Using the ABS for research purposes at NIESR

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OUTLINE

- About NIESR

- Examples of NIESR research using the ABS (and its predecessors)

- Highlighting questions and issues arising as UKDS and ABS users

- Concluding remarks

NIESR

- **Aims:**
  - To carry out research to improve understanding of the economic and social forces that affect people's lives, and the ways in which policy can bring about change.
  - To apply our expertise in both quantitative and qualitative methods and our understanding of economic and social issues to current debates and to influence policy.

- **Funders:**
  - No core funding from government; Not affiliated to any single university; Independent of all party political interests.
  - Carry out research commissioned from: government departments and agencies, research councils, the European Commission, charitable foundations.
  - Frequently work in partnership with experts in universities and other research institutes (UK and international collaborations).

- **Research themes:**
  - We currently carry out research across 18 themes, including: *productivity; labour market transitions; policy evaluation; inequality, poverty & disadvantage; migration; employment policy & practice; financial economics & regulation; macroeconomic analysis; education, training & skills; innovation, technology & digital economics*

Examples of NIESR research using the ABS

- Project 1
  - The Impact of the Financial Crisis on UK Company Performance
    - Funded by the Economic & Social Research Council
    - Undertaken in collaboration with the Bank of England

- Project 2
  - The impact of the National Minimum Wage on firm behaviour
    - Funded by the Low Pay Commission

- Project 3
  - Intangible Assets: Drivers of Growth and Location
    - Part of a larger project funded by the European Commission
    - Further analysis funded by the UK Commission for Employment and Skills

Project 1: Aims

UK productivity fell sharply during the recession of 2008-9, and has since stagnated
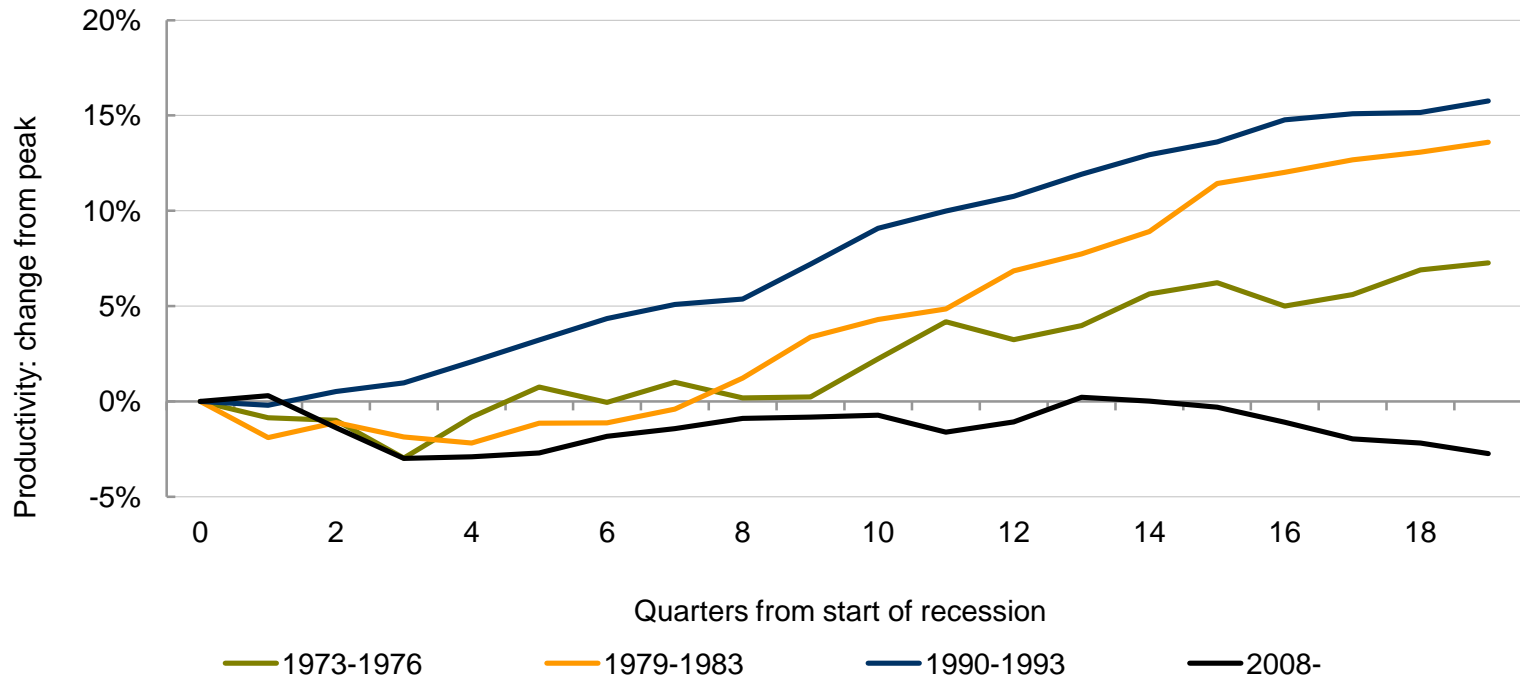
The main aim of this research is to investigate the underlying causes of recent productivity weakness in the UK, examining in particular the mechanisms by which the banking sector crisis might have affected the supply side of the UK economy, and how it has affected company performance.

Project 1: Main methods

- Decompose aggregate labour productivity growth into **within** and **between** firm effects to shed light on the extent to which the stagnation in productivity since the financial crisis is due to:
    - **resource misallocation between existing firms**, as might be expected in a banking crisis;
    - **a lack of creative destruction or cleansing effect of recession**, consistent with the idea that the banking crisis has stunted the development of young firms and provided protection, possibly exacerbated by creditor forbearance issues, for more established, yet weak companies;
    - **a widespread productivity shock**, which may or may not be directly associated with the banking crisis.

- Compare outcomes for firms who are likely to be vulnerable to credit constraints to outcomes for firms who are less likely to be vulnerable to credit constraints before and after the financial crisis.
    - Quasi-experimental approach.
    - Divide firm observations into 'treatment' and 'control' groups.
    - Provide direct estimates of the impact of credit constraints on TFP and labour productivity.

Project 1: Data

- Decomposition analysis:
  - *Data sources:* ARD and ONS GVA deflators
  - *Variables:* entry, exit, survival status (measured over 1, 3, and 4 year periods); productivity levels and growth (using GVAFC and GO); market size level and change; weights to facilitate results that are broadly representative of the population
  - *Unit of analysis and time period:* individual enterprise; analysis by broad sector and enterprise size (measured by employment); 1998-2011 and 1980/90s for manufacturing

- Quasi experiment:
  - *Data sources:* FAME and ONS GVA deflators
  - *Variables:* FAME enables us to develop measures of a company's bank dependence; FAME measures of company performance
  - *Question:* look-up tables between ONS enterprise numbers and Companies House registration numbers - do up-to-date and historical tables exist?

Project 1: Findings so far

Components of UK labour productivity change over distinct 4 year periods

Project 1: Emerging conclusions

- The reduction in UK labour productivity between 2007 and 2011 was first and foremost the result of a broad-based decline in productivity <u>within</u> companies

- The contribution to aggregate productivity growth from external restructuring did <u>not</u> fall during recession

- We can discern some possible <u>direct</u> impact of tightness of bank lending on
  - reduced contribution of entering firms to productivity change, especially for small firms

- But these results suggest that other unidentified factors – eg demand weakness, uncertainty, wider forbearance - likely to be more important in explaining weakness of productivity growth

Project 1: User experience and questions arising

- Project delays and lost research time
  - Due to initial issues with output measures in ARD 2008 and 2009
  - ARD 2010 and 2011 unavailable in SDS before August 2013

- Access to additional variables?
  - Consistent enterprise group reference (missing in nul in recent years)
  - Additional dat employment measures

- Access to local unit files?
  - RH capital stocks
  - Develop measures of TFP

Project 2: Aims

How have firms responded to the National Minimum Wage?

- The majority of evidence considers employment outcomes
  - Employee-level or regional-level analysis
  - These suggest that firms did not adjust employment by much

- Existing evidence on other outcomes is mixed, but some evidence that businesses may have
  - Raised prices
  - Absorbed cost increases in reduced profit margins
  - Increased labour productivity

- Did small companies react differently?

- Did anything change during recession?

Project 2: Main methods

- Difference-in-differences estimator applied to firm-level data
  - Following previous studies of NMW introduction impacts

    (Galindo-Rueda & Pereira, 2004; Draca, Machin & Van Reenen, 2005, 2011)

- Treatment and control groups
  - Need to measure exposure to NMW (but we do not observe individual workers' wages within firms)
  - Use firms' average labour costs per head to define T/C groups (following Draca *et al,* 2005, 2011)

- Three sets of models
  - Longitudinal models (T/C selected before treatment)
  - Repeated cross-sections annual growth models (composition of T/C changes over time)
  - Repeated cross-sections levels models (bounds around T/C outcomes)

Project 2: Data

- Validating the approach:
  - *Data sources:* WERS; ARD linked to ASHE
  - *Variables:* ARD enterprise average labour costs; ASHE employee hourly earnings
  - *Unit of analysis and time period:* individual enterprises linked to individual employees; analysis by broad (low pay) sector and enterprise size (measured by employment); 1998-2011

- Treatment analysis:
  - *Data sources:* ARD, FAME and ONS GVA deflators
  - *Variables:* labour productivity, investment rates, profitability, employment, average labour costs (levels and changes) ; exit rates and survival status
  - *Unit of analysis and time period:* individual enterprises; analysis by broad (low pay) sector and enterprise size (measured by employment); 1998-2011

Project 2: Findings so far

Distribution of SME employer average labour costs amongst low paid and other employees (*ASHE-ARD 1998-2010*)
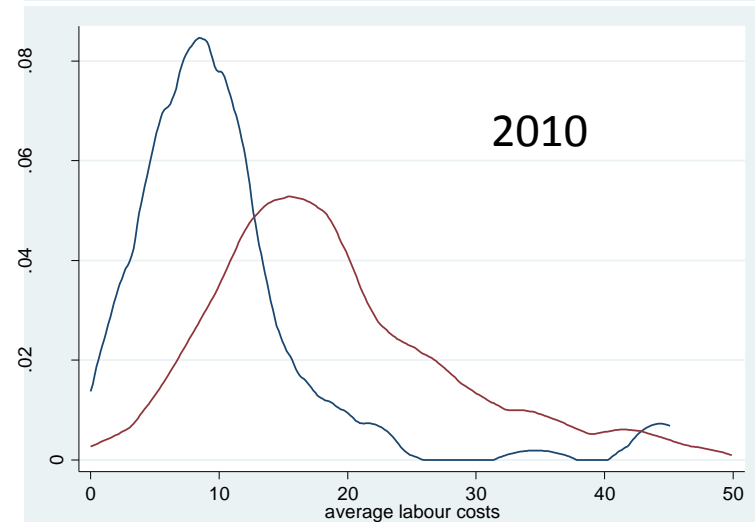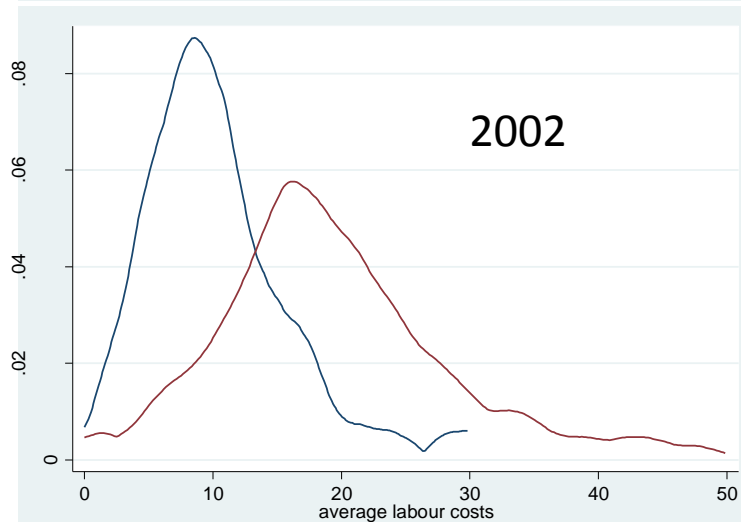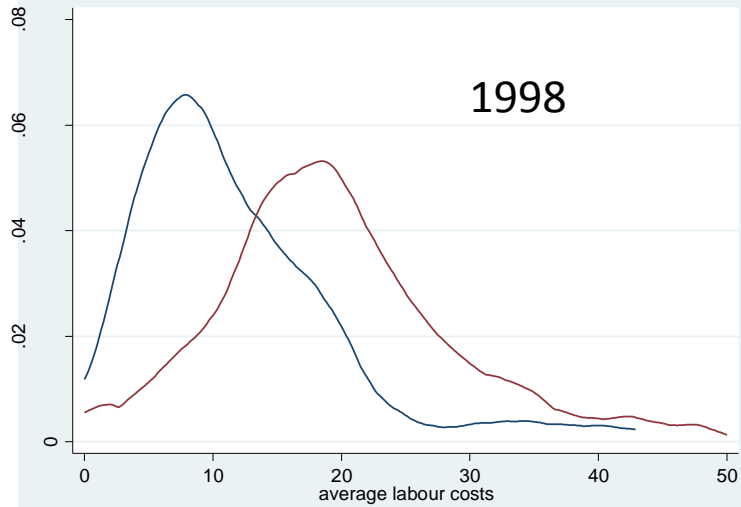
Project 2: Emerging conclusions

- The NMW increased firms' average labour costs, particularly upon introduction, and this was associated with
  - Increases in productivity and reductions in profitability
    (some differences between sectors and between small and large firms)
  - No robust evidence that companies adjusted average employment or investment rates
- No evidence to suggest that the NMW should have had a detrimental impact on businesses since recession
  - But this evidence is less robust (due to data issues we were unable to verify FAME results using the 2008-9 data in the ARD)
- Some coherence between results in ARD and FAME
- Results sensitive to T/C cut-off choice

Project 3: Aims

Intangible Assets: Drivers of Growth and Location

- Background:
  - Increasing evidence of the importance of intangibles
    - Both in measuring output and in determining output (Corrado, Hulten and Sichel 2006, 2009; Giorgio Marrano, Haskel and Wallis, 2011)
  - Highly probable, given the knowledge component of intangibles that they are not entirely appropriable and therefore that there are spillovers

- Objectives:
  - Develop a methodology for measuring firms' intangible capital that can be applied across different countries
  - Construct data on intangible capital in UK enterprises
  - Analyse empirically the contribution of these intangible assets to innovative activity and productivity growth at the enterprise level
  - Assess the impact on growth and productivity of externalities or spillovers from intangibles

Project 3: Main methods

- ## Constructing data on enterprise intangibles
  - Assess labour costs associated with intangible production
    - Evaluate occupational structure of the firm's workforce using linked employer-employee data
  - Account for related costs of intangible production
    - Evaluate cost structure of production in R&D, Computer and Other business service industries
  - Additional assumptions
    - About the share of worker effort that leads to investment
    - Capitalisation (depreciation rates, starting stocks)

- ## Analysis of performance impacts
  - Firm level regression analysis
  - Growth accounting
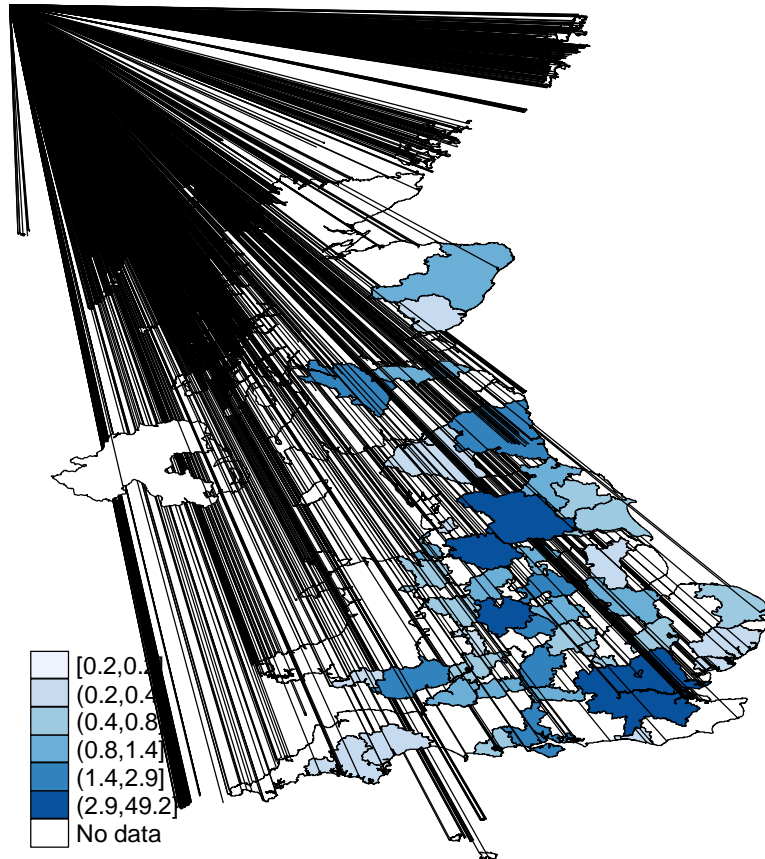 - Multi-level regression analysis

Project 3: Data

- Constructing Enterprise Intangible Asset measures:

  - *Data sources:* ARD; ASHE occupational structure linked to ARD firms by size and industry; LFS occupation and skill structure

  - *Variables:* ARD enterprise labour costs, turnover, GVA, employment, capital stocks (Richard Harris)

  - *Unit of analysis and time period:* individual enterprises; City Regions; 1998-2006 (plans to update in subsequent projects)
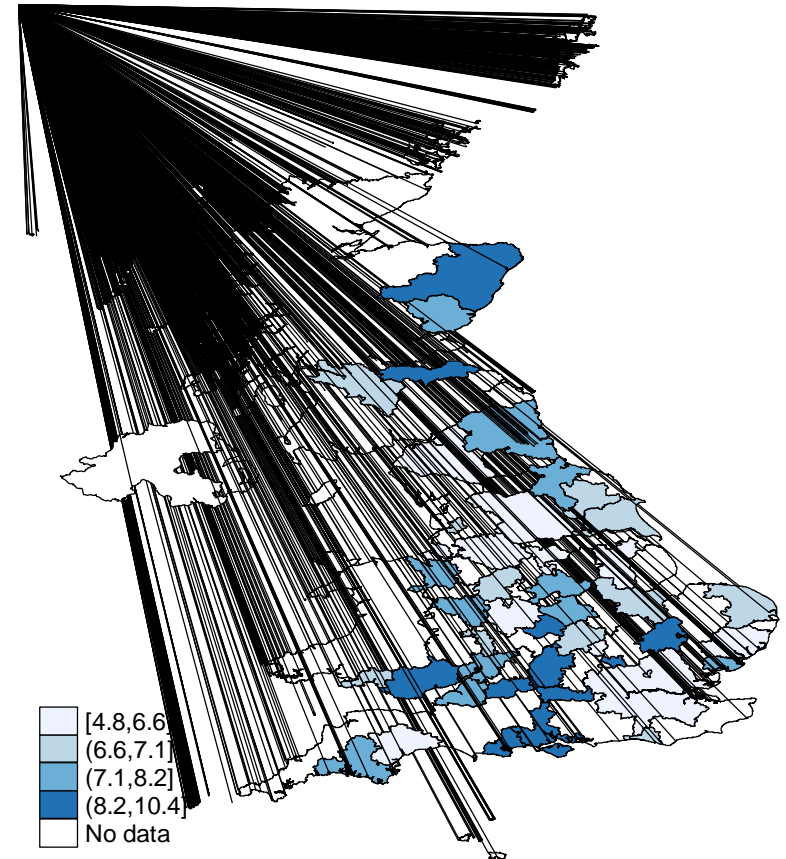
Project 3: Geographic distribution of intangibles

UK City Regions

Regional share of national intangible capital (%)

Intangible capital per hour worked (£)

[0.2,0.2]
(0.2,0.4]
(0.4,0.8]
(0.8,1.4]
(1.4,2.9]
(2.9,49.2]
No data

[4.8,6.6]
(6.6,7.1]
(7.1,8.2]
(8.2,10.4]
No data

Notes: INNODRIVE firms only (smaller firms excluded); Non-farm business sector excl. finance, construction, utilities; average 1998-2006; source ARD, ASHE, LFS.

Project 3: Some emerging conclusions

- Intangible capital is positively associated with the economic performance of firms and of UK City-Regions

- The evidence is consistent with positive spillovers from regional intangibles to firms' performance
  - So that some of the gain from intangible investment is external to the firm

- These spillovers appear to be associated with Organisational and ICT capital, rather than R&D capital

- Longer time-series are necessary to deal adequately with selection and endogeneity issues

- Disentangling human capital versus intangible capital effects is not straightforward

A few other NIESR projects that make use of the ARD

- Evaluation of the impacts of Equal Opportunities policies and practices on business performance.

    - Data: ARD records matched to WERS

- The Impact of Service Sector Innovation and Internationalisation on Growth and Productivity: Firm strategies in the knowledge-based economy.

    - Data: ARD records (including estimates of intangible assets) matched to the CIS

- Investigation of the relationship between the increasing number of migrant workers in the UK and labour productivity 1997-2007.

    - Data: ARD aggregated to region/sector level and linked to the LFS

- Analysis of performance pay and firm outcomes (productivity, profitability).

    - Data: ARD records matched to MWSS and ASHE

Concluding remarks

The ARD (ABS and its predecessors) is a valuable input to economic and social policy relevant research.

Researchers' access to the ARD via the SDS is a major improvement upon access via the VML and should facilitate wider use.

A few things that are key to our ability to undertake this research:

1. Timely access to the ARD
- to avoid project delays; to address issues of current economic and social interest

2. Access to both LU and RU files
- improves geographical analysis and allocation of industrial activity
- improves estimates of capital stocks (Richard Harris) and hence TFP

3. Quality control
- missing variables introduce limitations
- incorrect variables can be costly both in terms of time wastage and the risk of drawing erroneous conclusions

4. Documentation
- a concise user guide would be a significant help to both existing and new users of the ARD (and might encourage wider use)
- ABS Technical Report, August 2012, ed. Heather Bovill, ONS is a very welcome publication

5. SDS resource
- reliable access and fast output clearance are crucial