
1983	4,005	4,012	7	0.18
1984	4,057	4,064	7	0.17
1985	4,084	4,090	7	0.16
1986	4,068	4,073	5	0.11
1987	4,135	4,141	6	0.14
1988	4,218	4,227	9	0.21
1989	4,221	4,229	8	0.19
1990	4,153	4,162	9	0.23
1991	3,929	3,942	13	0.34
1992	3,746	3,768	22	0.59
1993	3,715	3,740	25	0.68
1994	3,815	3,845	30	0.78
1995	3,867	3,896	29	0.75
1996	3,923	3,946	22	0.57
1997	4,039	4,056	18	0.43
1998	4,172	4,194	22	0.53
1999	4,317	4,336	19	0.44
2000	4,494	4,509	15	0.34
2001	4,522	4,546	24	0.53
2002	4,480	4,448	-32	-0.71
2003	4,518	4,480	-38	-0.84

Source: EBS

Table 1.2 sets out the previous and revised data for London Gross Value Added (GVA), also supplied by the GLA and provided to them by EBS. The directly comparable numbers should be the growth rates as the absolute numbers are in different years constant prices. These have been revised much less than the employment numbers. However revisions start in 1996, and from this year to 2000, where there are revisions, they are positive (i.e. increases). From 2001 onwards the revisions to GVA are negative (i.e. decreases).

**Table 1.2: London GVA – Previous and revised data**

<b>GVA (£bn)</b>	<b>Previous EBS GVA ('95 prices)</b>	<b>Current EBS GVA ('01 prices)</b>	<b>GVA growth (%) using Previous</b>	<b>GVA growth (%) using Current</b>	<b>Absolute difference in growths</b>
1982	95.7	98.5			
1983	99.0	102.0	3.5	3.5	0.0
1984	99.2	102.2	0.2	0.2	0.0
1985	102.1	105.2	2.9	2.9	0.0
1986	106.6	109.8	4.4	4.4	0.0
1987	110.9	114.3	4.1	4.1	0.0
1988	116.2	119.7	4.7	4.7	0.0
1989	117.1	120.6	0.8	0.8	0.0
1990	116.9	120.5	-0.1	-0.1	0.0
1991	112.9	116.4	-3.4	-3.4	0.0
1992	111.4	114.8	-1.3	-1.3	0.0
1993	114.0	117.5	2.3	2.3	0.0
1994	120.3	124.0	5.5	5.5	0.0
1995	123.5	127.4	2.7	2.7	0.0
1996	126.1	130.2	2.1	2.3	0.2
1997	130.5	134.8	3.5	3.5	0.0
1998	137.9	142.4	5.7	5.6	0.0
1999	143.7	149.0	4.2	4.6	0.5
2000	151.2	157.9	5.2	6.0	0.8
2001	155.0	160.6	2.5	1.7	-0.9
2002	156.0	159.3	0.7	-0.8	-1.5
2003		160.5		0.8	
Average GVA growth 1982-2003 (%):			2.5	2.5	

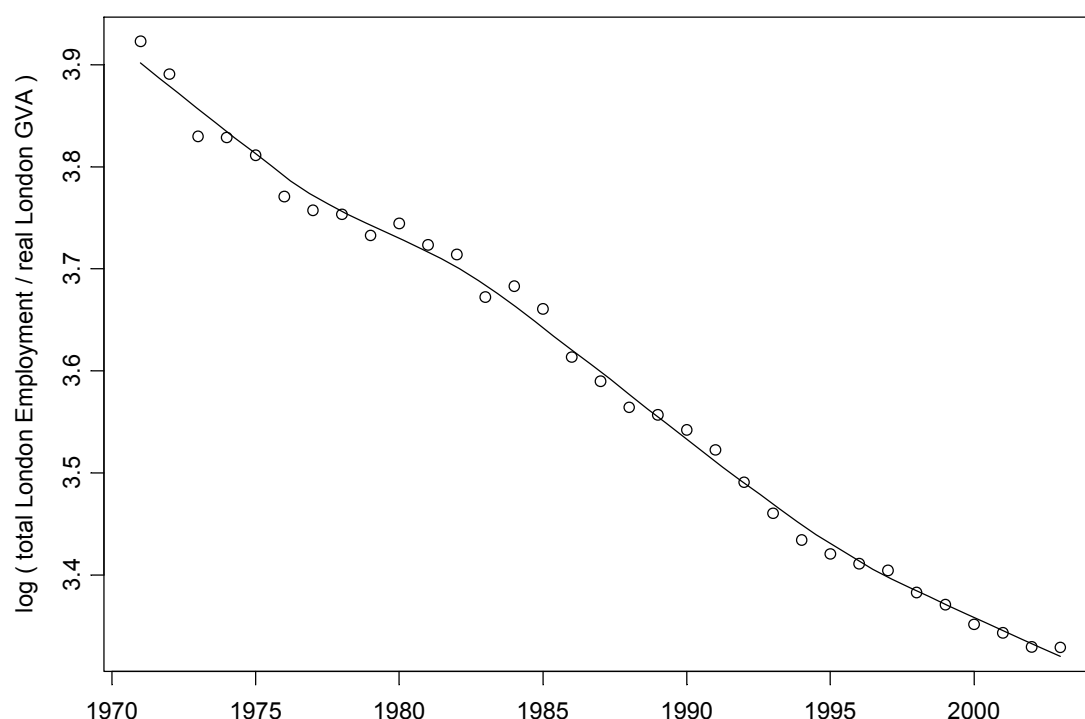
Source: EBS

Apart from the year 2001, the GVA revisions are in the same direction as the employment ones. That is to say that where GVA has grown more than previously believed, employment levels have also been revised to be higher. This is not surprising as the estimations for employment numbers and GVA figures are closely linked. The year 2001 however sees an upward revision to employment but a downward revision to GVA.

## 2. Total London employment projections

The overall London employment projection are reviewed. The technique used is to examine the ratio of total London employment to total London output. This is shown in Figure 2.1 as a logged ratio. On such a chart, the gradient is equal to the growth that would be required to maintain stable employment.

**Figure 2.1: Log of total employment as a proportion of total output in London**



Overlaid on the chart is a fitted local regression curve, highlighting the historic trend. It can be seen that the last three years of recorded data, 2001, 2002 and 2003, fit the trend quite closely.

As discussed in the previous section, the data on which the projections are based is frequently revised. As can be seen in Table 1.1, the most recent years' data points are liable to have the largest revisions made to them and therefore are the least reliable on which to base projections. For this reason, different trends for the medium-term (to 2016) projections are used rather than for the long-term (to 2026) projections. In the medium term, equal weight is put on the long- (since 1971) and short- (since 1994) term trends. In the longer term however, in order to try and avoid constant alterations to the projections, higher weighting (70 per cent) is put on the long-term trend, since this is more stable and prone to less alteration, and less weight (30 per cent) is put on the short-term trend.

In the medium term, to 2016, the growth required for stable employment is equal to 1.55 per cent per annum. This is equal to half of the linear fitted trend from 1994 to 2003 and half of the longer-term trend from 1971 to 2003. This is therefore equal to



the productivity growth of workers in London. Taking the long-term projected output growth at 2.5 per cent, the implied short-term employment growth is equal to 0.95 per cent per annum. This gives rise to a total employment increase of 207,000 in the five years between 2003 and 2008. Looking at the medium-term picture, this gives rise to total employment growth of 558,000 between 2003 and 2016.

In the long term, to 2026, the growth required for stable employment rises to 1.7 per cent per annum. This is equal to 70 per cent of the linear fitted trend from 1971 and 30 per cent of the shorter-term trend from 1994 to 2003. Taking our long-term projected output growth of 2.5 per cent this gives rise to a total employment increase of 970,000 between 2003 and 2026, equal to 22 per cent of total employment in 2003.

These employment growths between 2003-2016 and 2003-2026 compare to previously projected rises of 503,000 and 920,000 over the same periods. The reason for the difference between these absolute growths is primarily due to the fact that the data for 2002 has been downgraded by 32,000 jobs. The previous higher 2002 figure led to a more optimistic projection value for 2003 which meant starting the projections at an employment point 38,000 higher than the actual recorded number for 2003.

Total employment for London from 2000 to 2003 is now recorded at 4.51 million, 4.55 million, 4.45 million and 4.48 million. Given the drop in employment between 2001 and 2002, there is an argument for taking an average of several of the most recent years as the start point for employment growth; the most recently recorded year does not match the long-term expected trend. If an average of total employment between 2001 and 2003 was taken, there would be a theoretical start employment level of 4.49 million, which is only 11,000 higher than the 2003 recorded figure. Therefore 2003 was kept as the actual start point for the projections.

### 3. London sector employment projections

The same technique was adopted for projecting employment broken down at the 12-sector level as for total employment; by looking at the historic ratio of employment to London output. Total London output is used instead of local sectoral growth rates, as these are estimated on the basis of employment, which would lead to a circular argument. The historic data used for the projections is supplied to us by the GLA, originally from EBS and based on Office for National Statistics figures.

Taking each of the sectors in turn, breaks in the historic trend of log employment divided by output are identified. The full set of these charts can be found in Appendix A. Depending on the characteristics of the historic trend, a year is identified from which the trend up until 2002 best represents the likely future trend. In several cases, the average of two trends is taken, where it is felt that future growth is more likely to be somewhere between a short- and long-term historic trend.

Trend-based projecting has been used here for all sectors with the exception of business services. If either the long-term trend (since 1971) or the shorter-term trend (1992) for business services were allowed to continue the sector would grow by between 3.7 and four per cent per annum into the future. Taking the long-term trend forward, the 2003 level of 1.08 million would increase to around 2.61 million in 2026, an increase of 1.53 million. This would account for more than 40 per cent of London employment. It is not believed that such a trend can continue. The 11 other employment sectors were allowed to grow at the trend-based rates, and constrain business services as the remainder against the total London employment projections.

By putting more weight on the long-term trend in the long-term projections, a slight slowing of employment growth is projected to occur from 2016 onwards. As business services is a residual of the total employment less the other 11 sectors, if the other 11 sectors are allowed to continue completely with trend, then business services will effectively take this whole slowdown from 2016 onwards. It is not thought that this is realistic and therefore growth in all sectors is constrained to slow down in 2016 in line with the reversion to the long-term trend projected to occur for total London employment.

Table 3.1 shows which trends have been used for each of the 12 sectors up to 2016, along with the associated growths. Taking long-term output to be equal to 2.5 per cent, it can be seen that other services is the fastest growing sector, at 2.7 per cent, being one of only two sectors that does not require overall output growth in order for employment in the sector to grow. This is closely matched by hotel, bars and restaurants employment, at 2.6 per cent, and business services at 2.3 per cent.

The worst performing London sectors are manufacturing and primary and utilities, falling at 2.9 per cent and 2.1 per cent respectively.

**Table 3.1: Summary of trends used to 2016 for sector based projections**

<b>Sector</b>	<b>Trend for projection to 2016</b> (only last two digits of each year used, e.g. 2003 = 03)	<b>Growth required for stable employment</b>	<b>Long term growth with output at 2.5% PA</b>
Primary & Utilities	from 97 to 03	4.6	-2.1
Manufacturing	from 91 to 03	5.4	-2.9
Construction	from 89 to 03	4.4	-1.9
Wholesale	½ trend from 71 to 03 ½ trend from 92 to 03	1.9	0.6
Retail	from 84 to 03	1.7	0.8
Hotels & Restaurants	from 71 to 03	-0.1	2.6
Transport & Communications	½ trend from 80 to 03 ½ trend from 91 to 03	3.0	-0.5
Financial services	from 88 to 03	1.8	0.7
Business services	NA (residual of total employment)	-0.2	2.3
Public administration	½ trend from 82 to 03 ½ trend from 91 to 03	4.3	-1.8
Health & Education	from 91 to 03	2.0	0.5
Other services	from 91 to 03	-0.2	2.7
Total employment	½ trend from 71 to 03 ½ trend from 94 to 03	1.6	0.9

Source: Volterra

With these growth rates calculated, the revised sectoral employment projections can be produced, as presented in Table 3.2. The changes to employment remain broadly in line with previous projections. For four of the sectors the projected change in employment in employment between 2003 and 2016 has altered by more than 10,000.

- Retail sees growth increase from 33,000 to 43,000 reflecting a stabilisation in the shorter-term trend – retail employment declined for a few years from 2000-2002 but has recently appeared to have stabilised.
- Hotels, bars and restaurant employment sees growth increase from 105,000 to 121,000 reflecting persistence of the short-term trend.
- Business Services sees a rise of 363,000 rather than 325,000. This is due to the revision of the historic data, making the starting point lower and the growth rates higher.
- Other Services grows by 20,000 less than previously. This reflects a slight slowing in this sector in recent years.

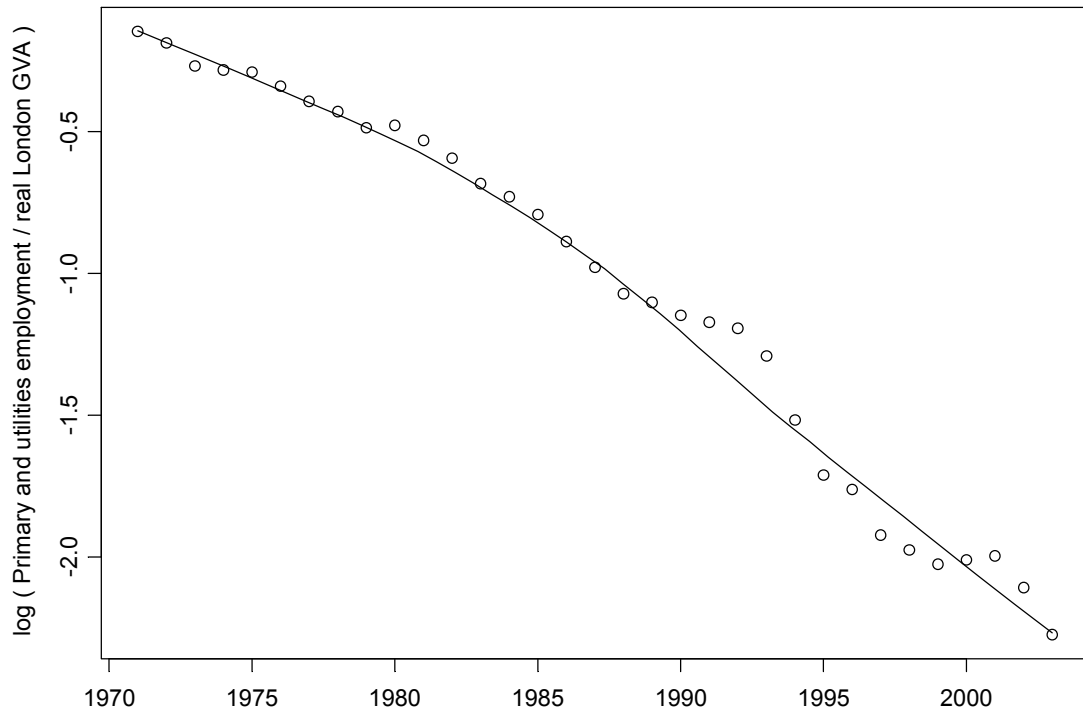
**Table 3.2: London sectoral employment: History 2001-2003; Projections 2004-2026, assuming output growth of 2.5% per annum**

<b>GVA Growth = 2.5% pa, (000s)</b>	<b>Primary &amp; Util.</b>	<b>Manufact.</b>	<b>Construction</b>	<b>Wholesale</b>	<b>Retail</b>	<b>Hotels &amp; Rests.</b>	<b>Transport &amp; Comms</b>	<b>Financial services</b>	<b>Business services</b>	<b>Public admin</b>	<b>Health &amp; Education</b>	<b>Other services</b>	<b>Total</b>
2001	22	299	210	254	404	288	372	360	1,120	210	634	372	4,546
2002	19	273	211	250	396	297	352	346	1,069	223	641	371	4,448
2003	17	267	232	239	396	309	351	338	1,075	233	661	361	4,480
2004	16	259	228	241	399	317	349	340	1,107	229	664	371	4,521
2005	16	251	224	242	402	325	347	343	1,137	225	668	381	4,562
2006	15	244	220	243	406	334	346	345	1,168	221	671	391	4,603
2007	15	237	215	245	409	342	344	348	1,197	217	674	402	4,645
2008	15	230	211	246	412	351	342	350	1,226	213	678	413	4,687
2009	15	223	207	247	416	360	340	353	1,255	209	681	424	4,730
2010	14	217	204	248	419	369	338	355	1,283	206	684	435	4,773
2011	14	210	200	250	422	379	336	358	1,310	202	688	447	4,816
2012	14	204	196	251	426	389	335	360	1,337	198	691	459	4,860
2013	13	198	192	252	429	398	333	363	1,363	195	695	471	4,904
2014	13	192	189	254	433	409	331	366	1,389	191	698	484	4,948
2015	13	187	185	255	436	419	329	368	1,414	188	702	497	4,993
2016	13	181	182	256	440	430	327	371	1,438	185	705	511	5,039
2017	12	176	178	257	443	440	325	373	1,460	181	708	524	5,078
2018	12	171	175	258	446	451	323	375	1,482	178	710	537	5,118
2019	12	165	171	260	449	462	321	378	1,503	174	713	551	5,159
2020	11	160	168	261	452	474	319	380	1,523	171	716	565	5,199
2021	11	155	165	262	455	485	317	382	1,542	168	718	580	5,240
2022	11	151	161	263	458	497	315	384	1,561	165	721	595	5,281
2023	11	146	158	264	461	509	313	387	1,579	162	724	610	5,323
2024	10	142	155	265	464	522	311	389	1,596	159	726	626	5,365
2025	10	137	152	266	467	534	309	391	1,613	156	729	642	5,407
2026	10	133	149	267	471	547	307	394	1,629	153	732	659	5,450

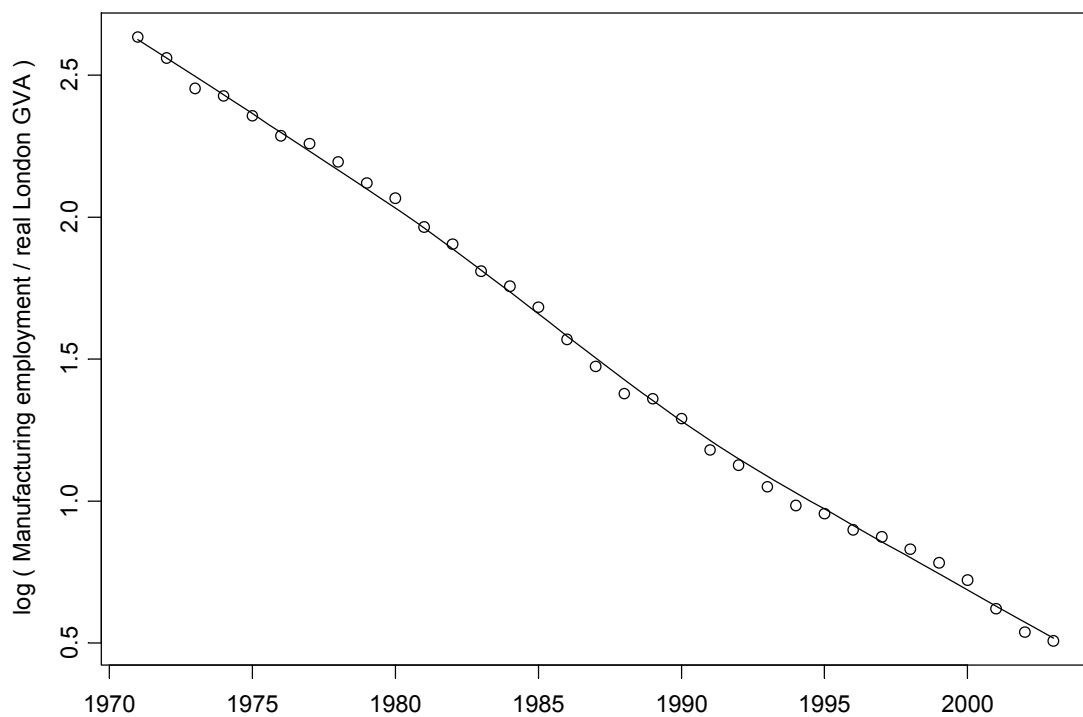
Source: Volterra

## Appendix A: Historic sectoral employment charts

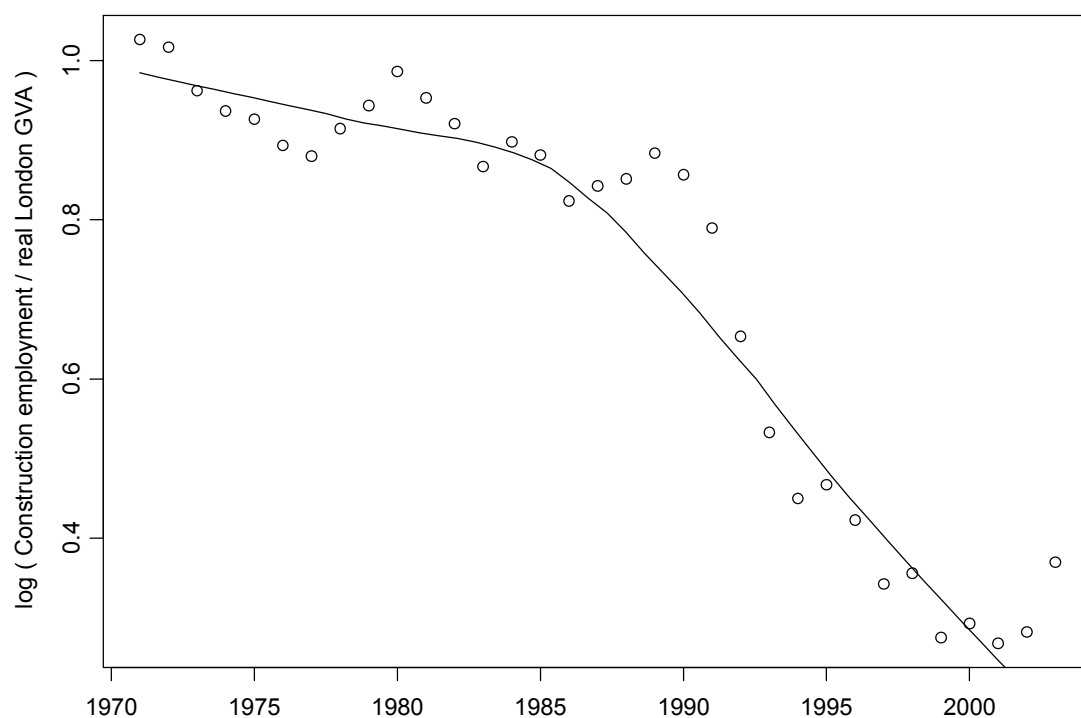
**Figure A1: Log of primary and utilities employment as a proportion of total output in London**



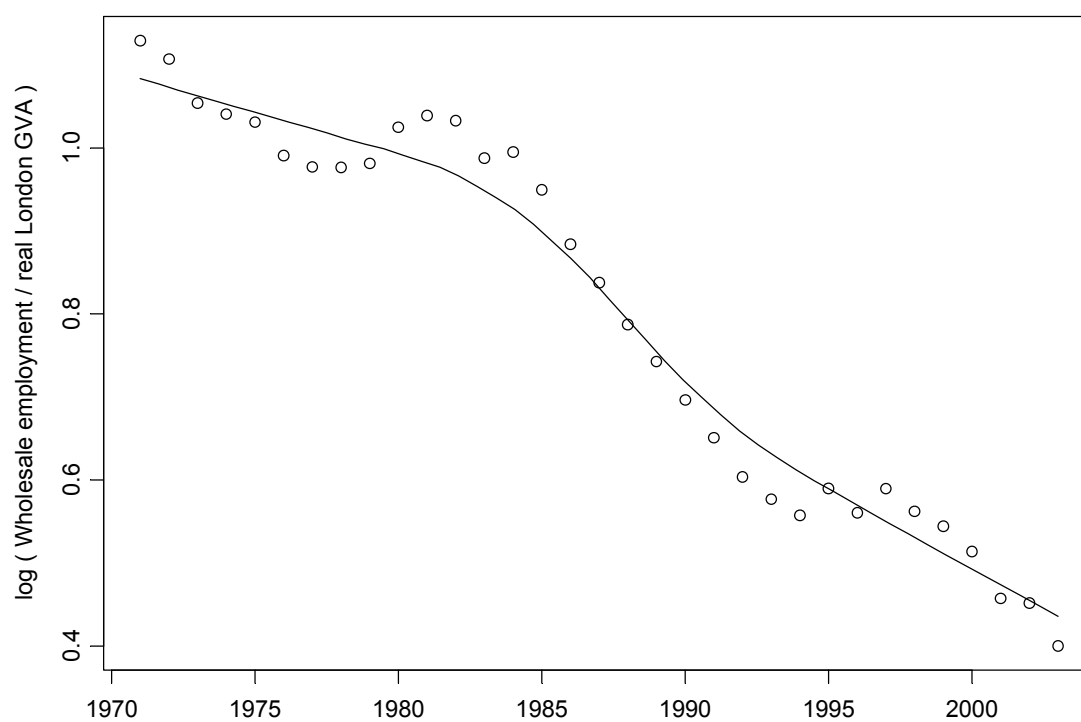
**Figure A2: Log of manufacturing employment as a proportion of total output in London**



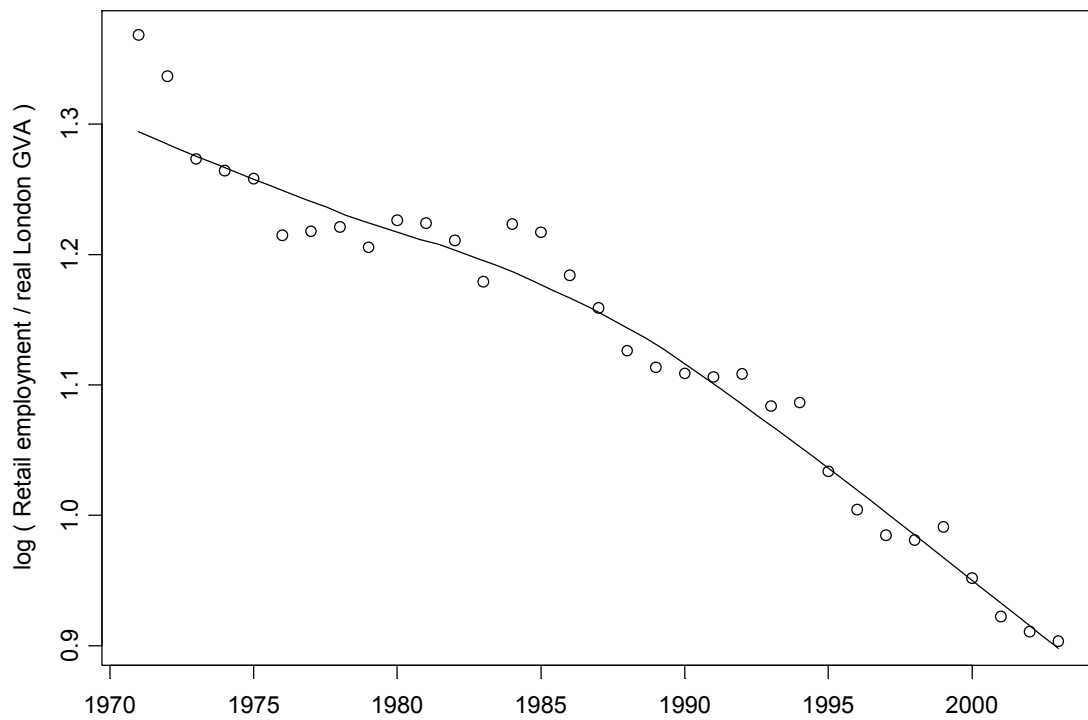
**Figure A3: Log of construction employment as a proportion of total output in London**



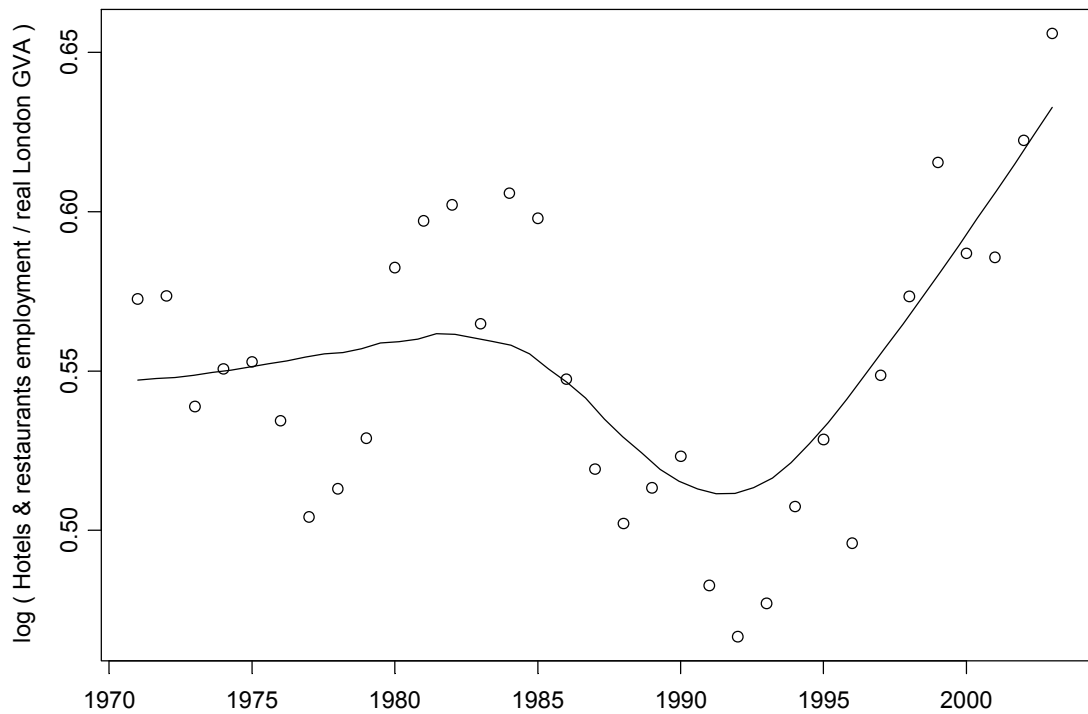
**Figure A4: Log of wholesale employment as a proportion of total output in London**



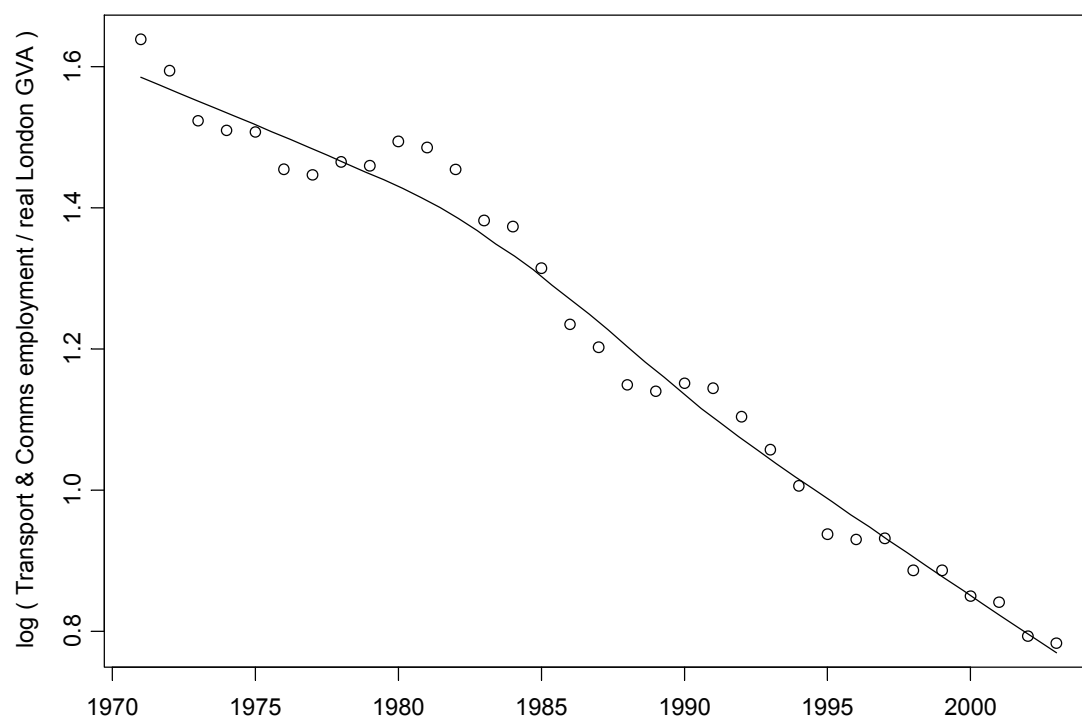
**Figure A5: Log of retail employment as a proportion of total output in London**



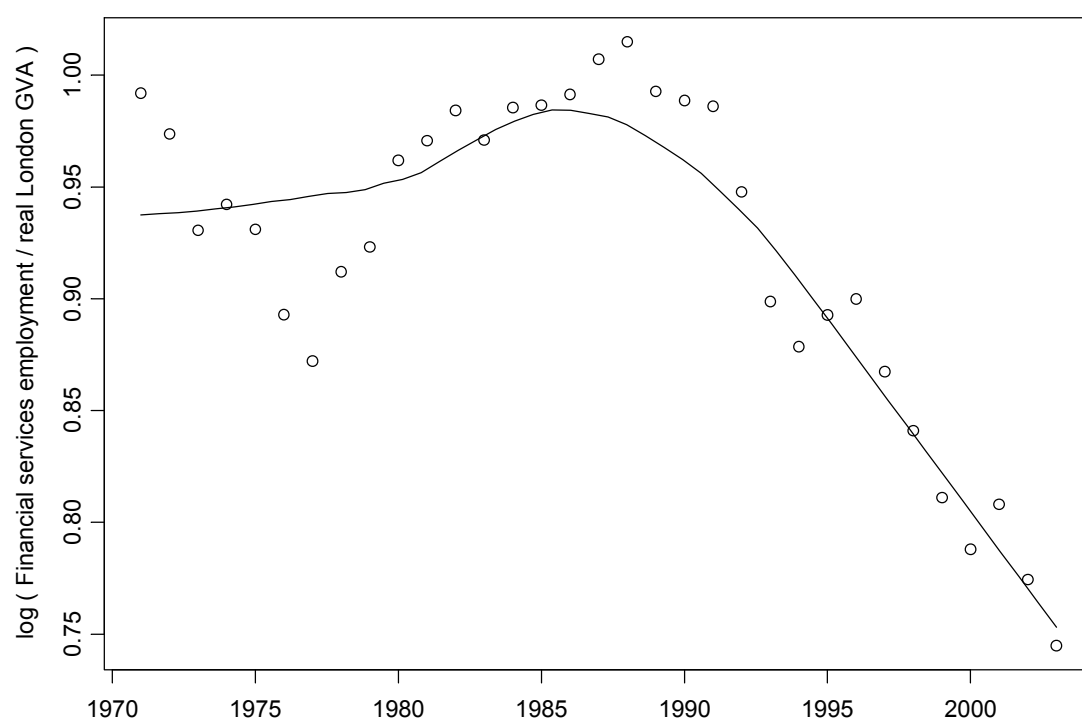
**Figure A6: Log of hotels, bars and restaurant employment as a proportion of total output in London**



**Figure A7: Log of transport and communication employment as a proportion of total output in London**

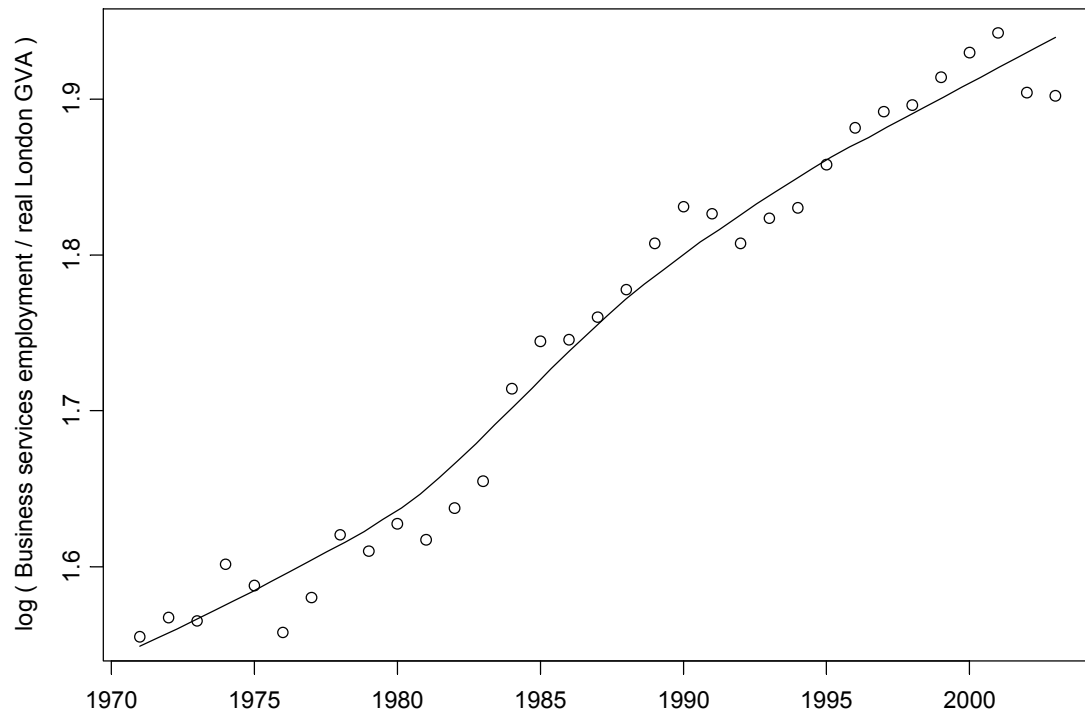


**Figure A8: Log of financial employment as a proportion of total output in London**

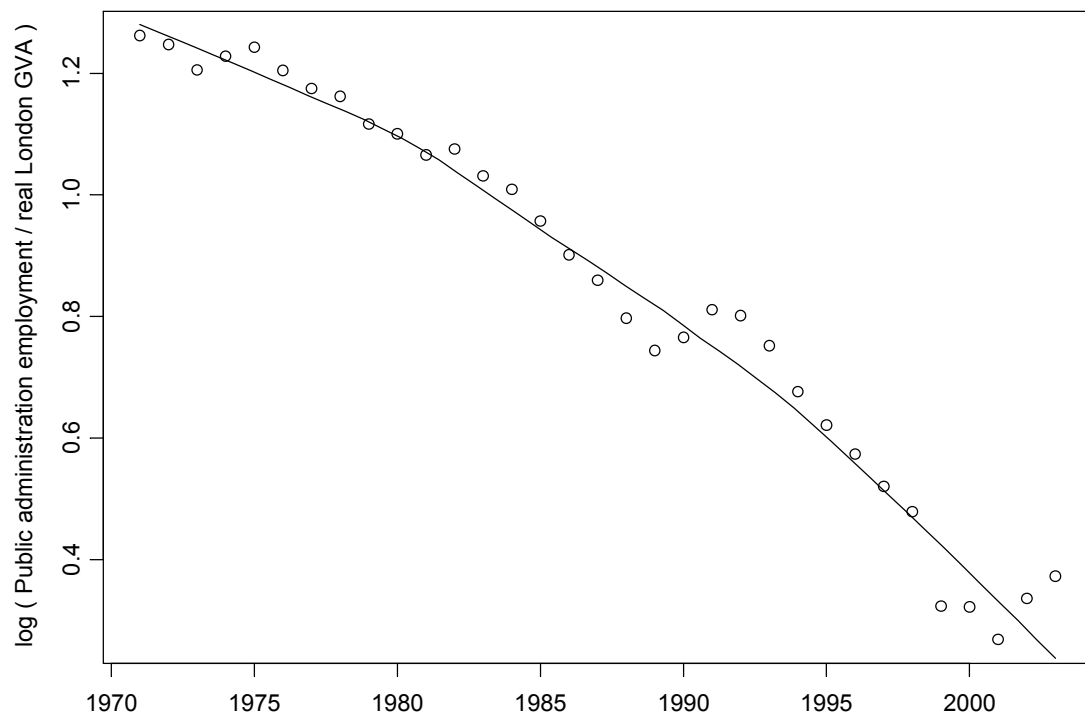




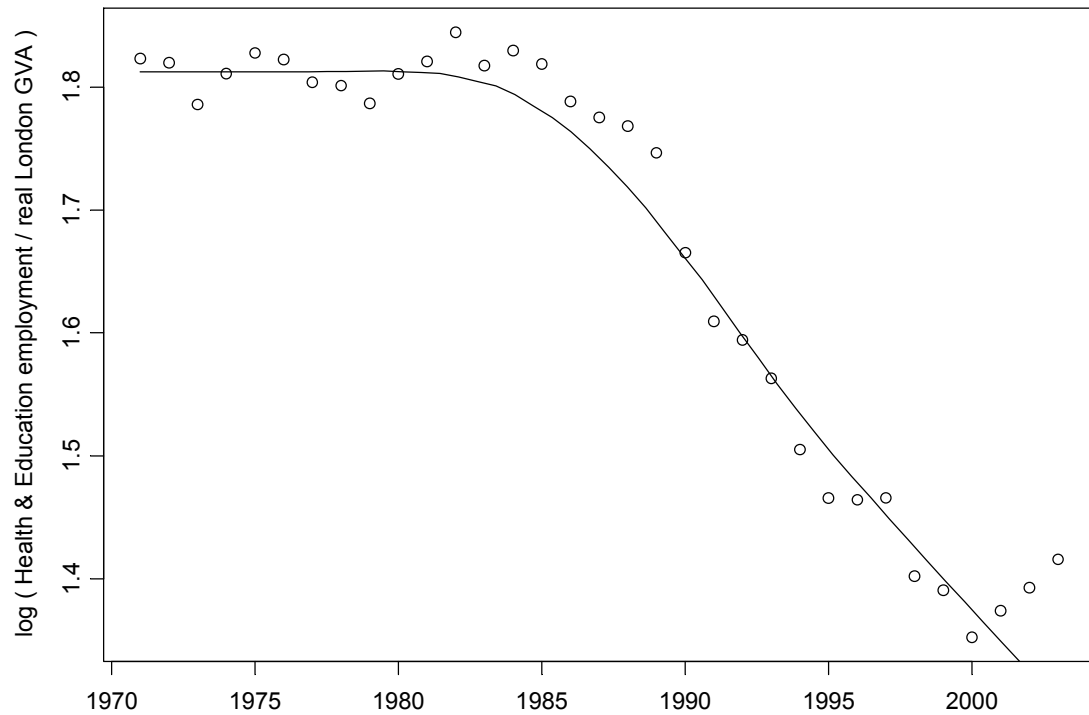
**Figure A9: Log of business service employment as a proportion of total output in London**



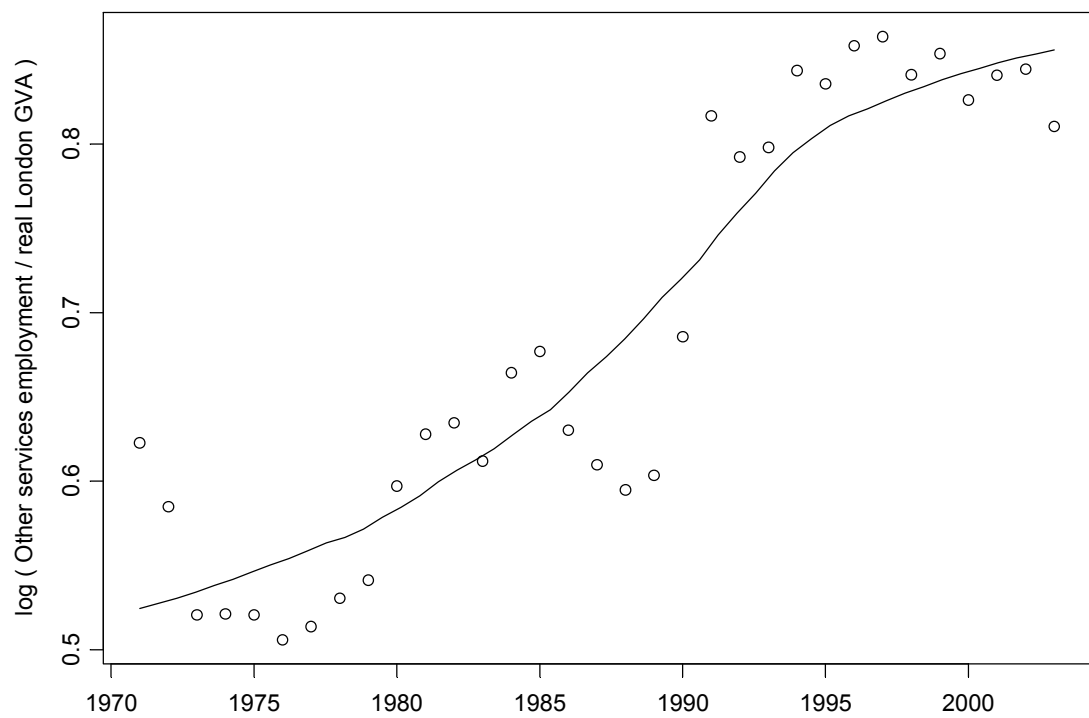
**Figure A10: Log of public administration employment as a proportion of total output in London**



**Figure A11: Log of health and education employment as a proportion of total output in London**



**Figure A12: Log of other services employment as a proportion of total output in London**



## **Abbreviations**

bn	Billion
EBS	Experian Business Strategies
GLA	Greater London Authority
GVA	Gross Value Added

## **References**

GLA Economics, 2004, Working Paper 11: Working London: Employment projections for London by sector, November 2004

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### Turkish

Bu belgenin kendi dilinizde hazırlanmış bir nüshasını edinmek için, lütfen aşağıdaki telefon numarasını arayınız

### Punjabi

ਜੇ ਤੁਹਾਨੂੰ ਇਸ ਦਸਤਾਵੇਜ਼ ਦੀ ਕਾਪੀ ਤੁਹਾਡੀ ਆਪਣੀ ਭਾਸ਼ਾ ਵਿਚ ਚਾਹੀਦੀ ਹੈ, ਤਾਂ ਹੇਠ ਲਿਖੇ ਨੰਬਰ 'ਤੇ ਫ਼ੋਨ ਕਰੋ ਜਾਂ ਹੇਠ ਲਿਖੇ ਪਤੇ 'ਤੇ ਰਾਬਤਾ ਕਰੋ:

### Hindi

यदि आप इस दस्तावेज की प्रति अपनी भाषा में चाहते हैं, तो कृपया निम्नलिखित नंबर पर फोन करें अथवा नीचे दिये गये पते पर संपर्क करें

### Bengali

আপনি যদি আপনার ভাষায় এই দলিলের প্রতিলিপি (কপি) চান, তা হলে নীচের ফোন নম্বরে বা ঠিকানায় অনুগ্রহ করে যোগাযোগ করুন।

### Urdu

اگر آپ اس دستاویز کی نقل اپنی زبان میں چاہتے ہیں، تو براہ کرم نیچے دیئے گئے نمبر پر فون کریں یا دیئے گئے پتے پر رابطہ کریں

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