



Australian Government  
Department of Industry,  
Innovation and Science

Office of the  
Chief Economist



## Analysing a regional government intervention: A pragmatic way forward.

**Bilal Rafi**

Insights and Evaluation Branch  
Office of the Chief Economist

15 November 2018

# Overview

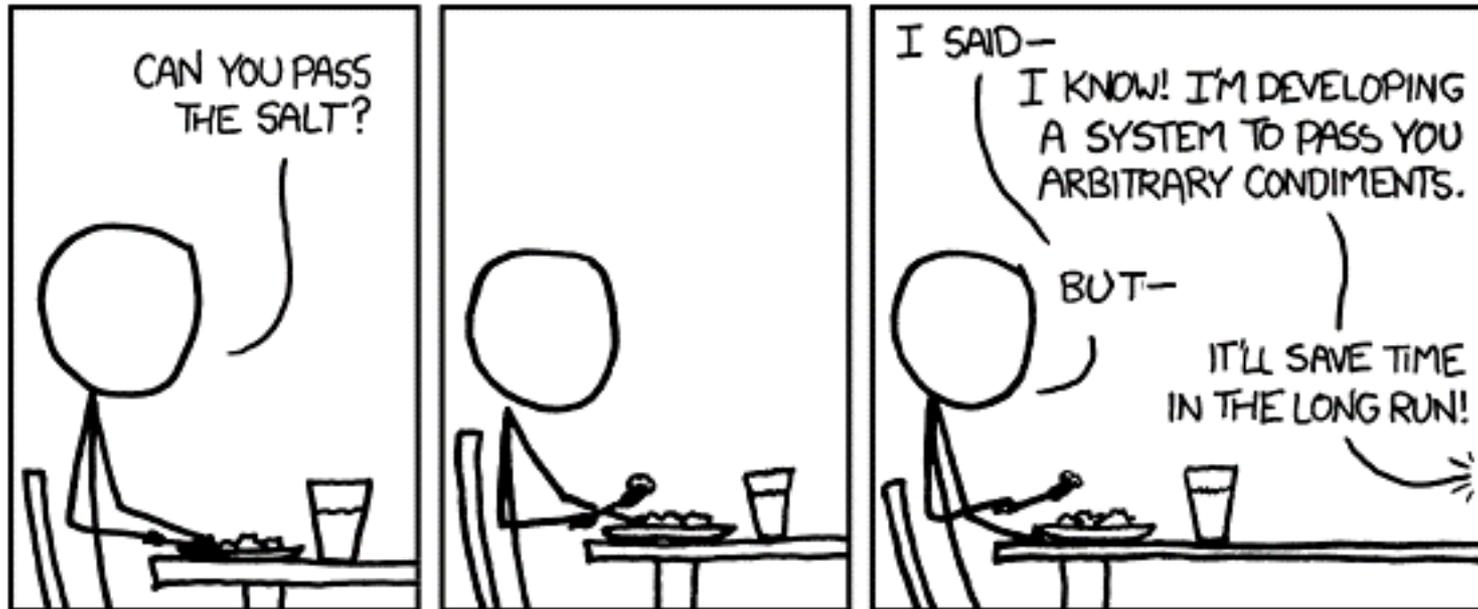
Share the OCE's experience with program impact assessments and broader evaluations

Using our recent paper on the South Australian Innovation and Investment Funds (IIFs), I will discuss:

- Our motivation for such work and the policy appetite.
- Challenges and hurdles — data, scope, methodology.
- Findings, lessons learnt, and the way forward for us.

**Pragmatism will permeate this presentation –  
bear with me on this one.**

# Pragmatism vs Perfectionism



<https://xkcd.com/>

# The Innovation and Investment Funds

## Assessing the impact of South Australian IIFs

Lack of an evidence base due to confidentiality, methodological and data complexity issues.

Considerable public policy appetite from internal and external stakeholders.



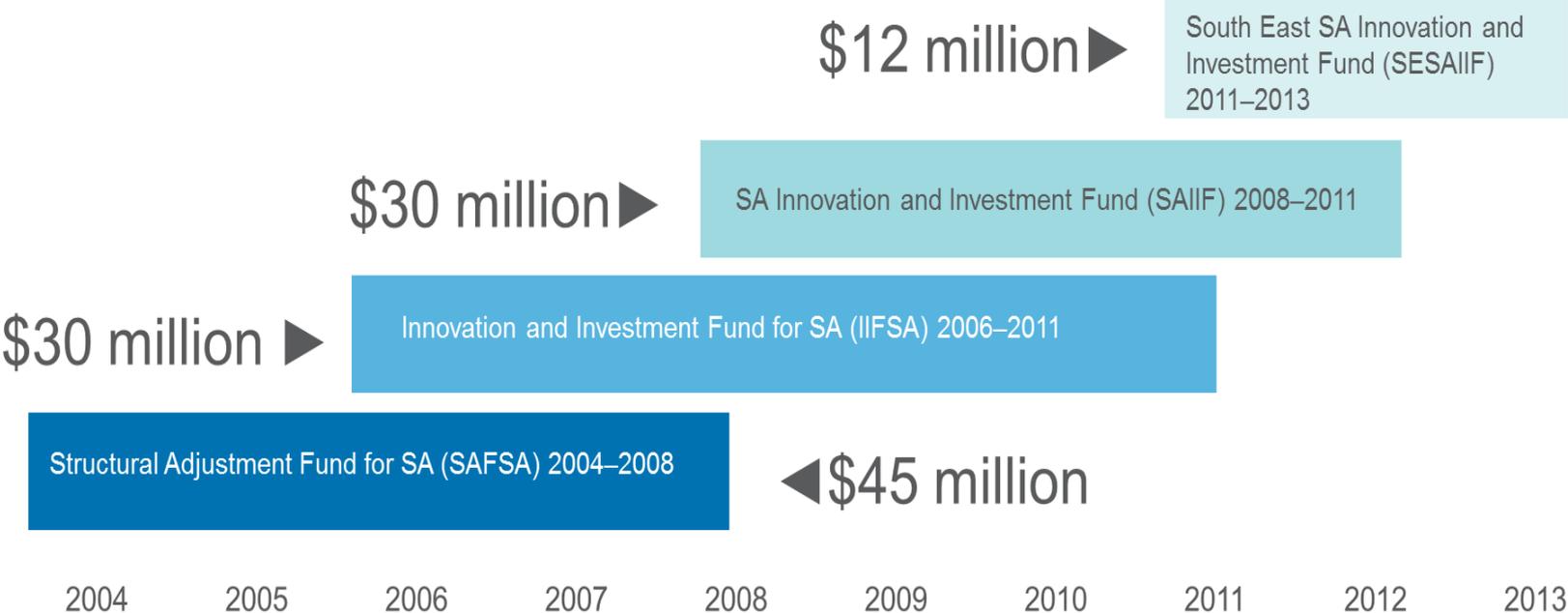
**Australian Government**  
**Productivity Commission**

Notably the Productivity Commission:

*“...there appears to be little systematic monitoring and public reporting of the actual outcomes. The limited evaluations that have been conducted suggest the funds were not as effective as intended.”*

*“A review of the efficacy of this model of assistance is well overdue.”*

# South Australian IIFs



# South Australian IIFs

There were differences across funds, but some core features

Support investment aimed at creating sustainable new jobs and diversifying local economies.



Applicants need to demonstrate ability to co-finance projects.



Grants up to 50 per cent of eligible capital costs for projects.



Tied to specific regions.

Preference for projects that introduce new innovations and/or technology.



No funding offered for retrospective project expenditures.



# Considerable policy appetite...

...not enough data (and time!)

No shortage of interest, similar funds are still running (Tasmania). IIFs also used in Victoria and Illawarra.

Lack of an evidence base. Increased scrutiny by the PC and others.

Fragmented and sporadic program data.

The South Australian funds had already concluded — participant firms had moved on.

**Fundamentally, a lot of policy interest in whether the funds  
'worked'.**

# What we did

## Time to be pragmatic

We needed more data, without placing a reporting burden on line areas or the participant firms. So we turned to administrative tax data.

We considered the issue of standing and more broadly scope. We chose to concentrate on the performance of participant firms.

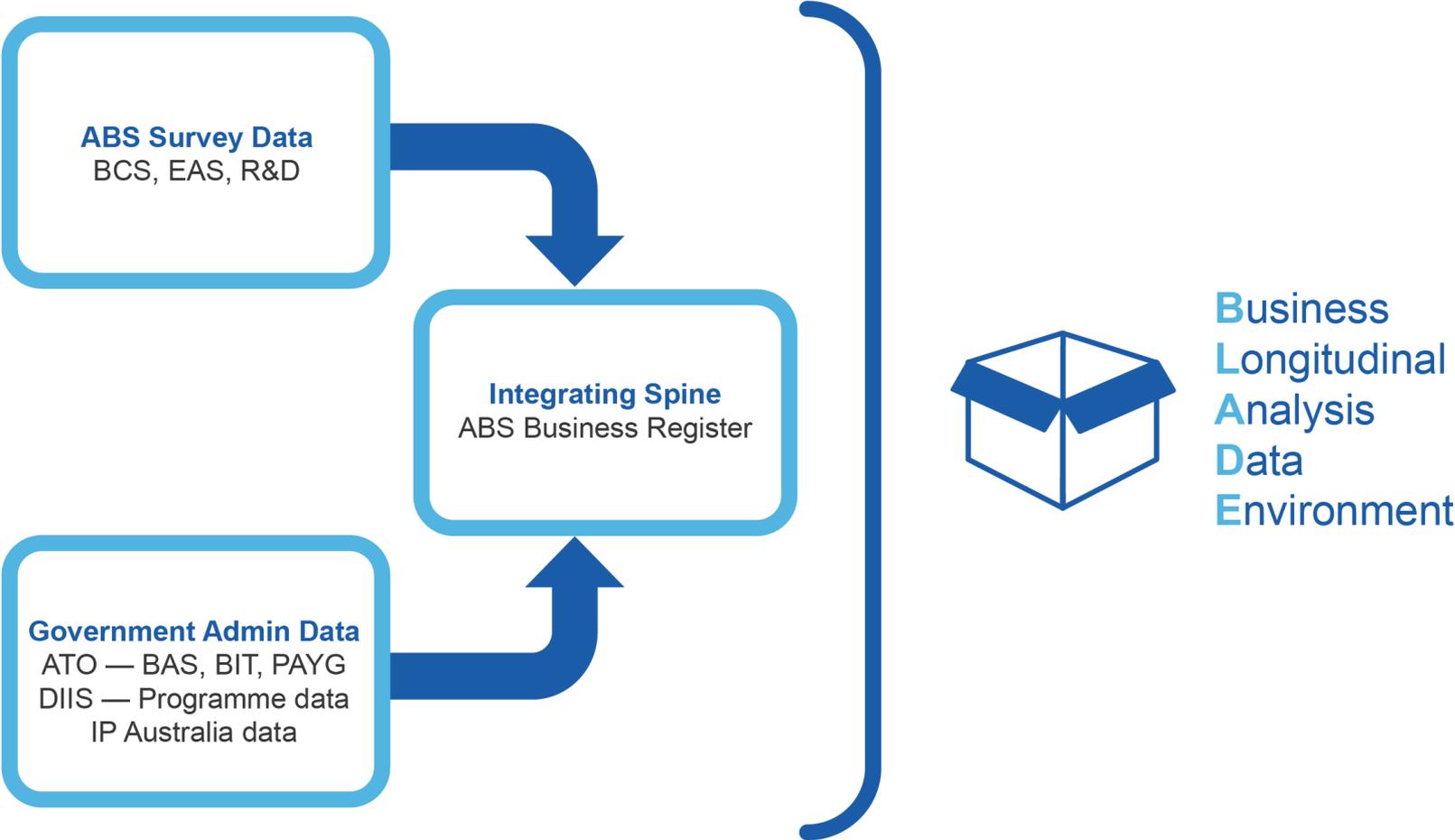
We considered various methodologies and ultimately went with a quasi-experimental matching estimator.

We engaged with relevant stakeholders for a critique of the analysis.

We used the feedback to firm-up our approach subsequent analyses of this nature.

# Turning to BLADE

## Overview

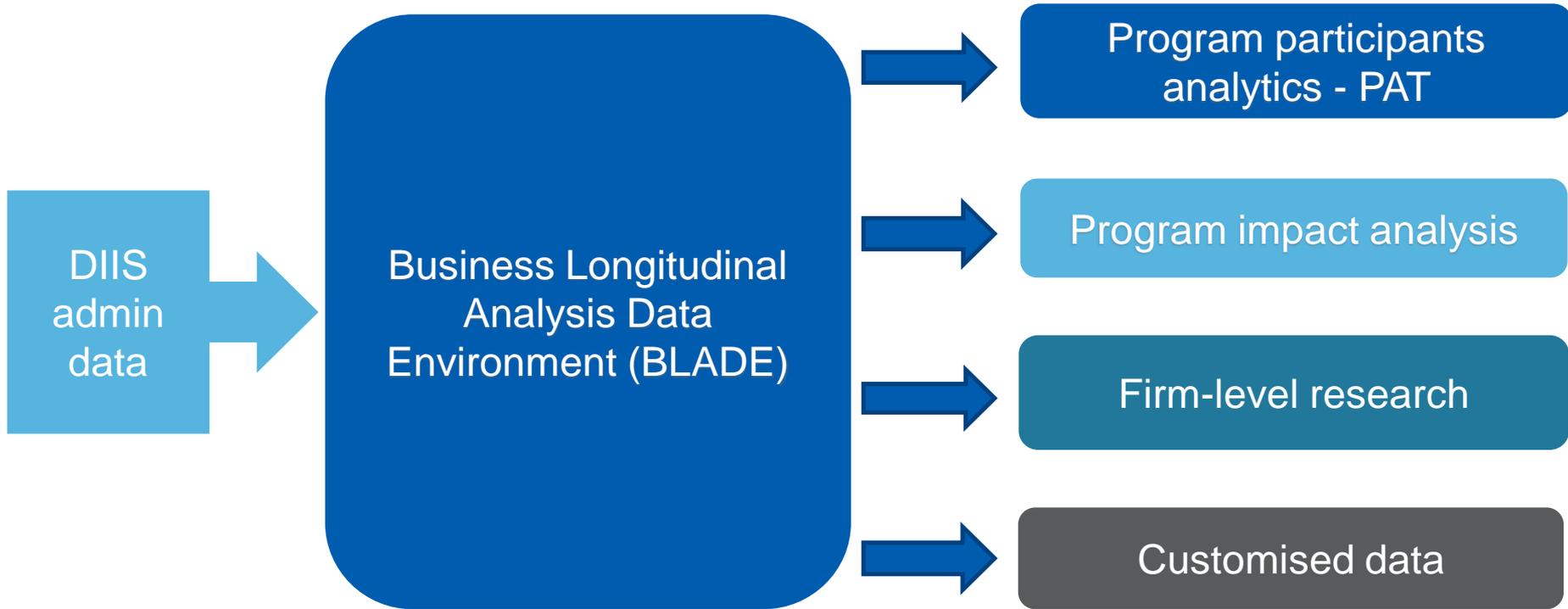


# Data within BLADE

Notable variables within each component

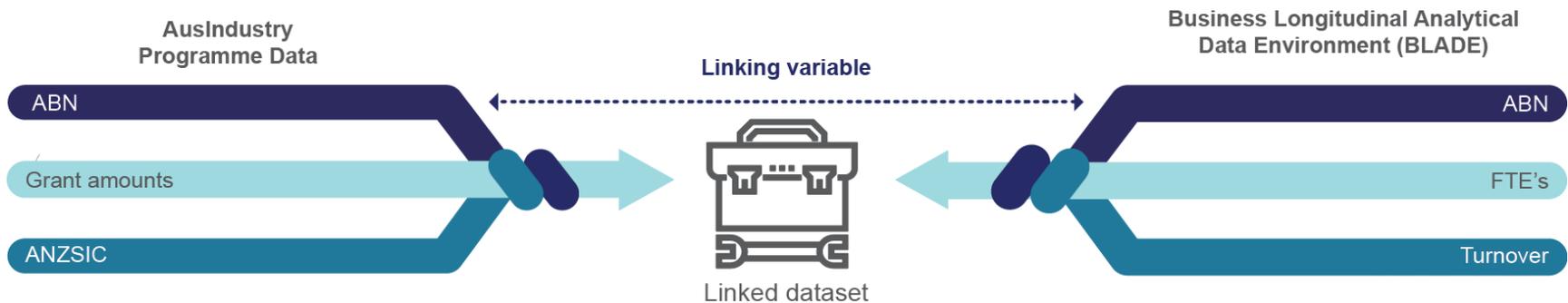
		Notable Variables
BLADE - ATO	<b>BAS</b>	Total sales, export sales, capital purchases, non-capital purchases, wages and salaries
	<b>BIT</b>	Profit or loss, taxable income or loss, cost of contractors, foreign ownership
	<b>PAYG</b>	Full time equivalent (FTE) (derived), head count of employees
BLADE - ABS SURVEYS	<b>BCS</b>	Various variables related to innovation, expenditure on innovation, nature and extent of business collaboration, extent of use of IT
	<b>EAS</b>	Inventories, earnings before interest and tax (EBIT), gross fixed capital formation
	<b>BERD</b>	Breakdown of R&D expenditure, Effort in R&D (in person years), sources of R&D funding

# How DIIS utilises BLADE



# Linking the IIF program data with BLADE

The linking process



Source: Department of Industry, Innovation and Science (2016)

*Linking results in longer time series for variables (2001–02 to 2013–14) and a richer data set.*

*Notable proportion of successful and unsuccessful IIF applicant firms from the Manufacturing sector.*

# Issues Remained

Despite linking IIF program data to BLADE some challenges remained



Dealing with complex firms (TAUs that are part of an Enterprise Group)

Within BLADE these TAUs are not created on the basis of location, so they may operate in more than one Australian jurisdiction



Without controlling for location the analysis of the complex firms would be biased



For these firms there is no reliable way to disaggregate the data on key variables such as FTE and Turnover to isolate the South Australian component



About half of the firms in the linked data were complex



# In general, Big Data ≠ Good Data

## Cons

- Very limited geographical information
- Some issues with longitudinal links (firms change reporting ABN)
- Admin data is not collected for statistical purposes, needs cleaning, imputation, hard decision making, etc.
- How to treat complex firms?

## Pros

- The backbone is a census of firms
- Very extensive financial and operational information
- Through linkage to BCS and BERD: info on innovation, business decisions, and ICT.
- Potential to add more and more data sets

# Methodological issues and assumptions

## A lot to consider

Was assignment random? Unlikely.

What should we match on? What are our outcome variables?

Conditional independence (selection on observables).

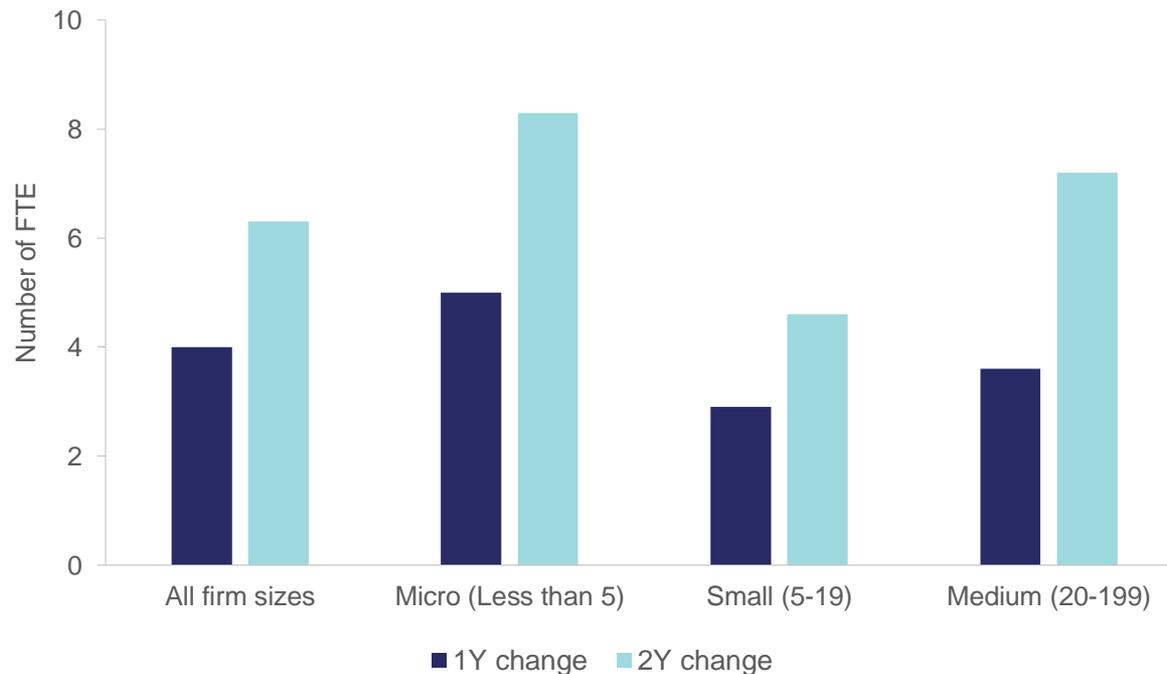
Identification assumption (overlap assumption).

Would an RCT be better? Most likely, but we are pragmatists, remember? Would it be ethical? How would it even work for a retrospective analysis? What would be the cost?

# Results

All that build-up... participants firms created more employment...

Additionality in employment (number of FTE), average treatment effect – Simple South Australian IIF firms

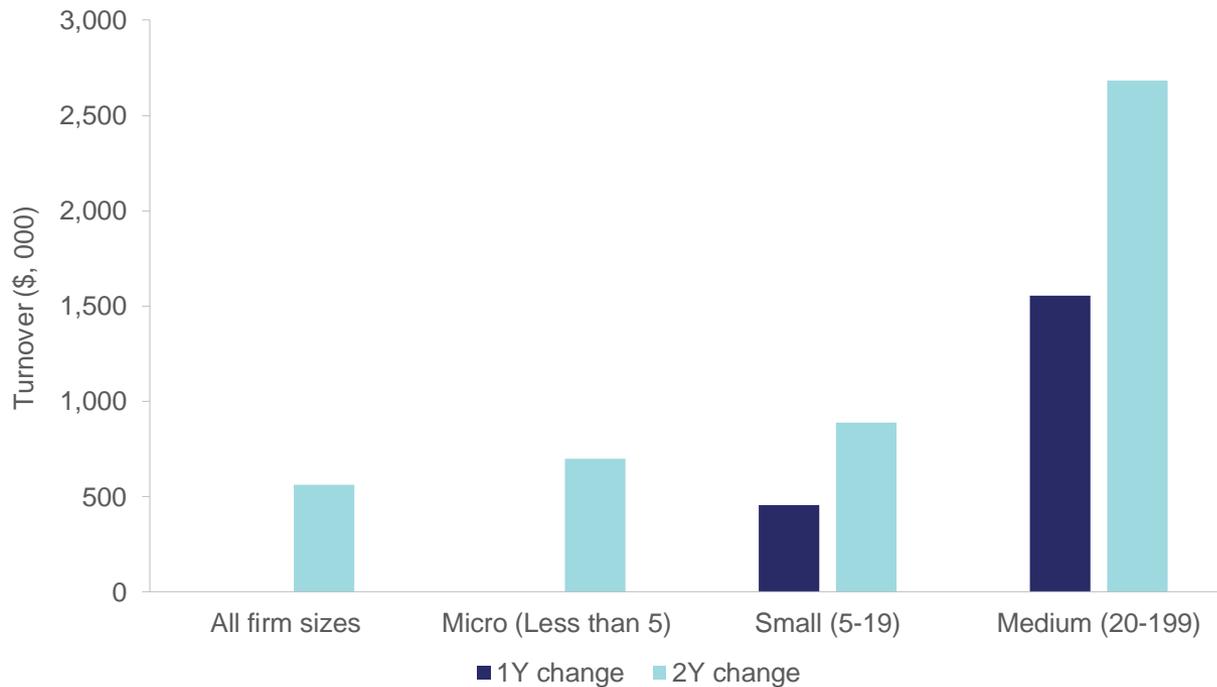


Notes: Length of the bars depicts the premium in FTE change relative to the counterfactual. Firms size was controlled for by using initial employment size as a proxy for firm size.  
Source: BLADE (2001–02 to 2013–14) Author's calculations

# Results

...and had higher turnover

Additionality in turnover (\$, 000), average treatment effect – Simple South Australian IIF firms



Notes: Length of the bars depicts the premium in turnover change relative to the counterfactual. Firms size was controlled for by using initial employment size as a proxy for firm size.  
Source: BLADE (2001–02 to 2013–14) Author's calculations

# Survival analysis

In general applicants to the funds were more likely to survive

	<i>Hazard ratio</i>	<i>Decrease in rate of failure (per cent)</i>	
IIF successful	0.478	52	***
IIF unsuccessful	0.174	83	***
Secondary sector	0.976	2	*
Tertiary sector	0.968	3	***
Average FTE	0.979	2	***
Average Turnover	1	0	
Average Capex	1	0	***
n	118,346		

Both firms that successfully applied for IIF funding and those that applied but were unsuccessful, were less likely to fail relative to non-participant South Australian firms.

Firms that were unsuccessful in securing IIF funding were less likely to fail (had a smaller hazard ratio and a greater decrease in the failure rate) than the successfully funded IIF program participant firms.

# The feedback

Response to the paper's findings was mixed

**How much of the performance differentials were due to the funds?** *Hard to say, expect it to be small. Need better data to be definitive. Need to control for more observables.*

**What about other forms of state and federal assistance?** *Most likely had an impact but relative to federal assistance the financial contribution from states was small.*

**What about the spill-over effects?** *We tried to identify potential spill-overs via input-output multiplier analysis.*

**Were benefits shifted rather than created?** *Program design attempted to safeguard against this, but potentially hard to enforce.*

**Did geography matter?** *Geography always matters.*

**Impact on the displaced workers?** *Andrew Beer has done excellent work on this.*

**Value for Money?** *PC's Efficiency and Effectiveness principles. The Holy Grail.*

# Lessons learnt – evolving is fun

Always room for improvement – the response to this paper has refined our approach

More ‘observables’ are always handy — management capability!

Linked Employer-Employee Data — prototyping phase.

A reconsideration of our choice of estimators — Inverse probability weighting (IPW), Regression Discontinuity.

Greater interest and co-operation from state government — South Australia State Gov is replicating this paper and controlling for state assistance.

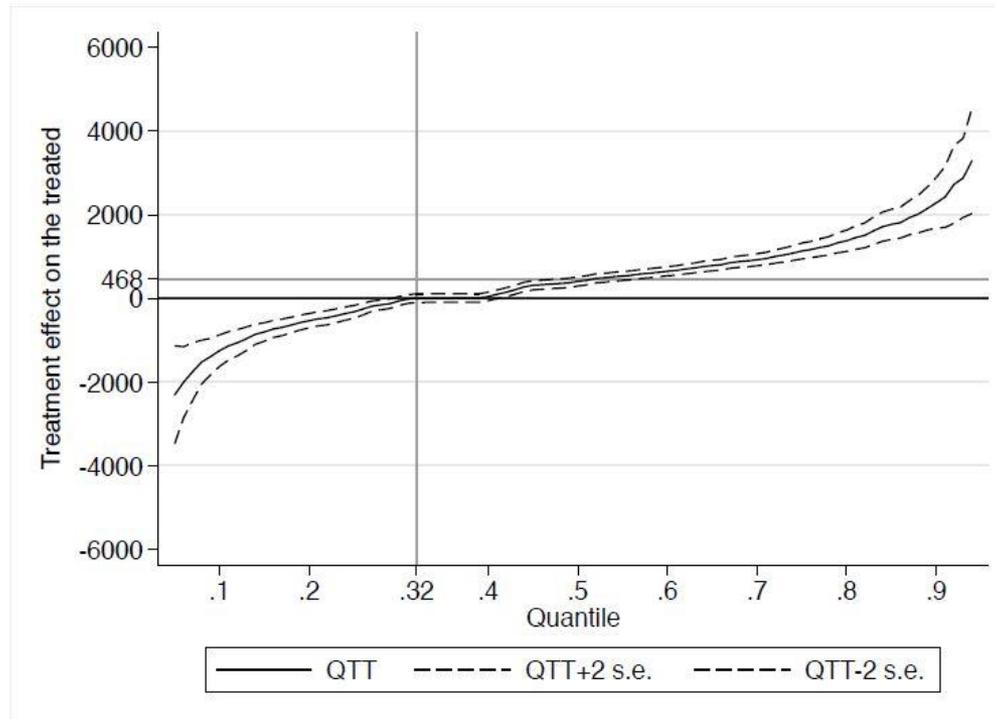
Have a better handle on BLADE — computational resources and stakeholder expectations.

Gearing up to do similar analysis on the Tasmanian IIFs — Lessons learnt also informed a recent analysis of 457 subclass visa sponsoring businesses

# Quantile treatment effects

A development to keep an eye on – Going beyond the average

## Tax debt payments



Gillitzer, C. and Sinning, M. (2018): Nudging Business to Pay Their Taxes: Does Timing Matter? IZA Discussion Paper No. 11599.

# Key takeaways

There is no one size fits all approach

[A mixed methods approach is preferable](#) to an exclusively quantitative or qualitative approach.

[Experimentation has value](#) even if immediate policy pay-offs are small.

Creating buy-in for more substantive evaluation work requires [demonstration effects](#) of the utility of such analysis.

[Be pragmatic, rather than a perfectionist or theorist.](#) Waiting to do an evaluation until all the analytical and data pieces are in place is commendable, but hardly feasible for our policy partners.

*'You may have a world class kitchen, but you are are useless without ingredients'*. The importance of reliable data — The DIIS *Evaluation Ready Framework* will enable better evaluations in the future.

[Talk to stakeholders.](#) Early, often, and at all stages of the process.

# Further reading

## A few useful resources



### Data Survey

#### Firm-Level Analysis Using the ABS' Business Longitudinal Analysis Data Environment (BLADE)

David Hansell and Bilal Rafi\*

##### Abstract

The Australian Bureau of Statistics' (ABS) Business Longitudinal Analysis Data Environment (BLADE) is the most comprehensive firm-level statistical asset in Australia. This short overview provides readers a window into what data sources are used, how they are integrated, current and future applications and how these can contribute to evidence-based policy making in Australia. At present, direct access is limited to staff directly employed by the Australian Statistician or through secondment.

##### 1. Introduction

Until recently, researchers wishing to analyse Australian firms have been limited to either proprietary datasets or ABS survey data, such as the Business Longitudinal Survey (BLS) or the Business Longitudinal Database (BLD). While the BLS has rich content, it spanned only four years, from 1994–95.<sup>1</sup> Further, while the BLD is more recent, with rolling panels starting from 2005–06, it is focused on small to medium-sized enterprises. The Business Longitudinal Analysis Data Environment (BLADE) fills these and other gaps for authorised researchers. Compared to other advanced economies, Australia lags behind in the construction of firm-level databases.<sup>2</sup> BLADE can enable better use of the Australian government's data holdings and contribute to the greater use of evidence-based policy-making.

This article is structured as follows. Sections 2 and 3 describe the integration methodology and information available within BLADE.

Firm-Level Analysis Using the ABS' Business Longitudinal Analysis Data Environment (BLADE)  
<https://onlinelibrary.wiley.com/doi/abs/10.1111/1467-8462.12253>

The screenshot shows the website of the Office of the Chief Economist, Department of Industry, Innovation and Science. The page is titled "Staff Research Papers" and lists several research papers from 2017 and 2016. The 2017 papers include:

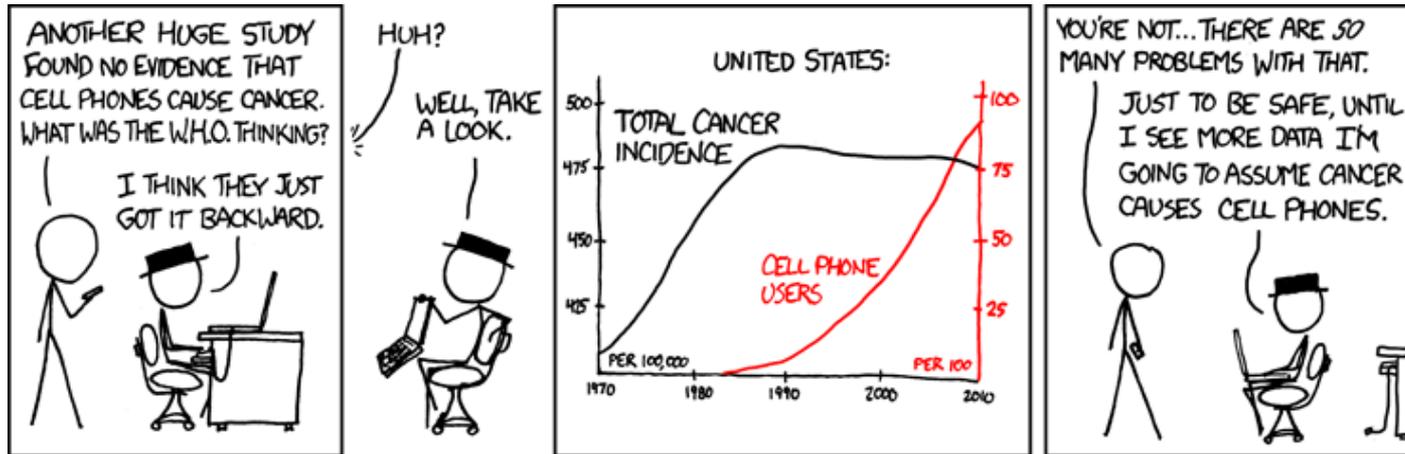
- Research Paper 1/2017 - Participation in South Australian Innovation and Investment Funds: performance Bilal Rafi
- Research Paper 2/2017 - The role of spillovers in research and development expenditure in 7 Saxon Bakhtian and Robert Biewing
- Research Paper 3/2017 - The impact of labour market regulation on the unemployment rate economists Bilal Rafi
- Research Paper 4/2017 - The performance and characteristics of Australian firms with Ewold Luke Hendrickson, Toni Pachernegg, Maria Boyle, Stan Bucfal and David Hansell
- Research Paper 5/2017 - Entrepreneurship Dynamics in Australia: Lessons from Micro-data Saxon Bakhtian

The 2016 papers include:

- Research Paper 1/2016 - The effect of age on Australian small-to-medium enterprises Roger Smith and Luke Hendrickson
- Research Paper 2/2016 - Updating investment estimates for Australia's organisational capital Stan Bucfal and Francis Bule
- Research Paper 3/2016 - Modelling the relationship between innovation and exports: Ewold Razi Tuhi

OCE Staff research papers  
<https://www.industry.gov.au/data-and-publications/staff-research-papers>

# Questions



<https://xkcd.com/>

## Bilal Rafi

Senior Economist

Insights and Evaluation Branch

Office of the Chief Economist

Phone: (02) 6276 1946

Email: [bilal.rafi@industry.gov.au](mailto:bilal.rafi@industry.gov.au)

 Follow us [@economist\\_chief](https://twitter.com/economist_chief)