

Institution: University of Essex
Unit of Assessment: 19 – Business and Management Studies
Title of case study: Helping Royal Mail Business Strategy
<p>1. Summary of the impact</p> <p>Professor John Nankervis' Inland Letter Traffic Models (ILTMs) forecast demand for Royal Mail's letter business and provide estimates of the effects on letter traffic of economic activity, the cost of letters and competition in the communications market. These estimates directly influence Royal Mail's strategic business plans and pricing policies, have fed into applications to the regulators for stamp price changes and formed part of the evidence base for The Postal Services Bill, passed into Law in June 2011, which sets out the future of UK postal services provision.</p>
<p>2. Underpinning research</p> <p>Nankervis worked in theoretical and applied research in time series econometric models. Undertaken at Essex from 2003 to 2012, his theoretical work investigated the properties of estimators and test statistics in econometric time series models (Nankervis and Savin, 2010), and he applied this research in a number of contexts, including currency exchange rates (Chortareas et al, 2011) and UK postal traffic (Veruete-McKay et al, 2011). Nankervis' work in UK letter traffic was undertaken in collaboration with economists at Royal Mail, with whom he used his theoretical research to build time series econometric models of demand for UK letter traffic (see for instance Marzena et al, 2013). Thus Nankervis' theoretical and applied research in time series econometrics resulted in academic publications and industry reports, the latter informing Royal Mail decisions and activities.</p> <p>In order to take account of the time series properties of the variables considered, Nankervis developed vector error correction models for letter traffic volume. These Inland Letter Traffic Models (ILTMs) obtained express letter traffic demand as a function of a set of explanatory variables: the level of economic activity, prices, the quality of service and the level of competition. Given forecasts for these explanatory variables, the ILTMs are used to obtain forecasts for letter traffic volumes. Total traffic volumes as well as volumes of first class, second class, and 'other' letter traffic (pre-sorted and direct mail) are obtained.</p> <p>A novel feature of the models is that the measure of economic activity used is given by weighting the main sectoral constituents of GDP by mail use within each sector; financial services are more heavily weighted than manufacturing, for example. The ILTMs provide estimates of long-run elasticities of letter traffic with respect to the explanatory variables. The models also provide unit long-run estimates of elasticity of per capita total letter growth with respect to weighted GDP.</p> <p>Nankervis used the ILTMs in a number of applications. He found that the elasticity of per capita total letter growth with respect to weight GDP has remained constant, even though there has been a declining trend in total traffic due to the increasing effect of e-communications and competition. The estimated first and second class price elasticities are small but have increased in recent years. The estimated price elasticity for 'other' mail is approximately equal to one. Thus the ILTMs find that pre-sorted and direct mail volumes are more sensitive to price changes than first and second class letter volumes. The ILTMs have also been applied to forecast the effect of growing electronic communication. Alternative methods of communication - such as email - have been growing since 2002. The ILTMs have captured the effect of these changes through the introduction of gradually increasing trend effects.</p> <p>The models and corresponding results were first presented in 1995 to the '3rd Postal Services and Regulation conference' – a leading international and interdisciplinary conference at the forefront of strategic and regulatory debates in the global postal industry. Further presentations on aspects of later models have also been subsequently disseminated at this conference (in 2009 and 2012) and</p>

the academic peer-reviewed proceedings from each conference published in refereed texts as detailed below.

3. References to the research

- Nankervis, J.C., and N.E. Savin (2010) Testing for serial correlation: Generalized Andrews-Ploberger tests, *Journal of Economic and Business Statistics*, 28 (2), 246-255. DOI: 10.1198/jbes.2009.08115
- Chortareas, G., Y. Jiang, and J.C. Nankervis (2011) The Random-Walk behavior of the Euro exchange rate, *Finance Research Letters*, 8 (3), 158-162. DOI: 10.1016/j.frl.2010.10.003
- Veruete-McKay, L., S. Soteri, J.C. Nankervis, and F. Rodriguez (2011) Letter traffic demand in the UK: An analysis by product and envelope content type, *Review of Network Economics*, 10 (3). DOI: 10.2202/1446-9022.1233
- Marzena J., J.C. Nankervis, J. Pope, S. Soteri, and L. Veruete-McKay (2013) Letter traffic demand in the UK: Some new evidence and review of econometric analysis over the past decade, in Crew and Kleindorfer (eds.) *Reforming the Postal Sector in the Face of Electronic Competition*, Cheltenham: Edward Elgar. ISBN: 9780857935809

4. Details of the impact

Nankervis' theoretical research in time series econometrics informed his applied collaborative research with Royal Mail economists. Nankervis helped Royal Mail analyse the effects of factors such as stamp prices on letter traffic demand and consulted with them to produce letter traffic demand forecasts. These forecasts regularly provide data to Royal Mail senior executives and inform Royal Mail decision making and business strategy. As explained by the CEO of Royal Mail:

The ILTM is used in three important ways:

- First, as a business forecast model to inform business and strategic plan central case projections accounting for over £5bn of Royal Mail revenue
- Second, as a scenario analysis tool to inform business risks surrounding our central AIM projections (including Monte Carlo simulation analysis)
- Third, the ILTM estimated price elasticities are key inputs into the Royal Mail strategic pricing and competitive entry model, which in turn is used to inform pricing decisions and competitive entry into the letters market.

CEO, Royal Mail [corroborating source 1]

Royal Mail's CEO also notes that 'business reports and external publications, written by John Nankervis and our internal economists, have been submitted to our regulator (previously Postcomm and now Ofcom), Shareholder (the UK Government), Pension Trustees and also the European Commission'. These submissions have informed two major changes to the regulation and administration of the UK's postal service: the UK Postal Services Act 2011, and the 2011 increase in stamp prices.

Postal Services Act 2011

Nankervis' collaborative research with the Royal Mail informed the UK Postal Services Act of 2011. Results from the ILTMs, such as demand forecasts and estimated price elasticities, were integral to Royal Mail's submissions to an independent review of UK Postal Services (the Hooper Review) undertaken in 2008 and updated in 2010. In the words of the Royal Mail's Head of Economic Forecasting, the Royal Mail submissions 'heavily influenced the outcome of the [Hooper] review' [corroborating source 2]. The Hooper Review provided recommendations for the reform of the postal service based on the data provided by Royal Mail, that data a result of Nankervis' work with Royal Mail economists.

The Hooper Review's recommendations, based on this data, were accepted by the UK Government, as stated in an Impact Assessment for the Postal Services Bill undertaken by the

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Department for Business Innovation and Skills: 'The Government intends to proceed with the Hooper Review's main recommendations [including] to bring about modernisation of Royal Mail through introducing private sector capital' [corroborating source 3, p.2]. The bill was passed into law in June 2011; the Postal Services Act sets out the future of postal services provision in the UK, including the privatisation of 90% of Royal Mail's business.

Stamp price increases

In a particularly significant consultation with Postcomm, the models were used by Royal Mail economists in an ultimately successful request for permission to increase stamp prices. In consultation with Nankervis, ILTMs were used to estimate the effect of stamp price changes on demand. The results of this application of the model were integral to the case the Royal Mail made for the increase of stamp prices in 2010-11. In 2010 Postcomm began a statutory consultation on the regulation of Royal Mail entitled 'Laying the foundations for a sustainable postal service'. Royal Mail's response to this consultation included a request for deregulation on stamp prices, a request supported by ILTM data, in particular the estimated low first and second class price elasticities [source 4].

In 2011 Postcomm granted Royal Mail's request and deregulated their control of stamp prices, granting permission to some increases in price [source 5]. This decision was informed by the Royal Mail response to the Postcomm consultation, which was in turn informed by Nankervis' research into the effect of stamp prices on letter traffic demand. As a result of Postcomm's decision Royal Mail increased stamp prices in 2012.

The role of Nankervis and his research in this process is explained below by Royal Mail's Head of Economic Forecasting:

The output of John's work on the ILTM and publications helped us to convince Postcomm, and subsequently Ofcom, that the decline in mail volumes was mainly due to structural factors related to technological changes and not primarily due to the level of letter prices. This debate (high price elasticity versus structural decline) was a highly contentious business issue within Royal Mail which John's last piece of work for us on the ILTM (2011) helped to provide an answer – John's work in this area in combination with market research and other academic work we undertook with the University of Toulouse was very important in helping Royal Mail to reach evidence based business decisions on pricing.

Head of Economic Forecasting, Royal Mail

5. Sources to corroborate the impact [All sources saved on file with HEI, available on request]

1. CEO, Royal Mail
2. Head of Economic Forecasting, Royal Mail
3. Post Services Bill 2010 Impact Assessment, Department for Business Innovation and Skills: <http://www.parliament.uk/documents/impact-assessments/IA10-129.pdf>
4. Postcomm Consultation, Royal Mail's Reponse, August 2010: http://www.royalmailgroup.com/sites/default/files/Postcomm%20Consultation_Response_2010.pdf
5. 'Laying the Foundations for a Sustainable Postal Service, Licence Modification Decision', Postcomm, March 2011: <http://stakeholders.ofcom.org.uk/binaries/post/1880.pdf>