

# David C. Broadstock | Economist

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Date of birth: 19th July, 1982.

## Education

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### University of Surrey

*PhD, Economics*

UK

2004–2008

My thesis work, sponsored by the Economic and Social Research Council (ESRC) under a CASE award, explored activity-based demand for transport across the UK using a range of applied econometric techniques.

### University of Portsmouth

*MSc, Business Economics*

UK

2003–2005

(18 Month program)

### University of Portsmouth

*BA(Hons.), Business Economics*

UK

2000–2003

## Professional activities and services

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**The Energy Journal:** (2017–Present) *Editor.*

**The Energy Journal:** (2016–2017) *Editorial board member.*

**British Journal of Management:** (2016–present) *Editorial board member.*

**Referee work:** Applied Economics, Computational Economics, Economics of Energy and Environmental Policy, Elsevier books in Economics and Statistics, Energies, Energy Economics, Energy Efficiency, Energy Policy, Finance Research Letters, International Journal of Sustainable Transportation, International Review of Economics and Finance, International Review of Financial Analysis, Journal of Cleaner Production, Journal of the Operational Research Society, Journal of Regional Science, The Energy Journal, Transport Policy, Transportation Research Part A: Policy and Practice.

## Publications

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2017.....

[33] D. C. Broadstock, Alan Collins, Lester C. Hunt, and Konstantinos Vergos, (2017) “Voluntary disclosure, greenhouse gas emissions and business performance: Assessing the first decade of reporting.” *The British Accounting Review*.

2016.....

[32] D. C. Broadstock, and Alan Collins, (2016) “Satisfaction with the Political Domain of Local Government in a Contemporary British City.” *Tijdschrift voor economische en sociale geografie*.

[31] D. C. Broadstock, and Alan Collins, (2016) “The demand for ‘active travel’: An unobserved components approach.” *Journal of Transport & Health*, 3(3), 326-335.

[30] D. C. Broadstock, **Jiajia Li** & Dayong Zhang, (2016) "Efficiency Snakes and Energy Ladders: A (meta-)frontier demand analysis of electricity consumption efficiency in Chinese households.", *Energy Policy*.

[28] **Kostas Tsekouras**, Nikos Chatzistamoulou, Kostas Kounetas & D. C. Broadstock, (2016) "Spillovers, Path Dependence and the Productive Performance of European Transportation sectors in the presence of Technology Heterogeneity", *Technological Forecasting and Social Change*.

[27] **D. C. Broadstock**, Ying Fan, Qiang Ji & Dayong Zhang (2016) "Shocks and stocks: A bottom-up assessment of the relationship between oil prices, gasoline prices and the returns of Chinese firms", *The Energy Journal*.

[26] **Jin Zhang**, & D. C. Broadstock (2016) "The relationship between energy consumption and economic growth for China in a time-varying framework", *The Energy Journal*.

[25] Dayong Zhang, & **D. C. Broadstock** (2016) "Club Convergence in the Energy Intensity of China", *The Energy Journal*.

#### 2015.....

[24] Binbin Peng, **Huibin Du**, Shoufeng Ma, Ying Fan, & **D. C. Broadstock** (2015) "Urban passenger transport energy saving and emission reduction potential: A case study for Tianjin, China", *Energy Conversion and Management*.

[23] Hongyang Zou, **Huibin Du**, D. C. Broadstock, Junpeng Guo, Yuqin Gong. (2015). "China's future energy mix and emissions reduction potential: a scenario analysis incorporating technological learning curves." *Journal of Cleaner Production*.

[22] **Lichao Wu**, & D. C. Broadstock (2015). "Does economic, financial and institutional development matter for renewable energy consumption? Evidence from emerging economies." *International Journal of Economic Policy in Emerging Economies* 8(1) (2015): 20-39.

[21] D. C. Broadstock & **Filis. G.** (2015) "Energy prices, sectoral indices and regulation" Book Chapter (in 'Energy technology and valuation issues') Ed. Andre Dorsman, Springer.

[20] D. C. Broadstock & **E. Papathanasopoulou**, (2015) "Gasoline demand in Greece: the importance of shifts in the underlying energy demand trend", *International Journal of Sustainable Transportation*, 9(4), 310–319.

#### 2014.....

[19] D. C. Broadstock & **Filis. G.** (2014) "Oil price and stock market returns: New evidence from the United States and China", *Journal of International Financial Markets, Institutions & Money*, 33, 417–433.

[18] **D. Zhang** & D. C. Broadstock, (2014). "Impact of International Oil Price Shocks on Consumption Expenditures in ASEAN and East Asia", Working Papers DP-2014-24, Economic Research

Institute for ASEAN and East Asia (ERIA).

[17] **D. C. Broadstock**, (2014) "Oil and China" (2014) Book Chapter (in 'Energy Security and Sustainable Economic Growth in China') Eds. Yao. S., and Herrerias. M. J., Palgrave Macmillan. ISBN: 9781137372048.

[16] Dayong Zhang, **D. C. Broadstock** & H. Cao, (2014) "International oil shocks and household consumption in China", *Energy Policy*, 75, 146–156.

[15] **D. C. Broadstock**, R. Wang & D. Zhang, (2014) "Direct and indirect oil shocks and their impacts upon energy related stocks.", *Economic Systems*, 38, 451–467.

[14] **D. C. Broadstock**, A. Collins & L. C. Hunt, (2014) "Determining Trip Attraction Rates for UK Office Developments with Limited Observations and Missing Data", *Transportation Planning and Technology*, 37(3), 1–17.

2013.....

[13] **D. C. Broadstock** & L. C. Hunt, (2013) "Tying up Loose Ends: A Note on the Impact of Omitting MA Residuals from Panel Energy Demand Models based on the Koyck Lag Transformation", *The Empirical Economics Letters*, 12(10), 1085–1092.

[12] Y. Shu, **D. C. Broadstock**, and B. Xu, (2013) "The Heterogeneous Impact of Macroeconomic Information on Firms' Earnings Forecasts", *The British Accounting Review*, 45(4), 311-325.

[11] **D. C. Broadstock** & X. Chen, "A possible role for discriminatory fuel duty in reducing the emissions from road transport: some UK evidence", (2013), *Applied Economics Letters*, 20(6), 540-544.

2011.....

[10] **D. C. Broadstock**, H. Cao & D. Zhang, (2011) "Oil Shocks and their Impact on Energy Related Stocks in China", *Energy Economics*, 34(6), 1888-1895.

[9] **D. C. Broadstock**, A. Collins & L. C. Hunt, (2011) "Transportation Oil Demand, Consumer Preferences and Asymmetric Prices", *Journal of Economic Studies*, 38(5), 528-536.

[8] **D. C. Broadstock**, Y. Shu, and B. Xu, (2011) "Do Macroeconomic Conditions Affect Firm-level Earnings Forecasts?", *International Journal of Trade, Economics and Finance*, 2(5), 450-454.

2010.....

[7] **D. C. Broadstock**, A. Collins & L. C. Hunt, (2010) "Modelling car trip generations for UK residential developments using data from TRICS", *Transportation Planning and Technology*, 33(8), 671-678.

[6] O. Adeyemi, D. C. Broadstock, M. Chitnis, G. Judge and **L. C. Hunt**, (2010) "Asymmetric price responses and the underlying energy demand trend: Are they substitutes or complements?"

Evidence from modelling OECD aggregate energy demand”, *Energy Economics*, 32, 1157-1164.

[5] **D. C. Broadstock** & A. Collins, (2010) “Measuring unobserved prices using the structural time series model: The case of cycling”, *Transportation Research Part A: Policy and Practice*, 44(4), 195-200.

[4] **D. C. Broadstock** & L. C. Hunt, (2010) “Quantifying the impact of exogenous non-economic factors on UK transport oil demand”, *Energy Policy*, 30(3), 1559-1565.

[3] **D. C. Broadstock**, (2010) “Non-linear technological progress and the substitutability of energy for capital: An application using the Translog cost function”, (2010), *Economics Bulletin*, 30(1), 84-93.

2007.....

[2] **D. C. Broadstock**, L. C. Hunt & S. Sorrell (2007) “Technical report 3: An assessment of evidence for the elasticity of substitution between energy and capital”, United Kingdom Energy Research Centre (UK-ERC).

[1] C. Black, **D. C. Broadstock**, A. Collins & L. C. Hunt, (2007) “The derived demand for traffic at food superstores in the UK: A semi-parametric regression approach”, *International Journal of Transport Economics*, XXXIV(3), 403-427.

## Papers under review / revision

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### **Time-varying probabilities of the importance of oil shocks**

*With George Filis,*

In this paper we examine the probability that oil price shocks affect the excess returns of US listed firms. The probabilities are obtained from a time-varying multi-factor asset pricing framework, including oil shocks among several possible risk factors. The estimated probabilities are non-trivial yet low—with effects ‘probable’ for around 12.5% of the time only—leaving the role of oil shocks in explaining stock market movements rather questionable, contrary to what prior literature has claimed. We reconcile differences between our findings and those reported in previous literature on the basis of the fully dynamic nature of our adopted methodology. As far as we know our dataset, which comprises 4,489 stocks with 12,905,220 observations between 1998–2016, is the most comprehensive used for this purpose.

**The Energy Journal**

*Under review*

### **Initial submarket positioning and firm survival**

*With Zhao Rong and Yuanyuan Peng,*

This paper documents an additional determinant of firm survival. By examining firms' duration of survival in the British automobile industry between 1895 and 1970, we find that a firm's initial submarket positioning (defined by the quality level of its first-launched model) influenced its subsequent survival. Additionally, we find that the initial positioning also helped firms to survive a major shakeout, and further argue that path-dependence and innovation were two possible channels through which the benefits of initial positioning were felt.

**Small Business Economics**

*Revision requested*

### **The Market for Labelled Green Bonds**

*With Louis Cheng,*

**Energy Economics**

*Invited submission, SI on Green Finance*

The first labelled green bond was issued by the European Infrastructure Bank in 2007. By 2017 the Green Bond market has witnessed prodigious growth, attracting hundreds of billions of dollars of investment from all corners of the globe. In this paper we summarize the emergence of this novel financial instrument, which has really established itself since around 2014 as a credible market for global investors. Further, econometric methods are used to quantize the trends, both past and future, in this market when compared against the traditional or black bond market. The results suggest that current trends will continue, but that key environmental factors such as political and financial uncertainty might influence the future vitality of the green bonds market.

### **Time-varying parameter energy demand functions**

**Energy Economics**

*With Aynur Alptekin, Xiaoqi Chen and Dong Wang,*

*Under review*

Time-varying parameters and elasticities are an appealing extension to constant parameter energy demand functions. The state-space framework is the most common modeling approach used for explicitly modeling time-varying effects. Rolling-regressions are another approach which have been used to approximate time-varying effects (elasticities of demand for natural gas in Istanbul) as in Altinay and Yalta (2016), and which have been argued to offer robustness in the presence of non-stationary variables, missing variables, complex error structures etc., see Yalta (2016). Through a combination of replication and Monte-Carlo simulation work, we challenge the wisdom of using rolling-regressions for the purpose of obtaining accurate time-varying parameters. Specifically, rolling regressions fail to obtain accurate coefficient estimates (and hence economic implications) in around 90% of our simulations. Conversely state-space based approaches are accurate 70% of the time in small samples, and 90% of the time in large samples.

## **Work in progress**

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### **Doing well by doing good: An eco-efficiency perspective**

**Journal of Corp. Fin.**

*With Roman Matousek, Shunsuke Managi and Nickolaos Tzeremes,*

*To submit in 2017*

We combine advanced efficiency modeling techniques, combined with the underlying concepts tackled within the literature on eco-efficiency, to provide a novel perspective on the literature correlating environmental and social governance reporting with firm value and performance. We provide evidence in support of diminishing marginal returns to ESG report, and further consider whether such effects may be connected with the agency problems faced by firms, culminating in a potential trade-off between managers personal objectives and the maximization of shareholders wealth.

### **The wrong way to bootstrap the nonparametric meta-frontier**

**To be decided**

*With Kostas Kounetas and Kostas Tsekouras,*

*To submit in 2018*

We first show that the results contained in some existing applications of nonparametric metafrontier modeling, fail to satisfy important economic conditions. We then illustrate how such failures arise, and clarify an appropriate estimation algorithm that strictly eliminates these failures. A Monte-Carlo exercise is used to demonstrate that our 'corrected' approach results in some important modeling performance gains.

### **Implicit social ties and firm value**

**Journal of Accounting & Economics**

*With Xiaoqi CHEN and Agnes CHENG,*

*To submit in 2017*

This work represents a foray into the empirical research on peer and social network effects, and the positive benefits they can imbue to individuals, and in our case the firms those individuals work in. We depart from existing work in this area by specifically focusing on the importance of implicit social ties and networks—essentially the second-order network—of the senior management team as a whole. We find a significant influence that is strongest for state-owned enterprises, and robust to efforts to control for endogeneity.

### **Sentimental stocks in China**

**Journal of Financial and Quantitative Analysis**

*With Xiaoqi CHEN,*

*To submit in 2017*

We integrate big-data on the sentiment contained on online blogs relating to 2,500 separate listed companies in conjunction with 7.5 million observations on daily stock returns to test the relevance of investor sentiment theory for Chinese stocks. To do so we adopt an advanced time-series econometric framework, modified to elicit considerable computational efficiency—using supporting evidence from a Monte-Carlo exercise to evaluate the power properties after applying our modifications.

## **The influence of political uncertainty to US stock returns**

**To be decided**

*With Stavros Degiannakis, George Filis,*

*To submit in 2018*

Using daily stock price data from 1985-2017 for all US listed firms (live and dead), we provide a comprehensive empirical evaluation of the timing and nature of influence of economic policy uncertainty to stock returns. The objective is to identify those stocks which are most sensitive to policy uncertainty, and then to look for commonalities across those firms e.g. in terms of corporate structure, industry, operating performance metrics, risk of closure (hence the inclusion of the dead firms) etc.

## **Conferences and workshops hosted**

<b>Green Bonds</b> : International workshop - by invitation	<i>Hong Kong</i>
<b>Green Finance Symposium</b> : See <a href="http://www.polyu.edu.hk/af/cesef/events/GB/">http://www.polyu.edu.hk/af/cesef/events/GB/</a>	<i>Hong Kong</i>
<b>RUSE: Regional, Urban and Spatial Economics (2016)</b> : International conference	<i>Chengdu</i>
<b>2014 TIERS workshop</b> : Domestic meeting - by invitation	<i>Chengdu</i>
<b>2015 TIERS workshop</b> : Domestic meeting - by invitation	<i>Chengdu</i>
<b>2016 TIERS workshop</b> : International meeting - by invitation	<i>Chengdu</i>

## **Work experience**

**Current**.....

### **Hong Kong Polytechnic University**

**Hong Kong**

*Assistant Professor*

*2016–Present*

Duties include:

- Deputy Director, Center for Economic Sustainability and Entrepreneurial Finance
- Deputy Program Director, Masters of Finance in Financial Economics of Energy and the Environment–MoF(EEE)
- PolyU Green Deck task force member
- Department Research Committee member
- PhD Supervisor (Xiaoqi Chen)

**Previous**.....

### **Southwestern University of Finance and Economics**

**Chengdu, China**

*Associate Professor*

*2010–2016*

I held position as Associate Professor in Economics within the Research Institute of Economics and Management (RIEM). I developed the TIERS energy research cluster, and an undergraduate program in Energy Economics.

### **University of Patras**

**Patras, Greece**

*International Expert-THALES*

*2012–2015*

In this project I worked directly with colleagues at the University of Patras in Greece to explore concepts of efficiency in the presence of structural heterogeneity of decision making units/agents. The project work itself was completed some time ago, however collaborative research with the team is ongoing.

### **Division of Economics and Finance, University of Portsmouth**

**Portsmouth, UK**

*Visiting Associate Professor*

*2012*

During this short sabbatical I visited long-term co-authors to complete several existing research projects, and foster new ideas.

### **Department of Economics, University of Surrey**

**Guildford, UK**

*Visiting Lecturer*

*2010*

I provided short term teaching support to the department on the undergraduate economics program, and supervised MSc supervision for three economics students - two of which were awarded distinctions for their work.

**Halcrow/Crossrail Project Delivery Partner****London, UK***Lead Risk Analyst (on secondment)*

2009–2010

In this role I was the senior risk analyst for the Crossrail project delivery partner. I was directly responsible for implementing the risk-valuation process and maintaining the investment grade risk valuation model relating to approximately GBP 10 billion worth of investment.

**Halcrow****London, UK***Economist/Consultant*

2008–2010

I was a consultant within the Economics and Business Solutions team (EBS) and provided a range of support on different projects. I list some of the sample projects at the end of this CV, though much of the work was on business case development, with a particular emphasis on industrial park development, and large transportation infrastructure related projects.

**JMP Consulting****Edinburgh, UK***Transport Planner*

2007–2008

My first job after completing my PhD (I started after submitting the final version, but prior to graduation), JMP were co-sponsors of my thesis work. Through my work at JMP I was responsible for general transport planning issues and provided support on a wide range of projects. I was seconded to the Scottish transport authority for around 50% in which my duties were to evaluate planning applications on the basis of the transport network implications of the proposed modifications. (i.e. to accept or reject planning applications on the basis of traffic volume/safety implications)

## Teaching experience & PhD supervision

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### Undergraduate.....

- Global Economic Environment,
- Introductory Microeconomics,
- Introductory Econometrics / Analysis of Economic Data / Financial Econometrics
- Energy Economics
- Organizational Behaviour (Management course)

### Graduate.....

- Energy Economics / The Economics of Oil and Gas / Transport and Energy Econometrics / World Energy Markets
- Study Skills (elements of this course have also been delivered to undergraduate students)
- Applied State-space modeling in Economics (3 day course, Shandong University)
- Organizational Behaviour (International MBA course, Shandong University)

### PhD Students.....

**Implicit social ties and firm performance in China****CHEN Xiaoqi***Hong Kong Polytechnic University*

2017–Present

Xiaoqi's thesis work remains in a fairly early stage of development, though its focus will be on the role of implicit social ties and social network effects to firm performance.

**Essays on Chinese energy and environmental economics****LI Jiajia***Southwestern University of Finance and Economics*

Graduated 2017

Jiajia's thesis work explored topics of energy and environmental economics in China. I was Jiajia's principle adviser until mid 2016 after which I moved to PolyU, and Prof. Dayong ZHANG formally took over the supervision duties.

## Computer skills

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**Word processing:** Word, Latex**3D Animation/design:** Blender

**Presentation tools:** Powerpoint, Prezi, Latex (Beamer)  
**Graphic design:** GIMP, Inkscape (especially for scalable vector graphics)  
**Statistical:** R (my favored platform), Stata, Eviews, Matlab  
**Video editing:** PowerDirector (including 2d and 360 degree video editing)  
**Web design:** HTML, Perl, Brackets (general code-writing platform), FileZilla  
**Other:** Microsoft office, C++, Linux operating system

## 'Non-conventional' data analytics skills

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**Big data analytics:** Big-data is a modern buzz-word, and everybody wants to do it, but few comprehend fully what big-data is. I give a two-way typology. 'First order big-data' is where the actual data used are of a massively large dimension. To imagine what I mean by this, I simply consider a definition as being a regular PC and standard software should struggle to open up the data, let alone conduct meaningful operations and analysis with it. I for example in some of my work am using tick and quote data on energy prices, with a dataset that contains close to a billion observations in cases. My co-authors had this data for more than a year, but were unable to even open it without my aid. 'Second order big-data' is how I refer to summaries of big-data provided in a readily usable format. The most obvious case at hand is Google-trends, through which Google makes available an index of search volumes (based on their own first-order big-data) in time-series format, which can then be correlated against various other time series data.

**Textual analysis:** I will provide two examples of tasks of work I am currently doing in this area, that should feature in working papers over the next 12 months. (1) time-series sentiment analysis of EIA and OPEC oil market reports. Using a dictionary of words connected to positive and negative sentiment, I construct and contrast monthly time series of the sentiment contained in EIA and OPEC oil market reports, with a view to evaluating the contemporary role of OPEC as a price-maker. (2) Content analysis of 17,000 news articles on natural gas markets. Motivated by events on the Crimean Peninsula, the objective is to see how/whether news connecting to/emerging from Russia, and pertaining directly to natural gas markets, sent shock-waves across European natural gas markets/prices. For this purpose I undertake a detailed textual analysis on the contents of more than 17,000 news articles drawn from the Factiva database, constructing a rich time-series that is subsequently fed into a stochastic model of price determination.

**Web-scraping:** A foundation skill in compiling unique/novel data for large scale analytics is web-scraping. Web-scraping is the process by which a computer is programmed to visit a website, download the information contained on a web-page of interest, and store it in a usable format on your own PC. I use web-scraping methods to provide real-time updates on my own Green Bond database, based on the data contained at <https://www.climatebonds.net/cbi/pub/data/bonds>, from which I generate up-to-date forecasts of future bond market development. In another example I am working with local companies to construct datasets on charitable organizations in Hong Kong, and help develop performance evaluation metrics based on their stated goals and objectives (i.e. a mix of web-scraping and textual analysis).

**Algorithm design:** In much of my current research I am using simulations and Monte-Carlo experiments to evaluate the properties of econometric estimators. Typically I establish an experiment to provide objective evaluation in response to subjective (mis-)understandings levied towards estimators. To execute such simulations requires writing coded (and auditable) algorithms that would for example: generate simulated data; estimate the model of interest; compare the estimates against known true values using a range of performance metrics; then store the results in a consistent

and memory efficient format for later interpretation.

**Parallel-computing / processing:** To facilitate working with massive datasets, and implementing complex algorithms for Monte-Carlo simulations in a timely manner, I sometimes require to distribute tasks across many cores. A typical PC has 4/8 cores that can run tasks simultaneously, however a typical stats package only uses one of these at a time, and we must somehow inform the computer to use more in some cases. To reduce the time taken in a Monte-Carlo simulation from months to weeks, or days even, I use parallel processing on a specially designed 32-core (dual-processor) PC. To this end, in addition to the soft programming skills, I also have some knowledge of the hardware side of things. I have in the past been known to build my own PC to ensure suitable architecture to speed up my analytics.

## Grants Awards and other prizes

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- **Economic and Social Research Council Case Award PhD Studentship (2005-2008 approx. £75,000)** UK Economic and Social Research Council Case Award in collaboration with JMP Consultants. PhD studentship award, covering full PhD costs and living allowances.
- **Young European Arena of Research Silver Prize (2008 approx. £3,000)** Young European Arena of Research Silver Medal, Prize value approximately 3,000 pounds (including travel costs and conference fees). Second place prize for Europe wide competition for research into transport.
- **Project 211 Grant (2010 approx. £4,500)** For research into transport demand trends in China.
- **UK Energy Research Centre (2007-2008 approx. £3,000)**
- **European Union and Greek Ministry of Education (2012 approx. £10,000)**
- **'Excellent Paper Award'** at the International Conference on Financial Management and Economics (Hong Kong, 2011) - Granting publication in the International Journal of Trade, Economics and Finance, details as per above.
- **Co-investigator, National Natural Science Foundation of China**, grant number 71573214: "Oil price dynamics and consumption patterns in China". Jan. 2016–Dec. 2019. [RMB 480,000].
- **Principal Investigator, National Natural Science Foundation of China**, grant number 71550110255: "Metaproduction functions and their application to measuring 'energy consumption efficiency' in China". Jan. 2016–Dec. 2017. [RMB 400,000].
- **Principal Investigator, Faculty of Business IDEAS grant:** "Shaping Hong Kong as a platform for green finance". Oct. 2016–Oct. 2018. [HKD 600,000].
- **Principal Investigator, PolyU/AF research fund:** "Empirical applications of models for heterogeneity relevant to energy and environmental economics". Sep. 2016–Sep. 2019. [HKD 500,000].

## Society memberships

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- Member: International Associate for Energy Economics (IAEE)
- Member: Financial Management Association (FMA)
- Member: Chinese economists society (CES)
- Member: Royal Economic Society (RES)
- Member: Hong Kong Economic Association (HKEA)
- Member: Econometric society

## Examples / summaries of previous consulting project work

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**2009 - 2010 The impact of rail on regional economies (Phase 1).** This study was undertaken in response to an inquiry by the Transport Select Committee and sought to generate evidence on the economic impact of rail on regional economies. Owing to the economic downturn and need for the government to re-affirm investment priorities, this study sought to identify how investment is as important to the regions as it is to the key urban centres such as London, Birmingham etc. Client: Advantage West Midlands, on behalf of the 9 Regional Development Agencies of England

**2009 - 2010 UK Abbey Wood: GRIP 3 financial assessment of rail-halt.** Evaluation of a GRIP 3 level business case for the rebuild of an existing rail station.

**2008 - 2010 Middle East/internal: City Management.** In this role I have supported an engagement with a major Middle East property developer regarding the management of city-wide assets and facilities. Current work has involved a through review of public/private participation options and the ways in which assets can be taken-over and/or handed-over. Client: Major property developer

**2008 - 2009 Ravenscraig: Business Case Assessment.** Involvement with the preparation of a business case for a new rail halt at a proposed mixed-use development. Client: Turner and Townsend

**2009 Scotland/internal: An econometric approach to modelling the UK road transport demand system.** With support from Halcrow's research and development funds, this work has looked into the ways in which econometric methods can be used to analyze aggregate, continuous choice problems within closed demand systems when commodity prices are unobserved. The work has sought initial peer-review at a renowned international economics conference hosted by the Scottish Economic Society, helping to raise the profile of Halcrow/EBS economists. Client: Major property develop

**2009 Brazil: High Speed Rail.** Calculation of decongestion benefits and identification of benchmark operation and maintenance costs for high speed rail developments around the world. This fed directly into a sophisticated, integrated financial and economic appraisal tool to assess the likely costs and benefits of this \$20 billion project. Client: Banco Interamericano de Desenvolvimento (BID)

**2009 UK: Consultation to Oxford Brookes on course design.** Provision of advice on the design of a new undergraduate programme on Economics, Finance and International Business Client: Oxford Brookes University Business School

**2009 UK: Rail Franchise re-bid.** In this work I provided a supporting role to the development of two core elements of a substantial franchise re-bid to the department for transport. My inputs were in the development of the Change Management and Demand strategies. Client: GoVia

**2008–2009 UK - Rugby: Pre-feasibility financial assessment of rail-halt.** Development of a high-level cost benefit analysis through a simple financial model to outline the potential costs and benefits of developing a rail-halt at the Rugby Radio Station site. Complex development related demand patterns required a thorough pre-feasibility assessment. Client: Rugby Radio Station Partnership Limited

**2008–2009 Africa: Market Study and Historical Development Case Studies.** Preparation of report to advise major oil company on various aspects surrounding the development of an industrial park in Africa. Deliverables include a review of previous industrial park developments around the world, an overview of potential industries that may locate in an industrial park and a review of cost recovery mechanisms Client: Major Oil Company

**2008 - 2009 Abu Dhabi: Asset Valuation Study.** Project management and analyst support. In light of the global credit crisis our client is looking to build a clearer picture of their credit status and capital raising potential. In so doing we are conducting a review of the asset values for their portfolio of properties to develop an up to date valuation for their balance sheets. Client: Abu Dhabi Media Company

**2008 - 2009 Abu Dhabi: Polymer based industrial zone Market study.** Project management and analyst support. In this work we are reviewing the market for polymers in Abu Dhabi and the surrounding countries in order to assess the case for new polymer conversion facilities in the region, The deliverables include a detailed review of the polymer market including relevant technical process knowledge. In addition to this in the second phase of this work we will produce an outline masterplan for the polymer based industrial zone. Client: Abu Dhabi Basic Industries Corporation

**2008 Montenegro: Market Feasibility Study.** Development of an alternative (to the existing government plan) proposal for the Velika Plaza and Ada Bojana development in Montenegro. This diverse and high profile project involved the development of a concept based a series of specific market studies to identify potential regional growth markets and/or latent demand in existing markets. An outline financial cost model was generated to determine the consequences of alternative phasing options. Client: Hydra Developments

**2008 UK: DfT Consultation Response NATA Refresh.** Expert advisor to the Highways Agency as to the impact of the proposed changes to the UK transport appraisal process (New Approach To Appraisal: Refresh) and the impacts it may have upon the effective current and future management of the strategic road network. Client: Highways Agency

**2008 Corporate Response to DfT Consultation NATA Refresh.** Coordinated the corporate response to the proposed changes to the UK transport appraisal process from the perspective of a sustainability focussed transport planning consultancy with major private and public sector operations. Client: JMP, in-house.

**2008 Minor Development Management.** During this role I spent 1-2 days per week within transport Scotland advising the Trunk Roads Network Management Directorate upon the potential impact of minor development applications on the strategic road network, making recommendations for approval, refusal or conditional approval as appropriate. Client: Scottish Executive (Term Commission)

**2007 PQQ Small Scale Rail Project Appraisal, Northern Ireland.** Full preparation of PQQ for appraisal of small scale transport. Though unsuccessful due to price, the bid ranked highest in terms of quality by a large margin. Client: Translink

**2008 Visiting Lecturer: Transport and Energy Econometrics.** Two hour guest lecture to students on an Automotive Technology and Management MSc at the University of Cranfield. This was a professional degree course aimed at large firms with delegates coming from Aston Martin and Ricardo. Client: University of Cranfield.

**2007–2008 Scottish Executive Term Commission major projects term consulting.** This role has involved a number of projects interacting with a number of clients, albeit that the principle client from the works perspective was always Transport Scotland. Within this role, aside from providing reviews of Transport Assessments and Scoping Reports, the work also involved review of documents such as: Local Plans, Structure Plans, Transport Scotland Asset Management Improvement Programme project work and Other work involved general management of information database and review of processes followed to enable efficient management of workload and maintain KPIs. Client: Scottish Executive

**2006–2007 The elasticity of substitution between capital and energy.** This work involved a review of over 100 econometric studies on the measurement of the elasticity of substitution in empirical models of production. Client: UK Energy Research Centre