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The impact of E-substitution on the Demand for Mail: Some Results from the UK

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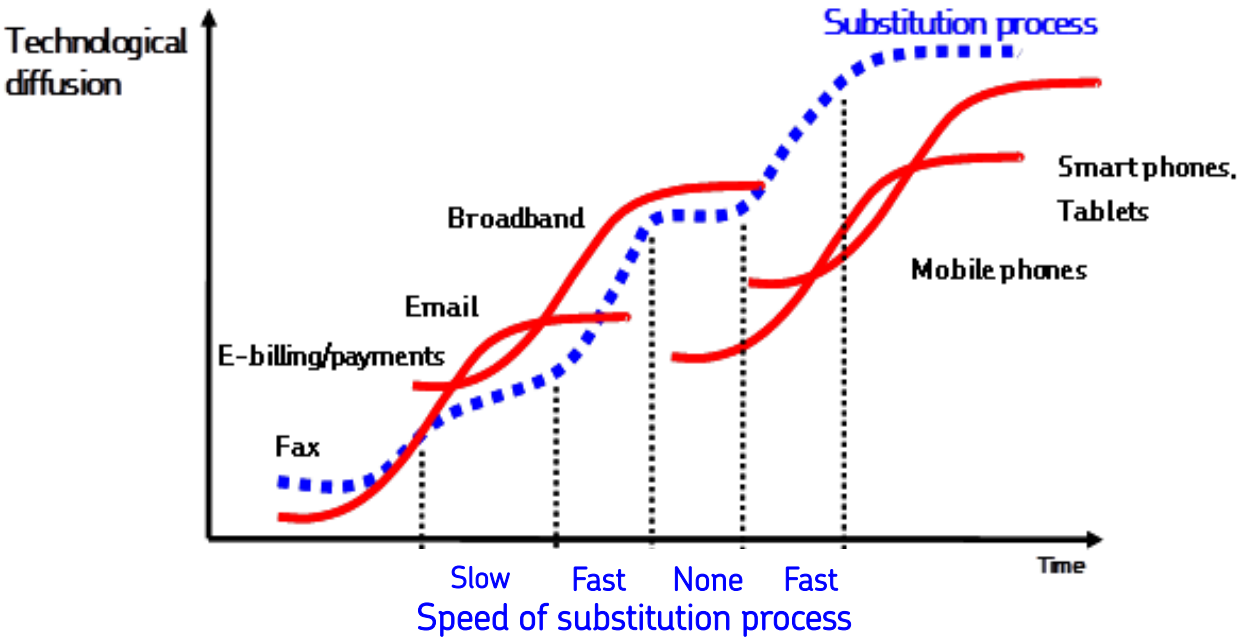
Introduction

- Letter mail and e-substitution
- Focus of our paper is empirical
- We consider trends in e-substitution for business mail:
  - In aggregate
  - By main sub-categories
- Importance of sender-recipient framework

Quantifying e-substitution



Source: Nikali (2008)

- Technologies underlying e--substitution develop and change
- Concept of "large corrugated S-curve" (Nikali, 2008)

How to quantify the impact of e-substitution?

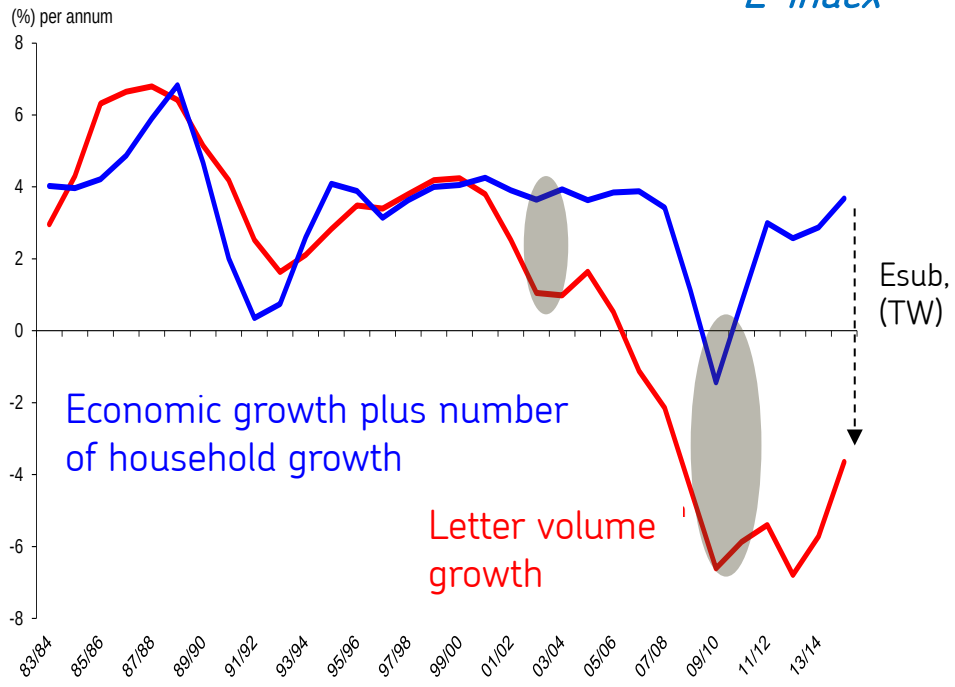
- We use econometric time series modelling of demand for mail
- In particular, we follow approach in Veruete-McKay et al. (2011) and make use of estimates of "unexplained" time trends identifying structural breaks and price elasticities

Econometric estimates for UK letter demand and e-substitution

1. Main findings from UK econometric time series models can be summarised by:

$$Q_t = Q_0\ (1+g.\ G_t)\ (1+p.\ P_t)\ \underbrace{E_t}_{\text{E-index}}$$

where $\hat{g} \cong \hat{p} \cong 1$

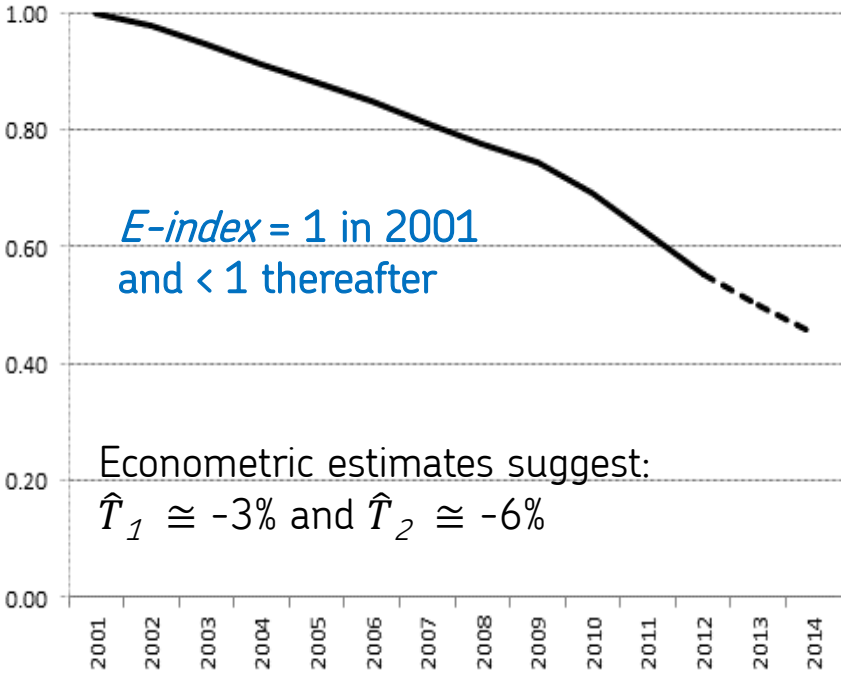


Note data refers to two year moving averages. Letter traffic refers to addressed inland traffic.

Source: Royal Mail Group and Office for National Statistics

2. Updated econometric estimates by Veruete-McKay et. al. (2011) used to generate our indicative *E-index*,

where $E_t \cong (1+T_1)^{n1t}\ (1+T_2)^{n2t}$



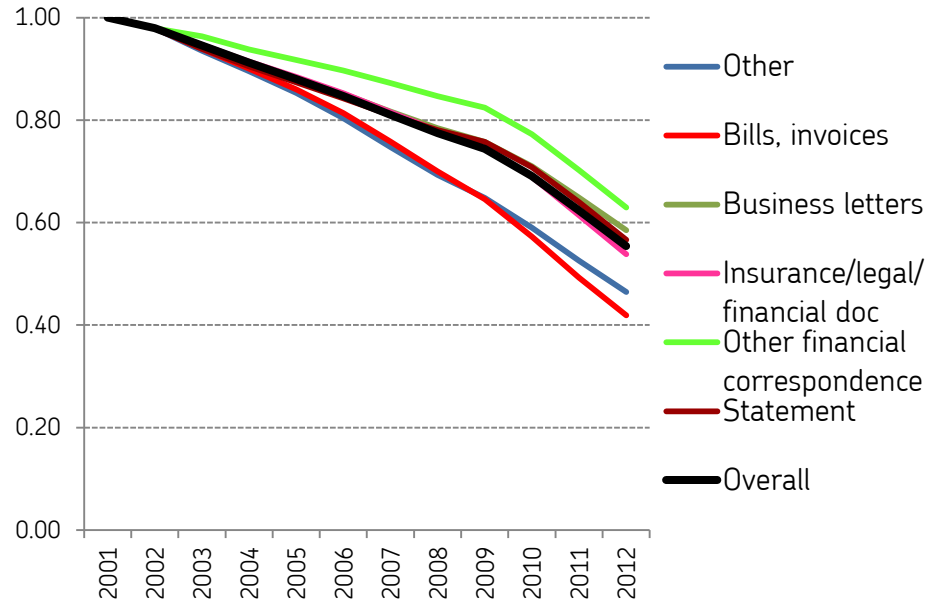
E_t = (1 - proportionate loss to e-substitution relative to 2001)

Disaggregated Estimates of E-substitution for B2C Business Mail

- B2C business mail accounts for close to half of UK total addressed inland letter traffic
- Our analysis disaggregates B2C business mail traffic by content type, sender group and age of recipient
- Data sourced from internal surveys
- Key assumptions in constructing disaggregated estimates of e-substitution:
  - E_t (econometrically derived for total business mail) used as a proxy index for B2C business mail
  - GDP and population elasticities equal across disaggregations
- Disaggregated indices for a particular segment calculated as:
  - E_t .(segment share in period t / segment share in 2001)
- Application of plausible constraints on estimates necessary to address noise in survey data when applying this approach

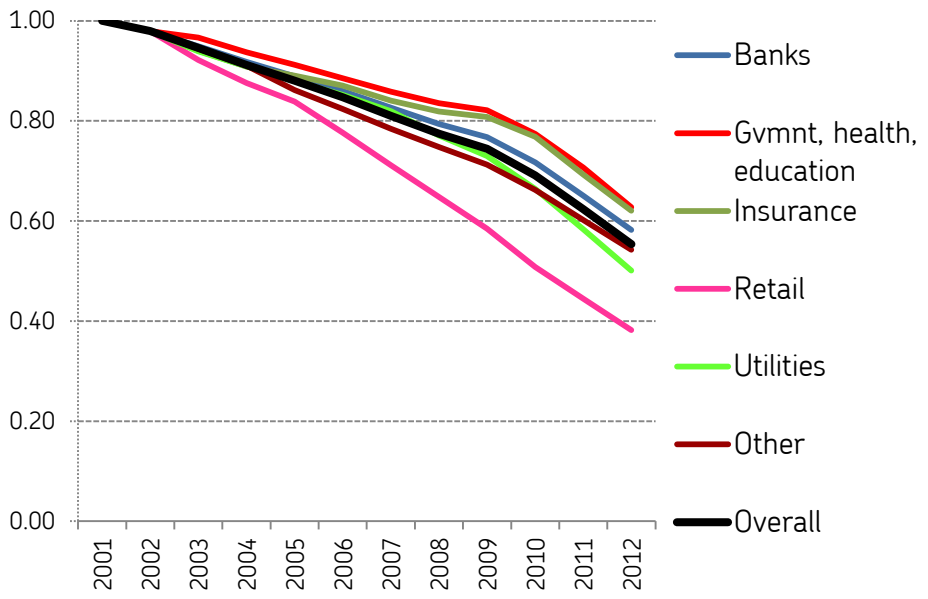
E-Index (E_t) estimates by letter content and sender group

E-index estimates by letter content, 2001 to 2012 (2001=1)



Source: Royal Mail

E-index estimates by sender group, 2001 to 2012 (2001=1)

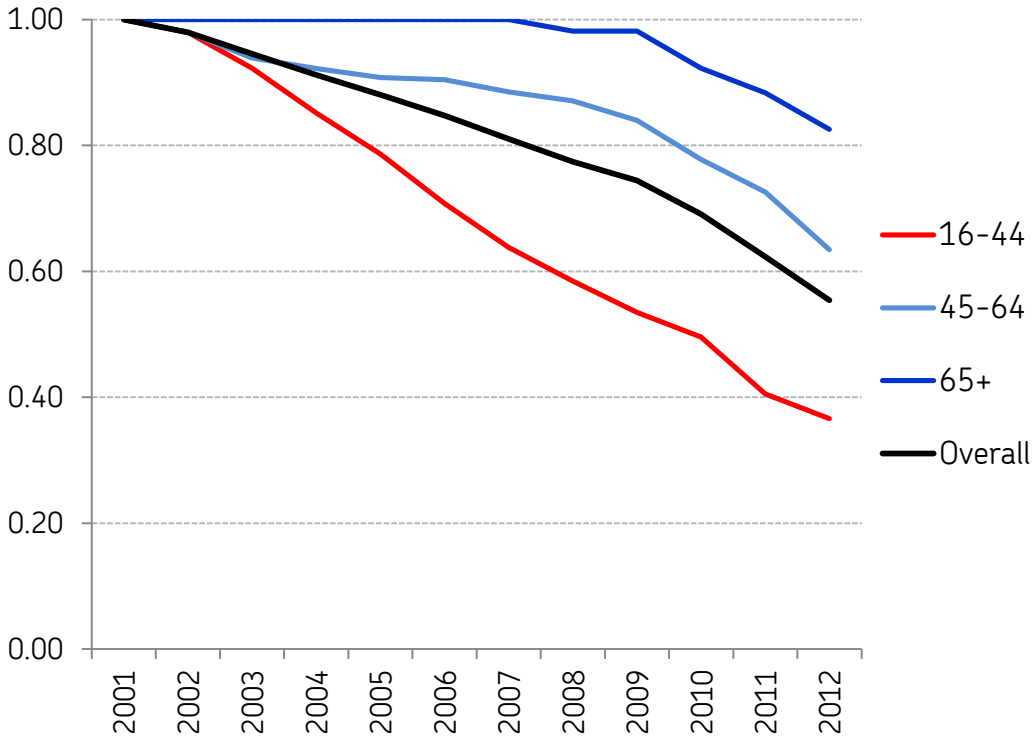


Source: Royal Mail

E_t equals (1 - proportionate loss to e-substitution) relative to a base year, where E_t = 1 implies no e-substitution relative to that base year (2001) and E_t = 0 implies complete loss of all mail.

E-Index (E_t) estimates by age-group and ability/willingness to receive e-communications

E-index estimates by age-group of recipient, 2001 to 2012 (2001=1)



Source: Royal Mail Group

Estimates of access by individuals to the Internet by age group, %*

Age group	2012 Q3	2015 Q1
16-24	98	99
25-34	97	99
35-44	95	97
45-54	90	94
55-64	80	87
65-74	58	71
75+	26	33
All	**82**	**86**

*Percentage of individuals using the Internet by any device in preceding 3 months,
Source: Office for National Statistics

Summary and conclusions

- Econometric estimates suggest letter volumes are determined by four key factors: economic activity, the number of households, prices and E-substitution
- Our E-Index estimates suggest Business letters are approximately half of what they would otherwise have been in the absence of e-substitution and the rate of decline has increased since the Great Recession
- Indicative E-indices by letter content, senders and age of recipient suggest:
  - Physical bill/invoice communications declined to a greater extent than those for ad hoc business letters and financial correspondence
  - E-sub. in retail & utilities sectors is more advanced than government & insurance
  - There is a pronounced difference in the extent of e-substitution by age of recipient
- Our analysis suggests that over the short to medium (say, 3 to 5 years) the rate of letter volume declines in the UK will primarily depend on:
  - Older individuals ability and willingness to receive e-communications
  - The governments digital communications strategy
  - The extent to which senders and recipients of ad hoc and non-standard transactions (especially high value added business activities relating to insurance, legal and financial transactions) are able and willing to replace mail by e-communications
- An interesting question that could be further explored is the linkage between e-substitution by content type, sender group and age-of recipient.