More residents, more jobs?

The relationship between population, employment and accessibility in London

A Review of the Report from GLA Economics

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Summary

This report is an evaluation of the report by GLA Economics **More residents, more jobs? The relationship between population, employment and accessibility in London** which outlines a methodology for determining the number of additional jobs that might be gained in different London boroughs with respect to additional growth in population. It is found that the methodology is robust in that the method of extracting different types of jobs and associating this with accessibility is well founded. This is based on the notion that population always attracts local jobs, traditionally called services but that the level of local service jobs has to be extracted from the wider picture of service job location in Greater London. There are many service jobs that are associated with the wider attraction of Greater London and the GLA report seeks to show that if accessibility is associated with jobs in general, local jobs can be extracted by factoring out those jobs associated with high accessibility from the overall picture. This is a good methodology when the number of actual jobs associated with local population is unknown – which is invariably the case due to the absence of any such survey – and has to be determined indirectly. As the methodology is robust and the results plausible, this report considers the methodology useful and correct in determining additional jobs relevant to increased population proposed in various plans for London.

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Relationships between Employment and Population

If one examines total levels of employment and population at the city scale, it is rare to find all the population employed. More likely the ratio of population to employment which is variously called the activity or participation rate reflects households composed of retired individuals, non-working parents, children and populations who work elsewhere. This ratio has been falling in recent years as the birth rate has fallen and as larger numbers of women have entered the workforce. In Greater London for 2001, the ratio is about 1.6. It varies enormously of course at smaller spatial scales reflecting commuting and polarisation of activity in employment centres such as the City of London, and this means that transportation as measured by accessibility to different employment and population locations is an important causal variable in explaining the dependence of population on employment and vice versa at any particular place and at the local scale in general.

To determine this dependence, employment has traditionally been divided into that that generates goods and services which are exported outside the area of interest – so-called **basic employment** – and employment that generates goods and services for the local population – **non-basic employment**. If we had categorical definitions and measures of this kind of distinction, it would be an easy matter to separate out employment that was generated locally from the total and use the ratio of local employment to population to determine what would happen if population were to increase (or decrease). For example if 50 percent of employment were basic or non-local and 50 percent non-basic or local, and if the population increased without any growth in basic employment, due say to increased birth and falling death rates, then this would mean that for every 100 additional persons with a participation rate of say 1.6, of the 63 new jobs potentially associated with the new population, 31 would be in local services. This would give us our ‘rule of thumb’ for assessing increases or decreases in population and the effect on local jobs.

In fact in Greater London, the proportion of local services is likely to be a little lower than this 50 percent rate. In fact, one of the great difficulties is actually determining what proportion of all officially classified (SIC) service employment, is local. In industrial society, it was commonly regarded that in small places around factories, all services were local but in world cities like London, a very large proportion of employment is in services much of which in fact are non-local or basic. If no more than 33 percent of all employment is local services, then this would mean that for every additional 100 people, only 21 service jobs would be generated. The estimate is complicated by the fact that we do not know what proportion of services are basic and thus what are non-basic and our definition of local is complicated in a large city such as London. This means that the basic-non-basic approach which for many years has been used to figure out the dependence of local employment on the population, is no longer very useful.

A different approach is required, and this is what GLA Economics have developed using empirical data. In the next section, we outline their approach.

The GLA Methodology

1. Population, Employment and the Centre City Effect

The first stage is to determine how population depends on employment spatially and vice versa. In fact population and employment densities rather than absolute values of these variables are treated as this normalises the area effect. In fact when we compare densities with one another, this is no different from comparing absolute values as the area effect is common to each pair of variables and thus is factored out. I imagine that the use of density rather than absolute values is simply for convenience. The first analysis is to determine the relationships between population and employment densities at ward level from scatter diagrams. It is immediately apparent that despite a slight tendency for densities to covary, employment densities in the inner city and central city wards tend to be much higher than the rest while population densities tend to be lower. This in essence is due to commuting and the fact that London, like many cities, is structured so that the highest employment densities are in the core where there are low levels of population. The key idea here is that if we remove these wards which do not show any positive co-variation between employment and population, then this will remove those employment centres which are more likely to involve export-orientated employment, non-local and non-basic. When these central city wards are removed, the remaining wards do show a significant linear relation between population and employment densities but there is still substantial variation around the mean. This means that when we regress employment on population we get a gradient of 0.38 that implies that for an increase in every one person, we get 0.38 employment jobs, whereas if we regress population on employment, we get a gradient of 1.3. This implies that the equivalent gradient from this for employment on population is 0.77. This difference between 0.38 and 0.77 is simply due to the widespread variation around the simple linear relationship.

In essence, the method is taken further by suggesting that the variance in employment and population can be further reduced by factoring out further effects due to commuting and non-local services. In this sense, it might be objected that the method has already factored out global basic employment and what remains should be non-basic or population-dependent. In fact this cannot be the case because population inside the city seeks services which are non-local to their locality and although in terms of the overall city, these employments are ‘local’, in terms of any specific place, they are not. We need to factor out employment that is clustered at key points such as sub-centres of the metropolis and once these are identified, we can then be much surer that what remains is locally dependent. In short, what the methodology is doing is first removing the central city effects by identifying these explicitly in terms of location and second removing the local sub-city effects leaving what remains as truly local employment dependent on population. To do this, accessibility needs to be introduced.

2. The Local Accessibility Effect

The accessibility measure used was accessibility by public transport which is represented as the total population that is accessible to any place within 45 minutes of travel by public transport. This results in an accessibility value for each ward, and a visual representation which shows that accessibility increases unequivocally as one approaches the centre of the city. First a correlation matrix of employment, population and accessibility is generated and this shows that the relationship between accessibility and population and accessibility and employment are even stronger than between employment and population. If the relationship between each of these variables and accessibility is the same, then we would expect that the ratio of employment density to population density would remain invariant to changes in accessibility. In fact because employment density exerts a stronger effect, the ratio of employment to population increases slightly at higher levels of accessibility implying that there is still a non-local effect which is associated with larger employment densities. Thus to revisit the regression of employment on population, two levels of accessibility are defined. The scatter of points is subdivided into those that are associated with high and low levels of public transport accessibility. I do not know if the researchers experimented with the precise border line marking this subdivision into two levels and its effects on the scatter of employment and population, but there is very clear evidence that the scatter in the variation is substantially reduced if all those wards whose accessibility is to more than 1.7 million people, are removed form the data set. This leaves the relationship to be determined simply from the regression of all these observations of employment and population which have access to less than 1.7 million persons. Note that the central city wards at the onset of the analysis are still left out and it is not clear from the report if these would have been knocked out by this criterion anyway. I expect so.

It is clear from the analysis that the remaining observations are mainly in outer London where local dependence of employment on population and vice versa is much less likely to be complicated by centre and sub-centre accessibility effects. The report also notes that there are some areas of outer London such as the retail centres of Kingston, Croydon, Bromley etc and the industrial complex of Heathrow that still complicate the picture.

The Conclusions: The Key Relationship

Although the final estimating equation is not included in the report, this final regression of employment on population excluding central wards and all those wards with accessibility levels to more than 1.7m population yields a gradient of 0.23. The confidence bands of 33 and 66 percent yield gradients of 0.16 and 0.31. In short this means that for every 100 people added to wards like the ones in this analysis – i.e. mainly outer London, some 23 jobs would be added locally. In fact this is likely to be a lower estimate as some of the jobs in the excluded areas will serve these local populations.

There are important caveats in using this rule of thumb and the report makes this clear.

1. The rule of thumb must not be used for every small area.
2. It must be used for areas where population is to be added which are similar to those used in the analysis – i.e. mainly outer city areas, without major clusters of retail and industrial-service employment where the accessibility is in the bottom class below the threshold of access to more than 1.7m people.
3. There are limits to how far this rule is robust for an overall increase in the populations can only be supported in the long run if there is an increase in basic employment – that is in employment that is non-local.
4. Limits on how far the rule of thumb can be used have not been determined in this report and thus the method is most useful for assessing the effects on local of jobs of population change due to changes in the participation rate, aging (decreasing death rates), increased birth rates, and some immigration.

I should also stress that the method can be used symmetrically to assess what would happen if population decreased in a given area with consequent reductions in local service employment.

To summarise, ***the methodology used here is robust***. It appears to ***err on the conservative side***. Given the procedure and its rule of thumb – ***230 jobs for every additional 1000 population*** in areas where there is comparatively low accessibility, users should ***have confidence in its application***.