

The Decision Maker Panel

Nick Bloom (Stanford), Phil Bunn (Bank of England), Scarlet Chen (Stanford) Paul Mizen (Nottingham), Pawel Smietanka (Bank of England), Greg Thwaites (Bank of England)

November 2018



Disclaimer: Any opinions and conclusions expressed herein are those of the authors and do not necessarily represent the views of the Bank of England or its Committees.

The Decision Maker Panel

The University of Nottingham, Bank of England and Stanford University has launched [Decision Maker Panel](#). It receives £1.3m funding from the ESRC and other sources.

DMP is a [monthly](#) survey of [CFOs](#) who are recruited from a sample frame of firms by trained analysts at University of Nottingham.

[£1.3m](#) from ESRC, Bank of England, Nottingham and Stanford Universities; [>100 staff](#) and about [7000](#) firms were in the panel in November 2018. Adds about 600 firms per month.

DMP members are polled regularly about their [expectations](#) for business conditions (sales and costs) and [decisions](#) (price setting, hiring, investing).

Closely related to other surveys e.g. Atlanta Fed-Stanford, EPU, World Management Survey, MES (ONS)

Decision Maker Panel

Basic Data

Impact of Brexit

Sampling Strategy

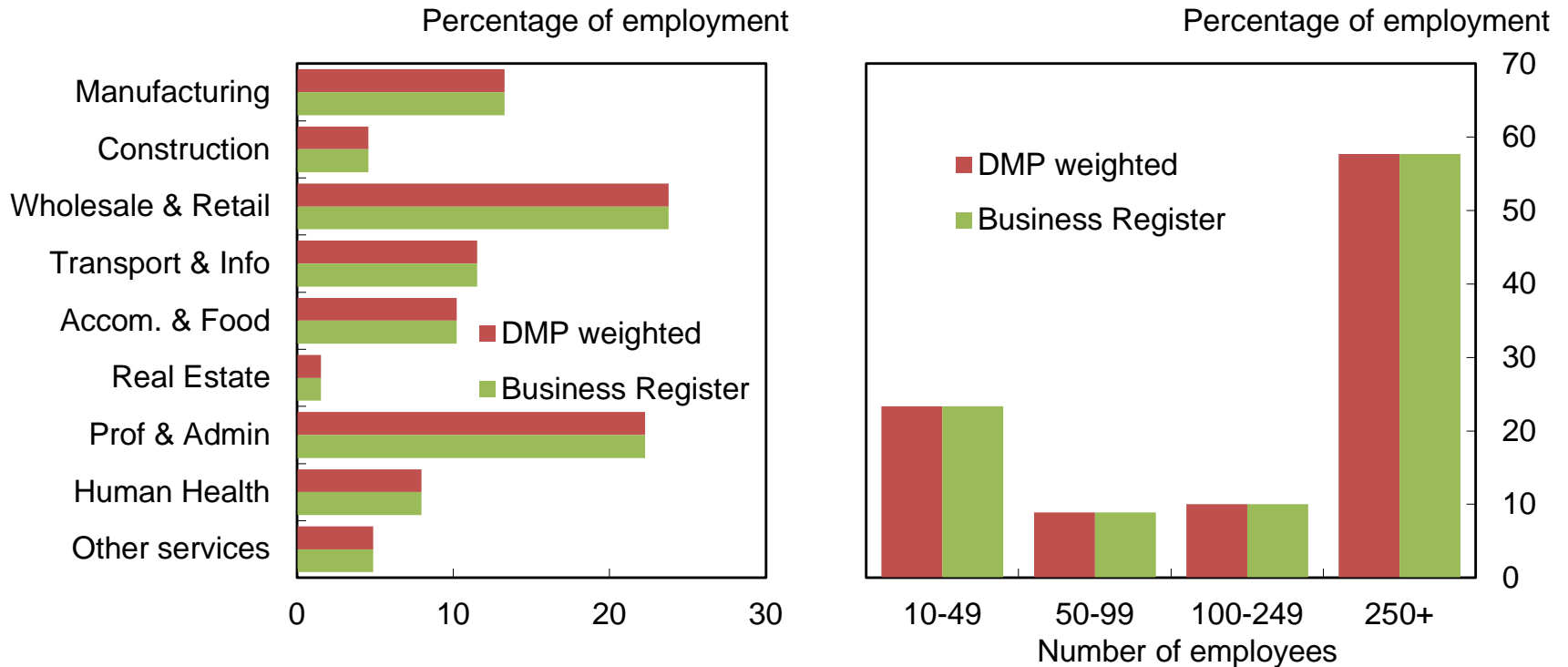
Firms with 10+ employees

Have UK trading address and telephone contact details

Covers ten: sectors: manufacturing, construction, wholesale/retail, transport& info, accom & food, real estate, prof & admin, human health, other services and finance.

Covers entire UK (England, Wales, Scotland, Northern Ireland)

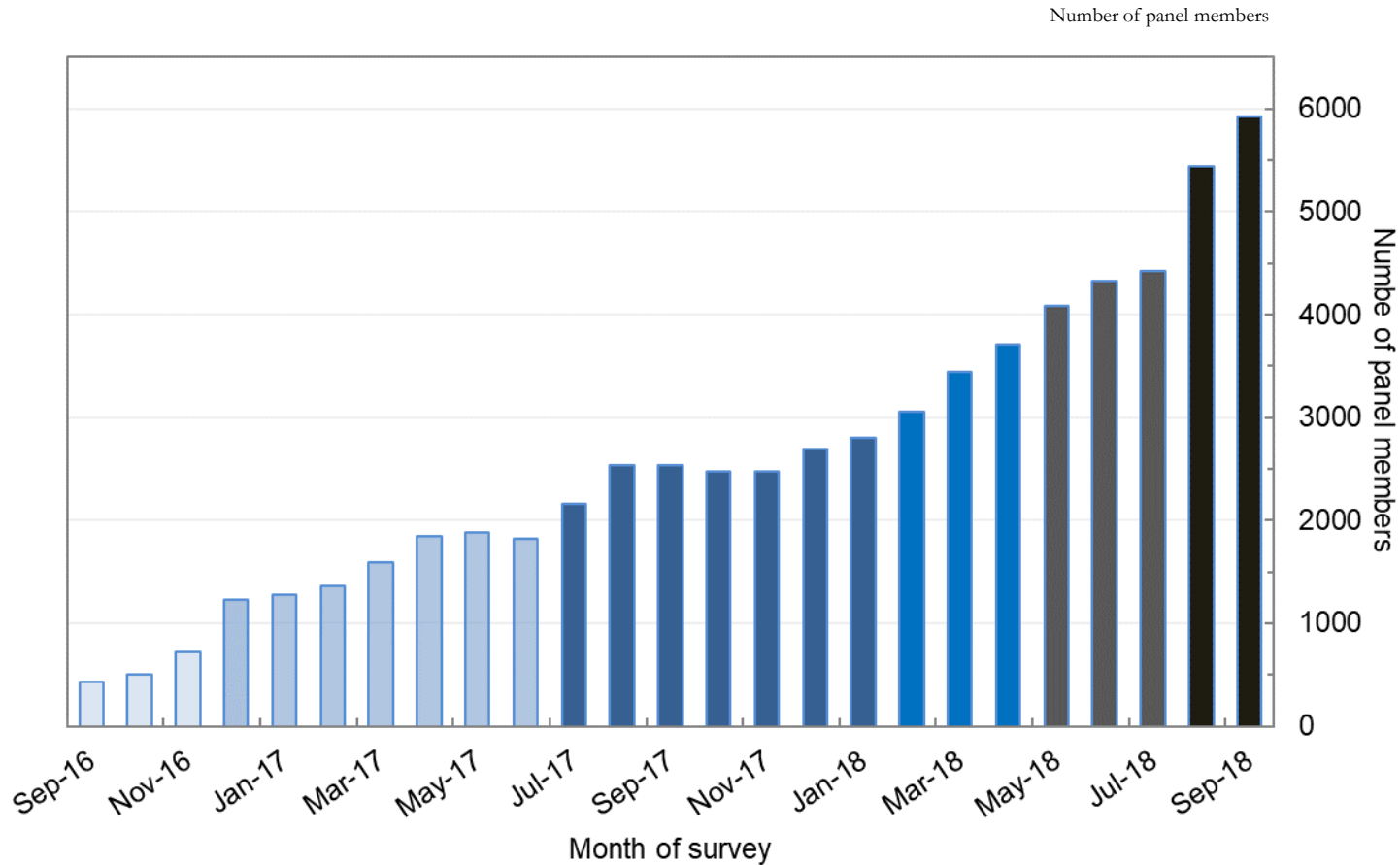
DMP sample matches the pattern in the UK Business Register *by design*



The panel covers nine sectors, and since Jan 2018 include financial firms. It covers large firms and SMEs.

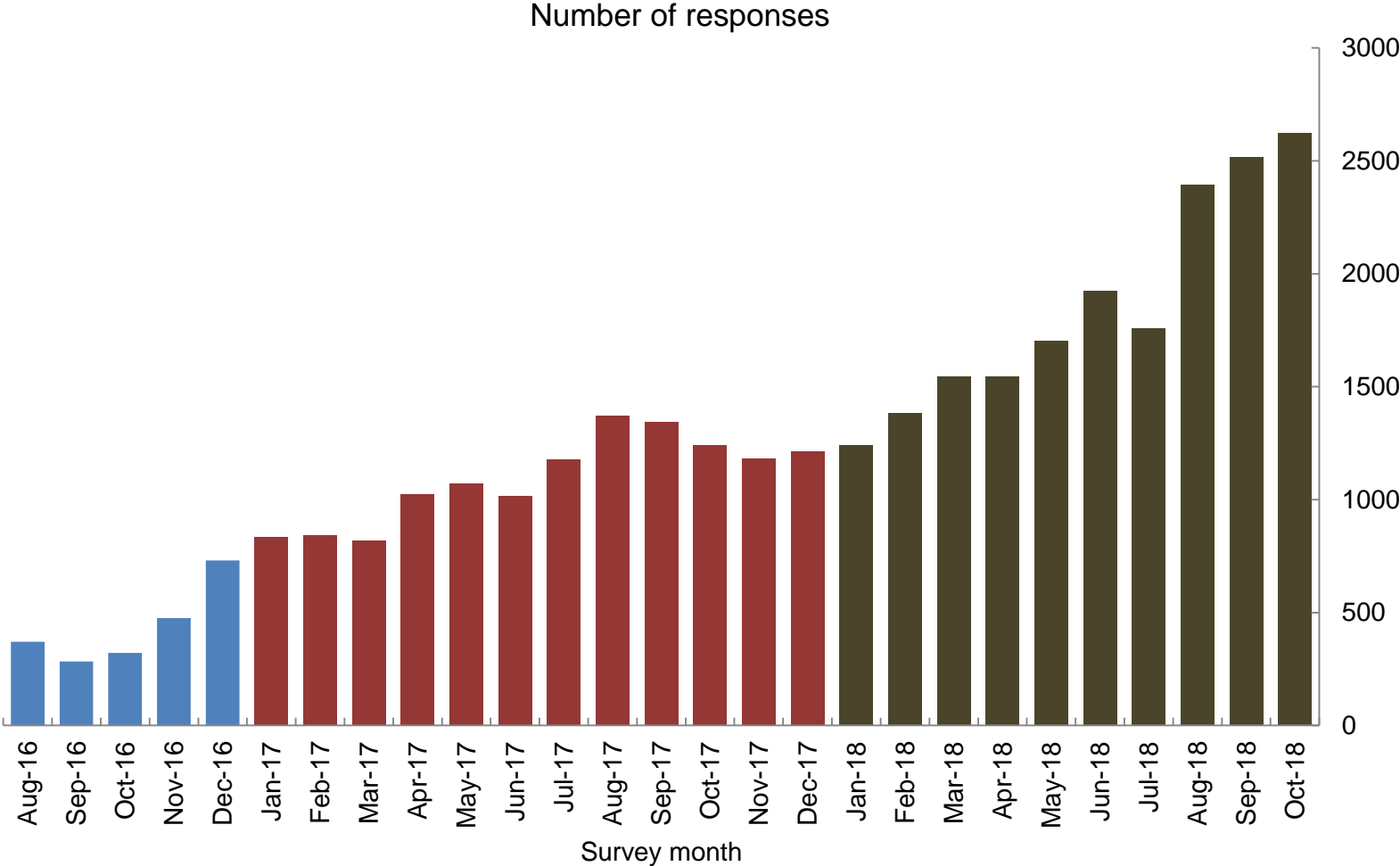
We can match firms to a financial database giving their characteristics e.g. size, leverage, profitability, cash flow, etc.

The panel comprised around 7,000 firms in November 2018



Response rate is around 45% in any given month

By November 2018 obtaining 2800 responses per month spanning all industries and regions



Source: Decision Maker Panel

Quick monthly internet survey – e.g. sales question



BANK OF ENGLAND

Decision Maker Panel (September 2018)

3. Looking a year ahead from the second quarter of 2018 to the second quarter of 2019, by what % amount do you expect your **SALES REVENUE** to have changed in each of the following scenarios?

The LOWEST % change in sales revenue would be about:

0.0 %

A LOW % change in sales revenue would be about:

3.0 %

A MIDDLE % change in sales revenue would be about:

5.0 %

A HIGH % change in sales revenue would be about:

7.0 %

The HIGHEST % change in sales revenue would be about:

10.0 %

Back

Next

Quick monthly internet survey – e.g. sales question



BANK OF ENGLAND

Decision Maker Panel (September 2018)

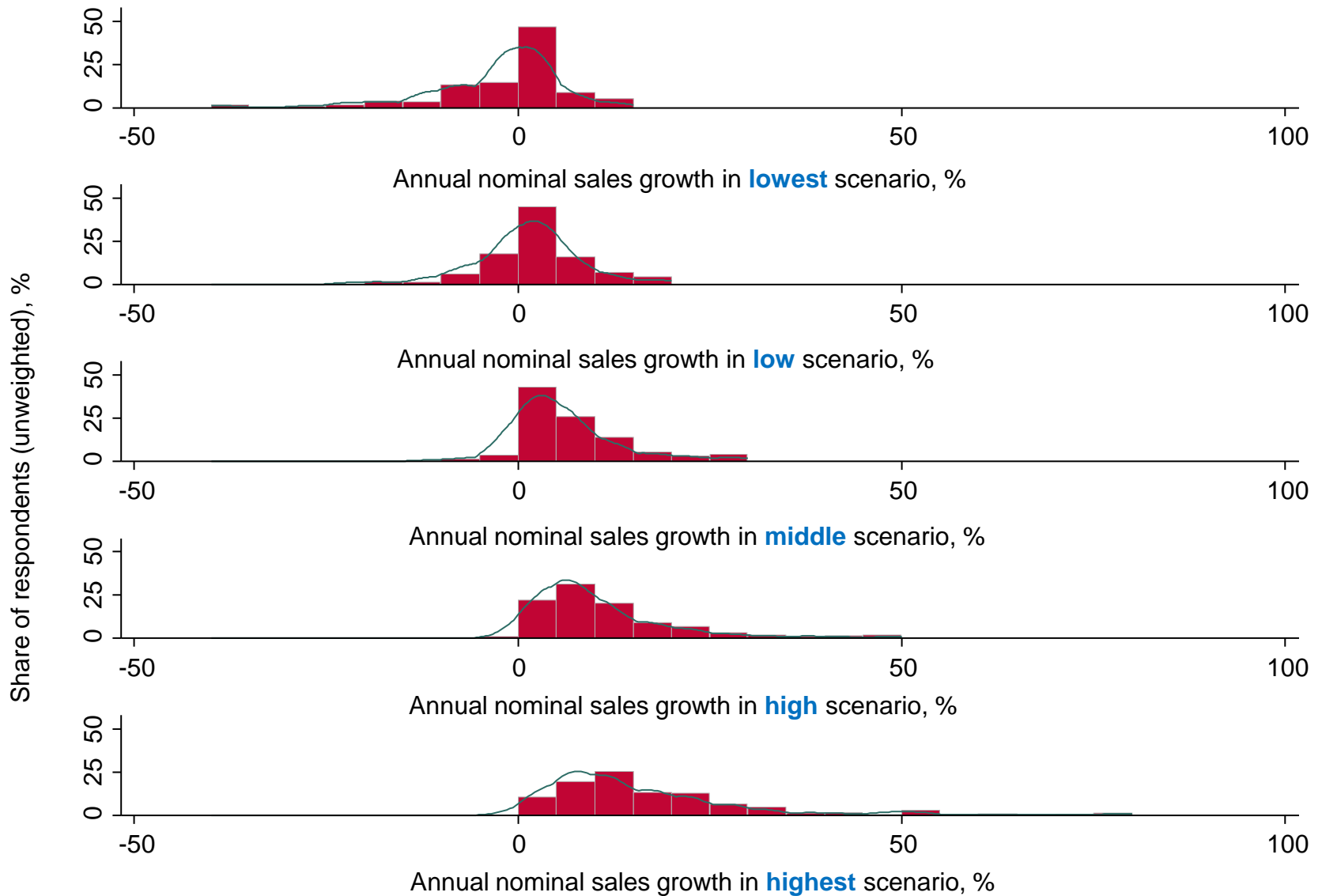
4. Please assign a percentage likelihood (probability) to the % changes in SALES REVENUE you entered (values should sum to 100).

LOWEST: The likelihood of realising about 0.0 % would be:	<input type="text" value="10"/>
LOW: The likelihood of realising about 3.0 % would be:	<input type="text" value="20"/>
MIDDLE: The likelihood of realising about 5.0 % would be:	<input type="text" value="40"/>
HIGH: The likelihood of realising about 7.0 % would be:	<input type="text" value="20"/>
HIGHEST: The likelihood of realising about 10.0 % would be:	<input type="text" value="10"/>
Total	<input type="text" value="100"/>

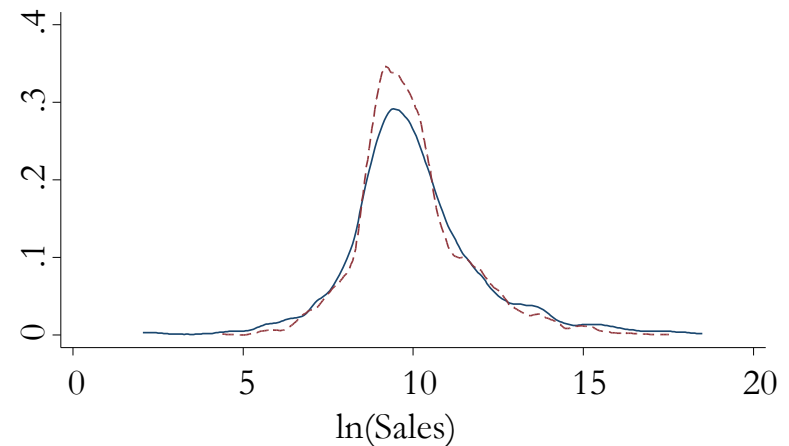
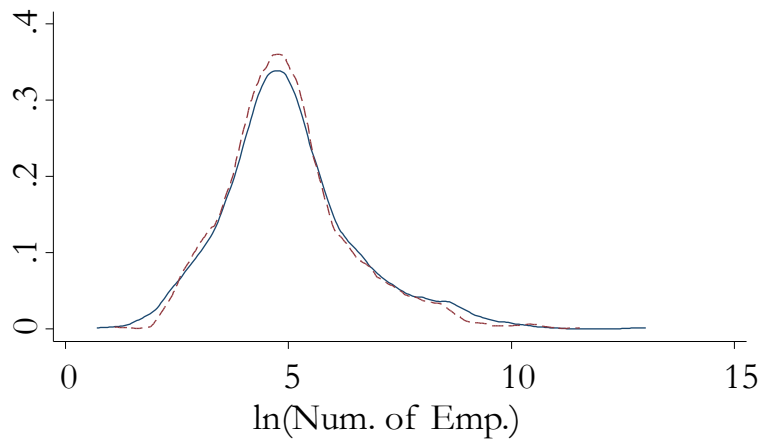
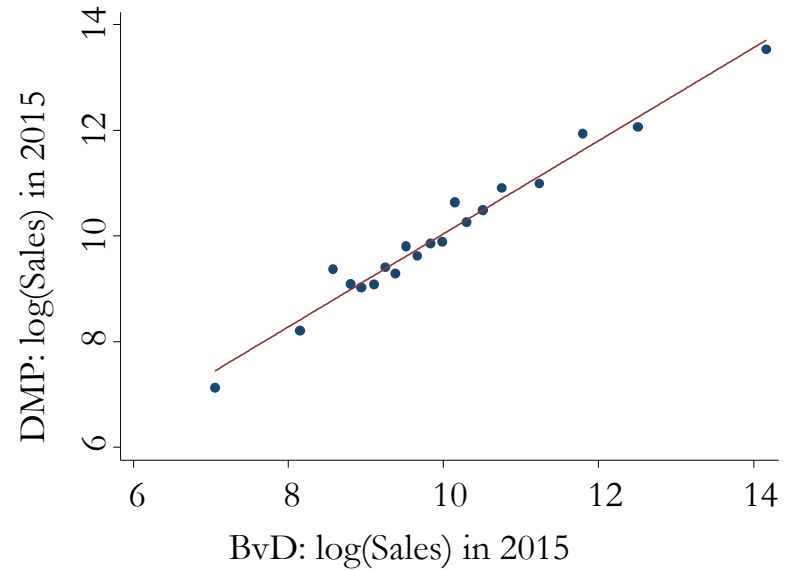
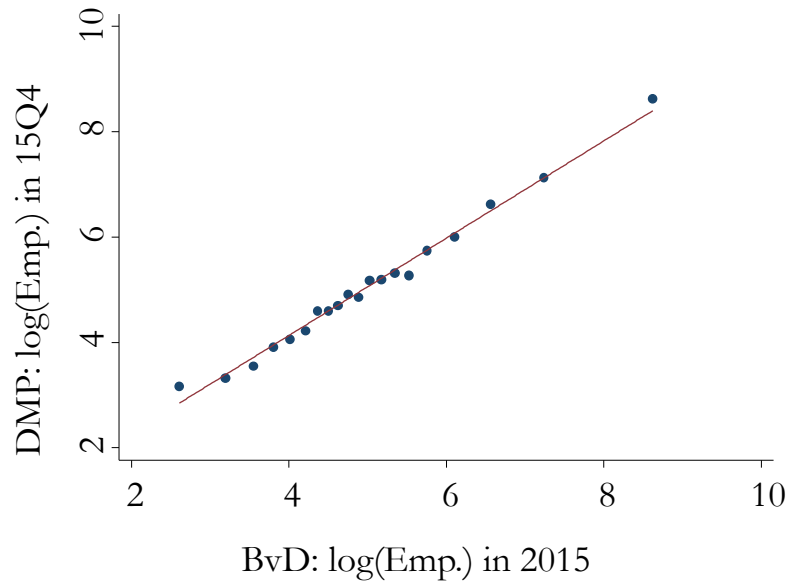
Back

Next

Average data for sales growth scenarios



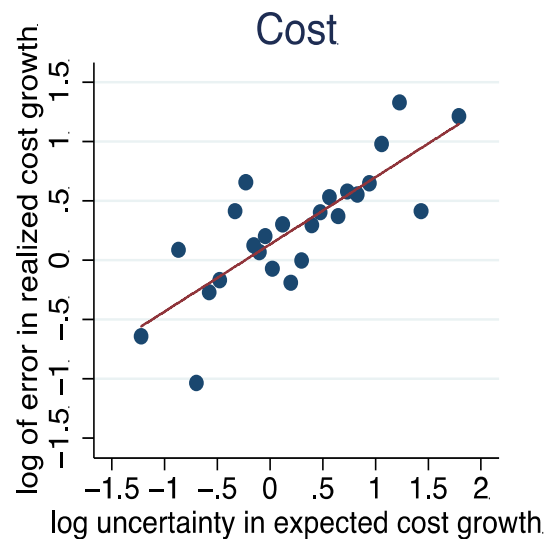
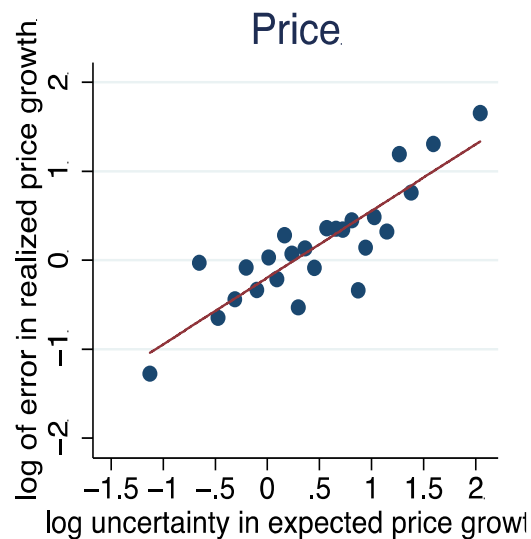
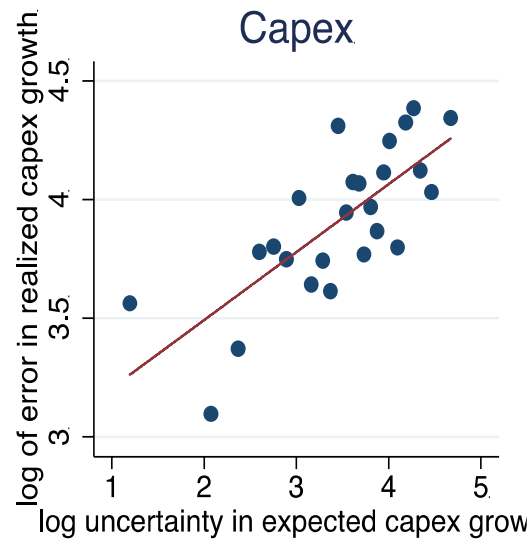
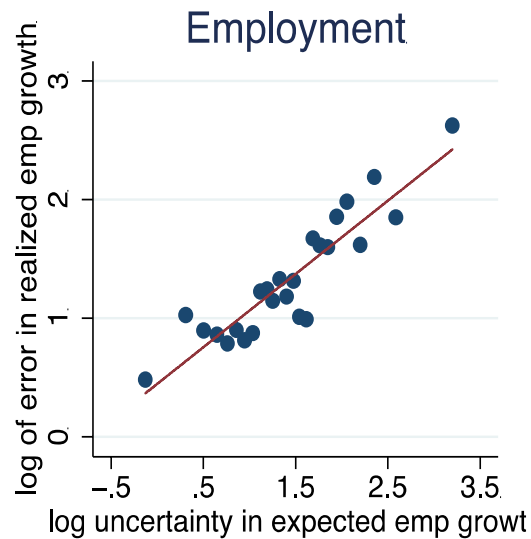
Data quality looks good – for example, comparing DMP to Company Accounts



— DMP: ln(Emp.) in 2015Q4
- - - BvD: ln(Emp.) in 2015

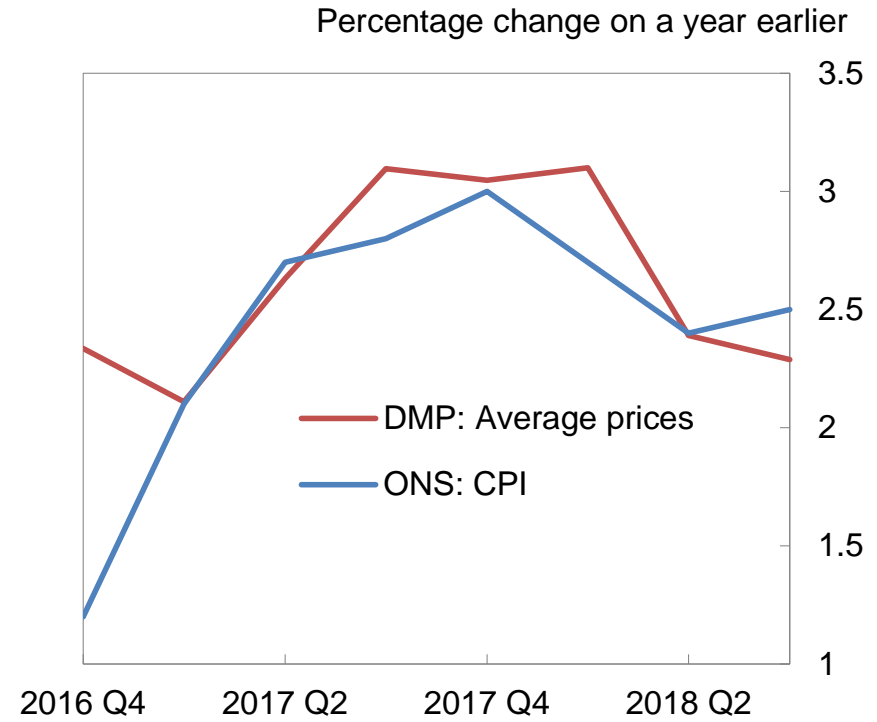
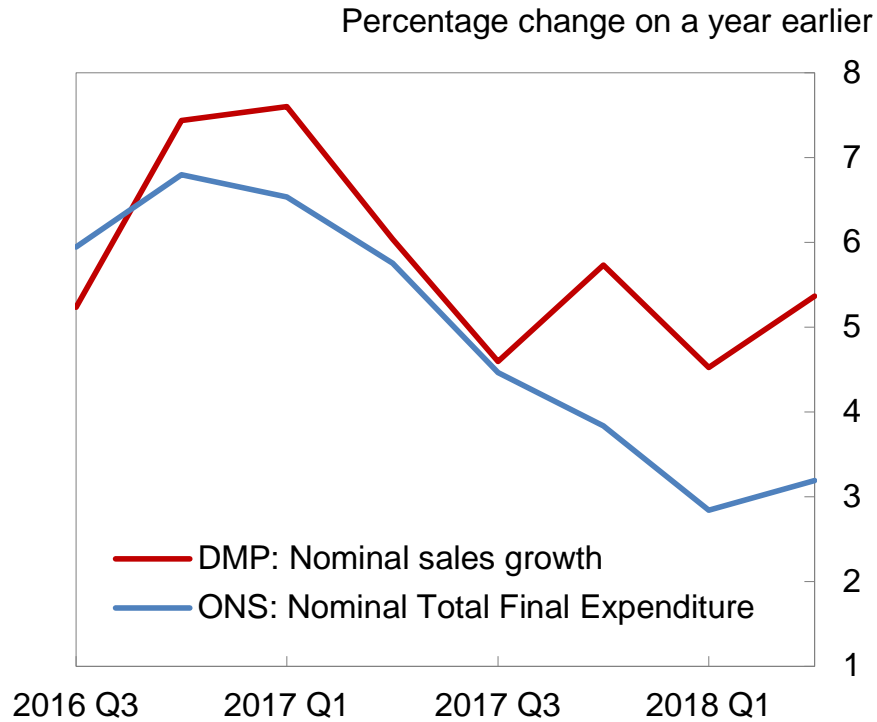
— DMP: ln(Sales) in 2015
- - - BvD: ln(Turnover) in 2015

Data quality looks good – for example, uncertainty and forecast errors



Note: Uncertainty defined as subjective uncertainty from the DMP 5-bin responses. Forecast errors defined as $|\text{forecast-actual}|$ growth over the following 12 month period

Data quality looks good – macro aggregates



Decision Maker Panel

Policy Impact

What Other Evidence Can We Provide?

Already part of the monetary policy machinery...



“the Bank has been building on the 3,000-member Decision Maker Panel, which has helped in the assessment of the potential impact of Brexit”



“there is value in [DMP] market intelligence and the key is to extract the insights”



“the amount and quality is increasing and the aim is to ensure that policymakers got the full benefit of that”

April 2018

How is Decision Maker Data used?

Bank of England

- Agents' Briefing (quarterly) on BoE website.
- MPC decisions (MPC minutes)
- Governors and MPC speeches and evidence to Parliament)
- Governor press conferences for Inflation Report

Brexit is not over, there will be more uncertainty to evaluate. There will be other uncertainty shocks in the future.

Agents' Briefing (quarterly)



BANK OF ENGLAND

Agents' summary of business conditions and results from the Decision Maker Panel Survey

Box 2

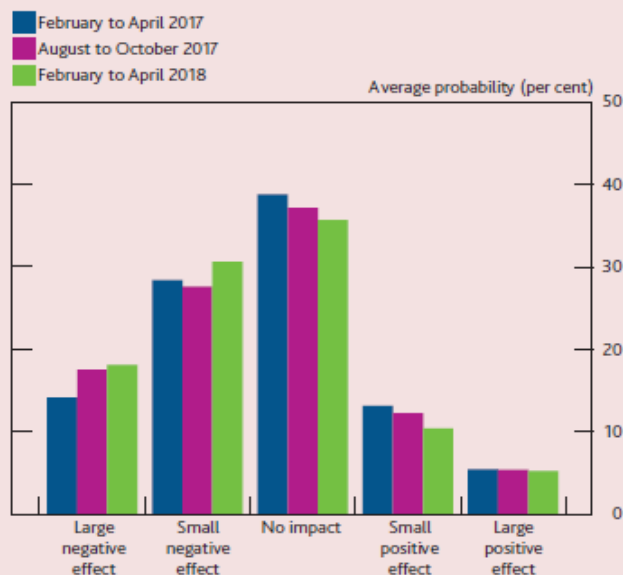
Results from the Decision Maker Panel survey

Overview

Together with academics from Stanford University and the University of Nottingham, the Bank has developed the Decision Maker Panel (DMP) survey to help monitor recent developments in the UK economy and to track businesses' expectations and the uncertainty surrounding them.⁽¹⁾ The DMP is particularly valuable in helping to assess the implications for UK businesses ahead of the United Kingdom's withdrawal from the European Union. The more quantitative responses from the DMP survey complement the more qualitative intelligence gathered from Bank Agents' contacts.

The panel comprises Chief Financial Officers (CFOs) from small, medium and large UK companies operating in a broad range of industries and is designed to be representative of the population of UK businesses.⁽²⁾ The panel is continuing to expand; at the time of the April DMP survey around 4,000

Chart A Expected eventual impact of Brexit on sales^(a)

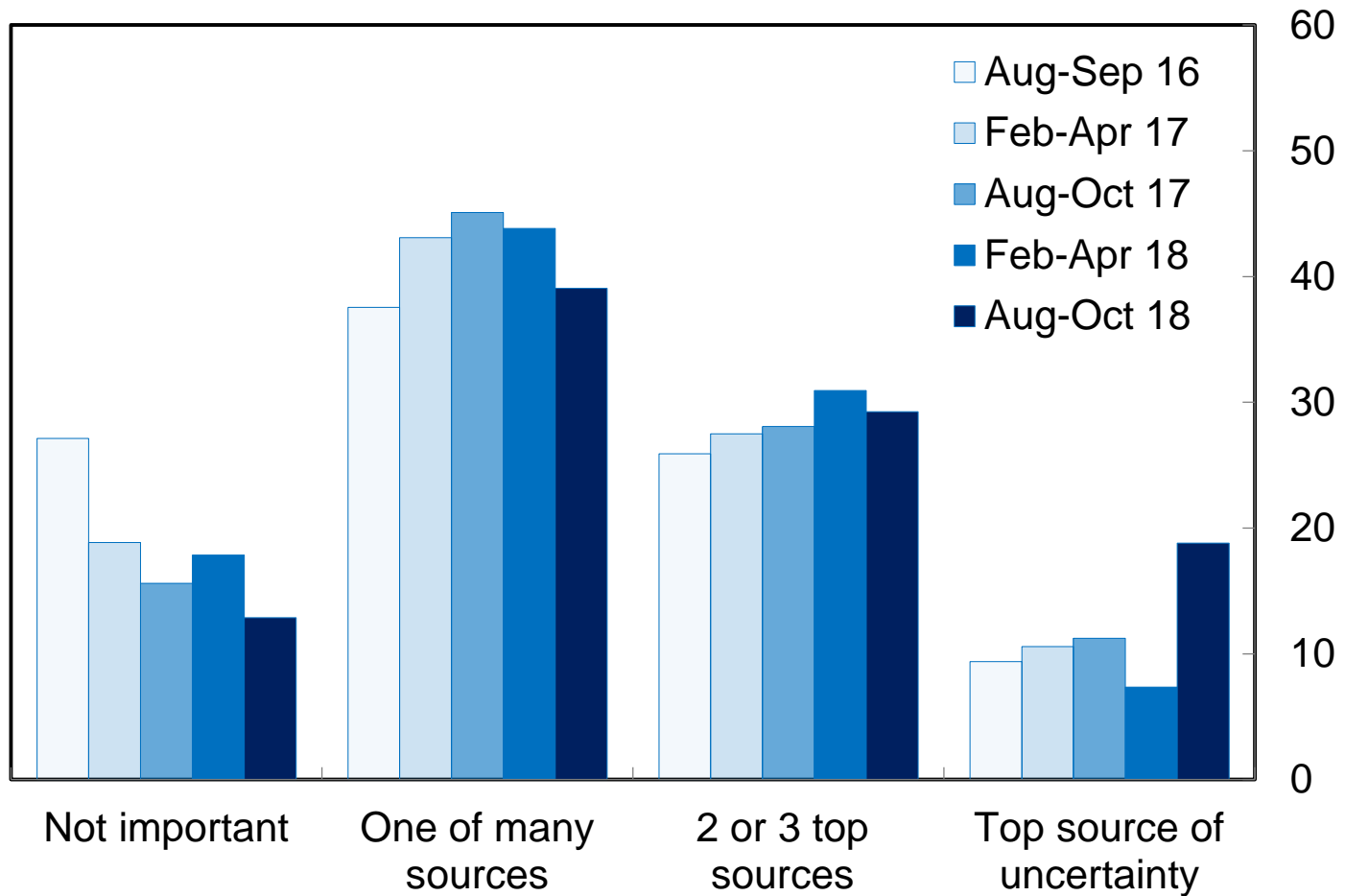


Sources: DMP and Bank calculations.

(a) Question: 'The Prime Minister has said that the UK government does 'not seek membership of the Single Market. Instead we seek the greatest possible access to it through a new, comprehensive, bold and ambitious Free Trade Agreement.' How likely do you think it is that the eventual agreement will have the following effects, compared to what would have been the case had the UK remained a member of the EU?'. A large effect corresponds to changing sales at home and abroad by 10% or more, a small effect is defined as less than 10%.

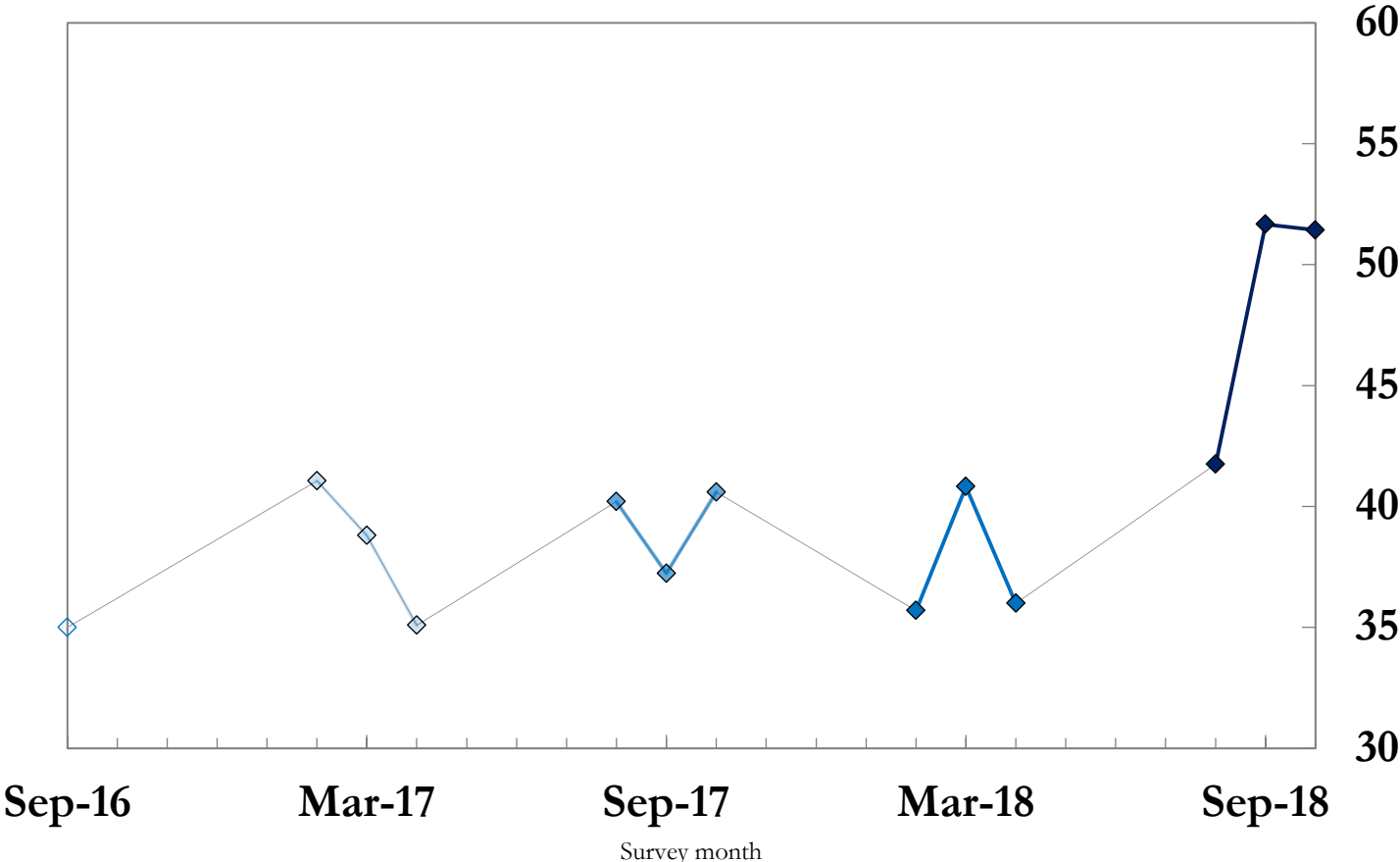
MPC decisions: Brexit important source of uncertainty for 40%+

Share of respondents (per cent)



MPC Decisions: Brexit as Top Three Sources of Uncertainty

Percentage of respondents who see Brexit as top 3 current sources of uncertainty



MPC Decisions

Monetary Policy Summary and minutes of the Monetary Policy Committee meeting ending on 31 October 2018

18 On the latest official data, business investment had fallen in both 2018 Q1 and Q2, and the near-term outlook appeared subdued. There had been signs of a step-up in uncertainty among businesses regarding the Brexit process and the effects of that uncertainty on activity. The Bank's Decision Maker Panel Survey had found that more than 50% of firms identified Brexit as being in their top three sources of uncertainty in September and October, a rise of around ten percentage points from the survey in August. Respondents to the 2018 *Deloitte CFO Survey* viewed Brexit as the biggest risk facing their business, on average, with sentiment towards its long-term impact turning increasingly negative. It was likely that this uncertainty was dragging on business investment: both the Bank's Agents and the CBI *Quarterly Industrial Trends Survey* had reported a

Governors and MPC speeches and evidence

- Decision Maker Panel has been cited in Parliament (Treasury Select Committee) as evidence on Brexit effects

<https://parliamentlive.tv/Event/Index/5e488895-c9c2-46d7-811a-8f902302596f>

(10:07:18 Tuesday 20th November 2018, Andy Haldane)

Governor press conferences for Inflation Report

- The Governor has used the information to introduce the Inflation Report e.g. May 2018

<https://www.bankofengland.co.uk/inflation-report/2018/may-2018>

(3:00 5 May 2018 Governor, Mark Carney)

HM Treasury - BEIS

- **Budget 2018:**

Chancellor, Philip Hammond **raised the Annual Investment Allowance** to £1 million from 1 Jan 2019 to 31 Dec 2020 in a policy measure designed to offset uncertainty due to Brexit

- **Industrial Strategy:**

British Productivity Review (to which DMP contributed), and informed the UK Industrial Strategy. Secretary of State for Business, Greg Clark, set up a new **Industrial Strategy Council** in October 2018 with Andy Haldane as its chair.

Decision Maker Panel

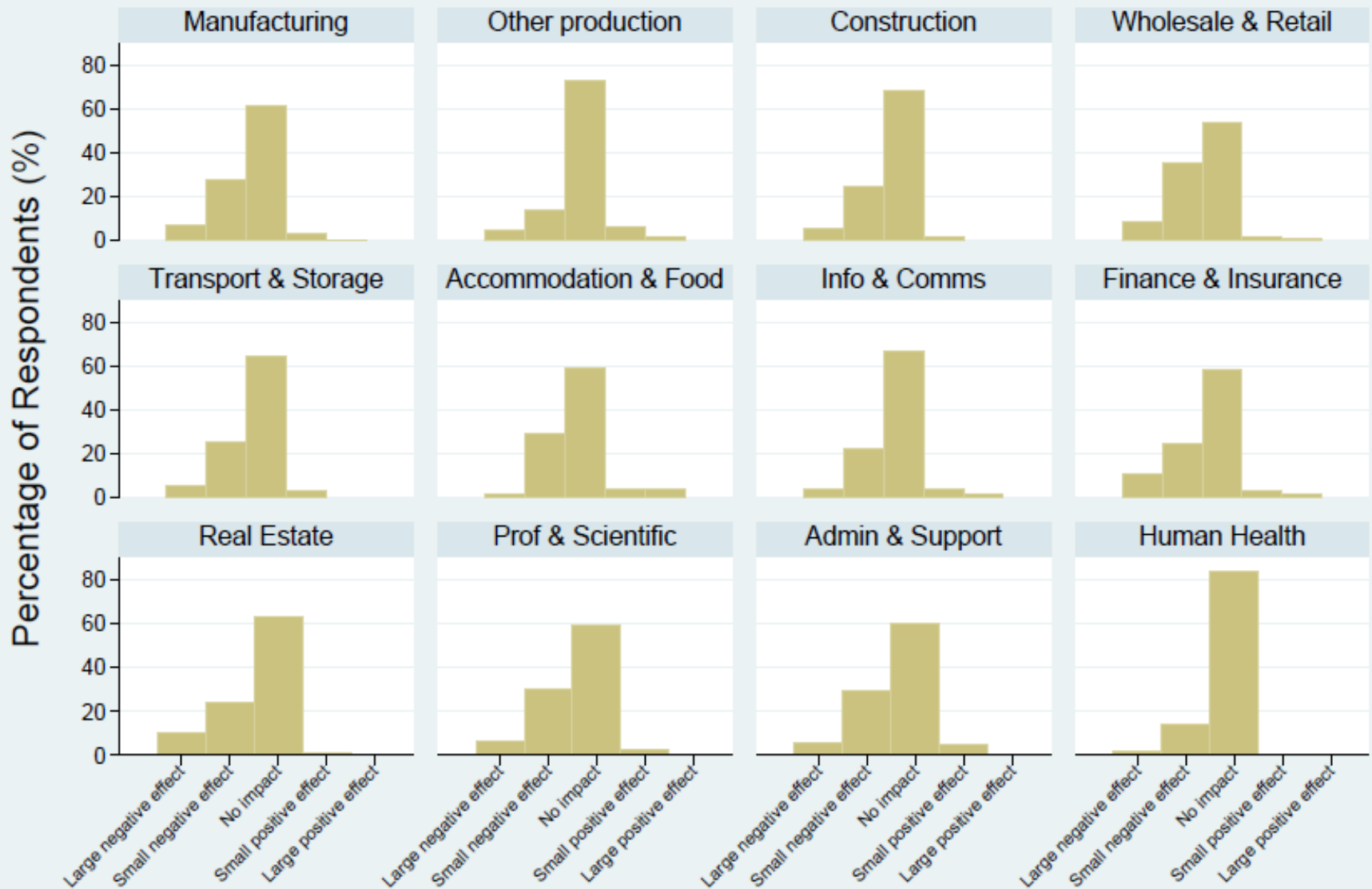
Policy Impact

What Other Evidence Can We Provide?

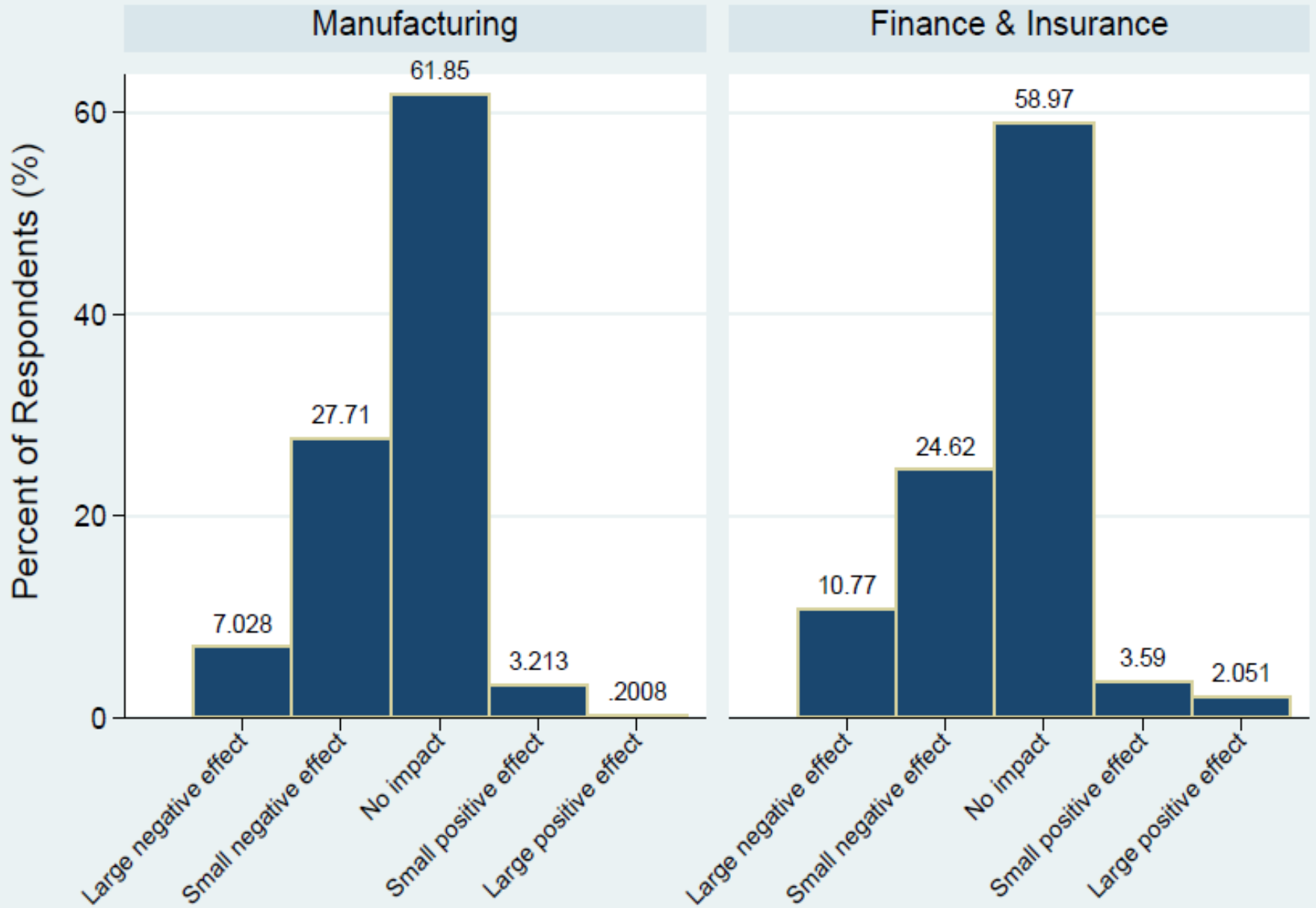
Disaggregated Data

- Disaggregated data can help pin down effects of shocks e.g. Brexit on industries and regions

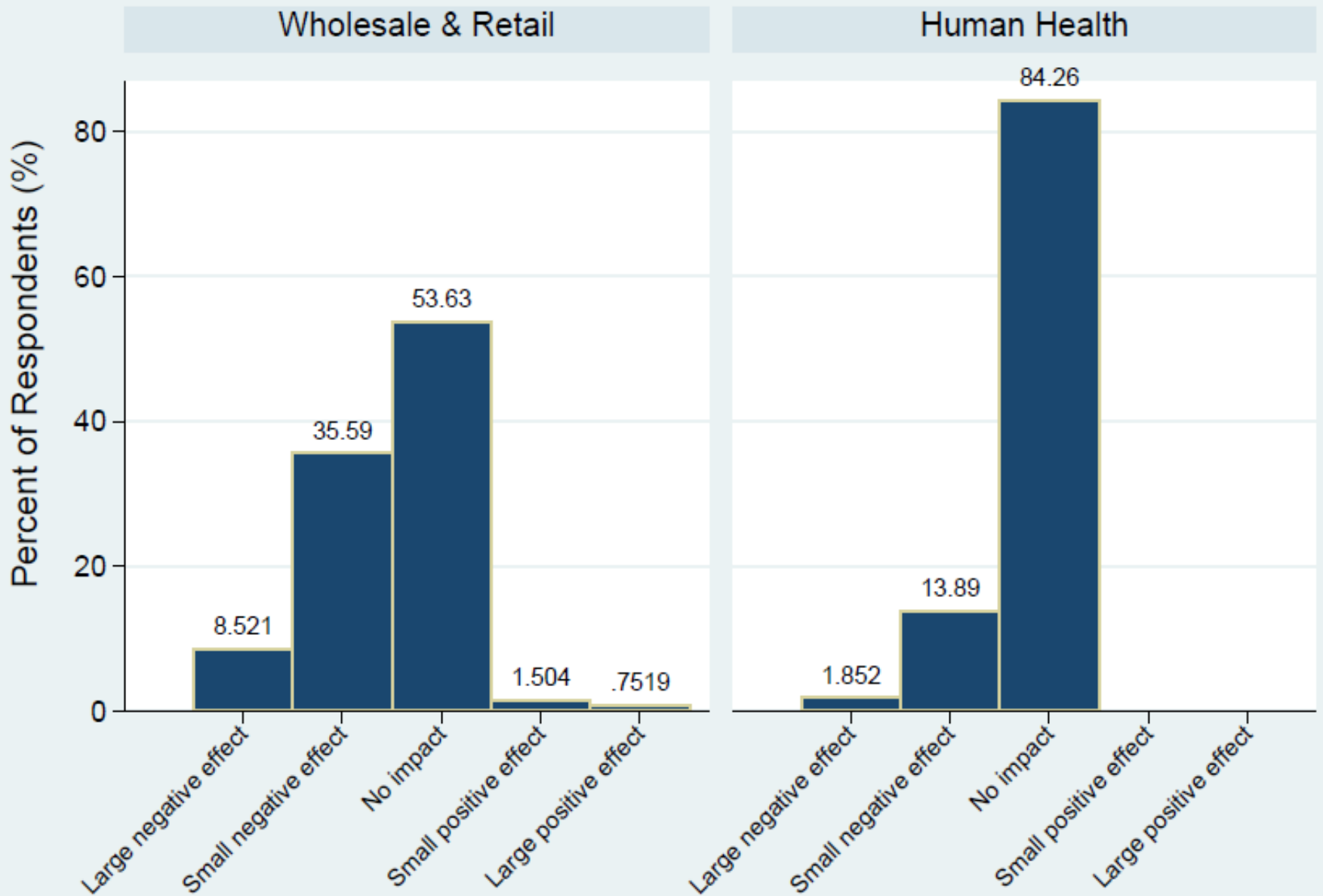
Expected Impact of Brexit on Sales (Aug - Oct 18)



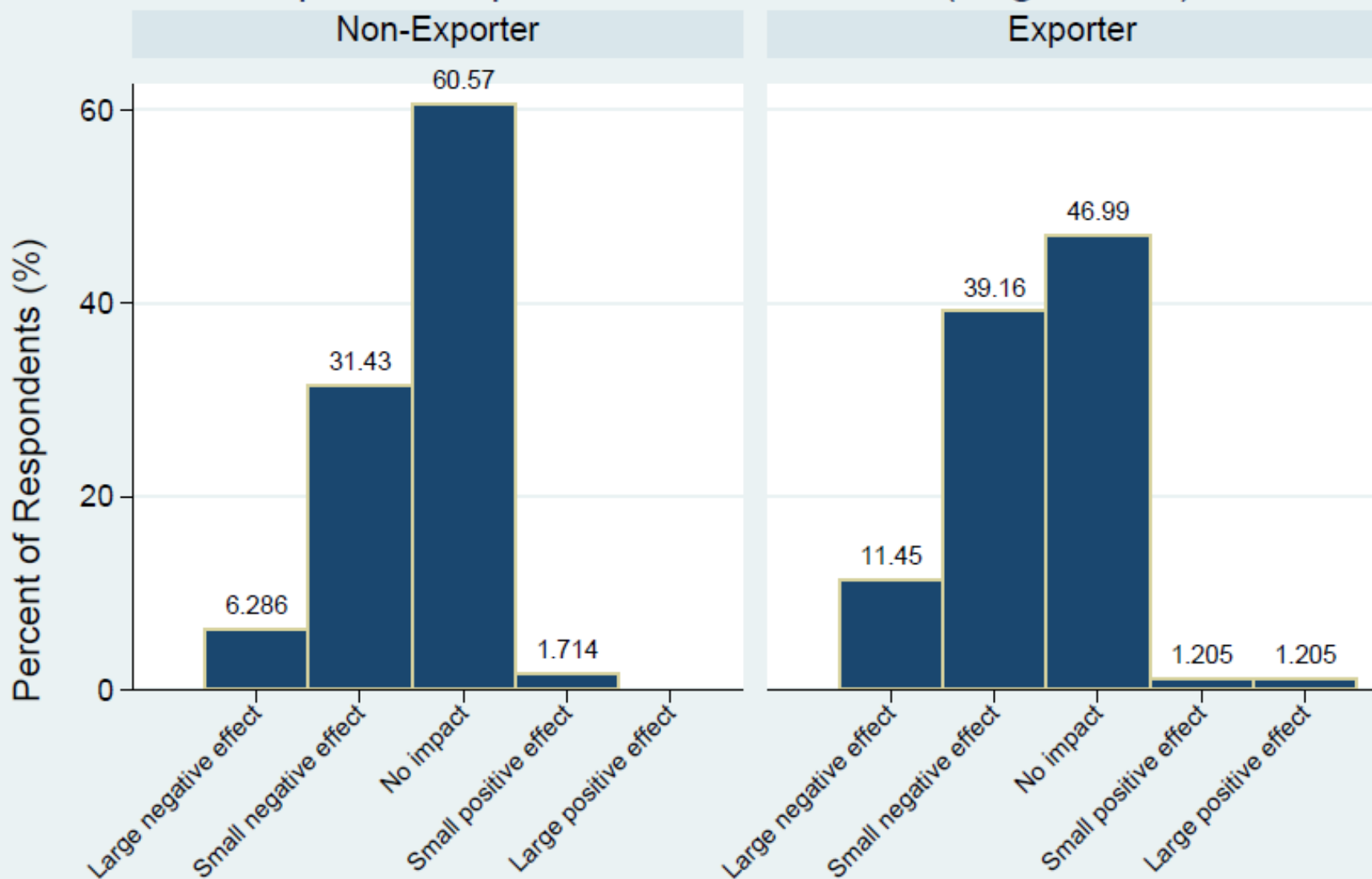
Expected Impact of Brexit on Sales (Aug-Oct 18)



Expected Impact of Brexit on Sales (Aug-Oct 18)



Expected Impact of Brexit on Sales (Aug-Oct 18)



Wholesale & Retail

- Disaggregated data can help pin down the sources of problems by industries and regions e.g. low productivity
- Can be developed as a tool for understanding where to target industrial strategies
- Could be used to evaluate the effects of interventions e.g. effectiveness via RCTs.

Analysis

- Can we use to understand the drivers of Brexit uncertainty in survey responses
- Can evaluate the effects of uncertainty on investment, employment and productivity

We explain which firms are most uncertain about Brexit

Dependent variable: Brexit uncertainty (4 point scale)	(1)	(2)	(3)	(4)	(5)
Share of sales to EU	0.010*** (0.002)				0.006** (0.002)
Share of sales to non-EU	-0.003* (0.002)				-0.004** (0.002)
Share of costs from EU imports		0.008*** (0.002)			0.007*** (0.002)
Share of costs from non-EU-imports		0.005*** (0.002)			0.004*** (0.002)
EU migrants 1-5% workforce (dummy)			0.207*** (0.064)		0.178*** (0.062)
EU migrant 6-10% workforce (dummy)			0.339*** (0.083)		0.291*** (0.083)
EU migrants 11-20% workforce (dummy)			0.286*** (0.090)		0.243*** (0.089)
EU migrants > 20% workforce (dummy)			0.547*** (0.108)		0.456*** (0.110)
Foreign owned (dummy)				0.173* (0.092)	0.041 (0.094)
Industry dummies	Yes	Yes	Yes	Yes	Yes
Observations	1,213	1,213	1,213	1,213	1,213
R-squared	0.218	0.233	0.225	0.198	0.265

Notes: Robust standard errors in parentheses. Dependent variable is defined as average uncertainty per firm in the two years after the referendum. *** p<0.01, ** p<0.05, * p<0.1.

Explain uncertainty effects on employment...

Dependent variable: Annual employment growth	(1)	(2)	(3)
Uncertainty*Year 1 after referendum	-0.732* (0.445)		
Uncertainty*Year 2 after referendum	-1.099*** (0.367)		
Uncertainty*Post referendum		-0.960*** (0.340)	
Predicted uncertainty*Year 1 after referendum			-0.546 (0.998)
Predicted uncertainty*Year 2 after referendum			-1.327* (0.780)
Year dummies	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes
Observations	12,602	12,602	12,602
R-squared	0.281	0.281	0.281

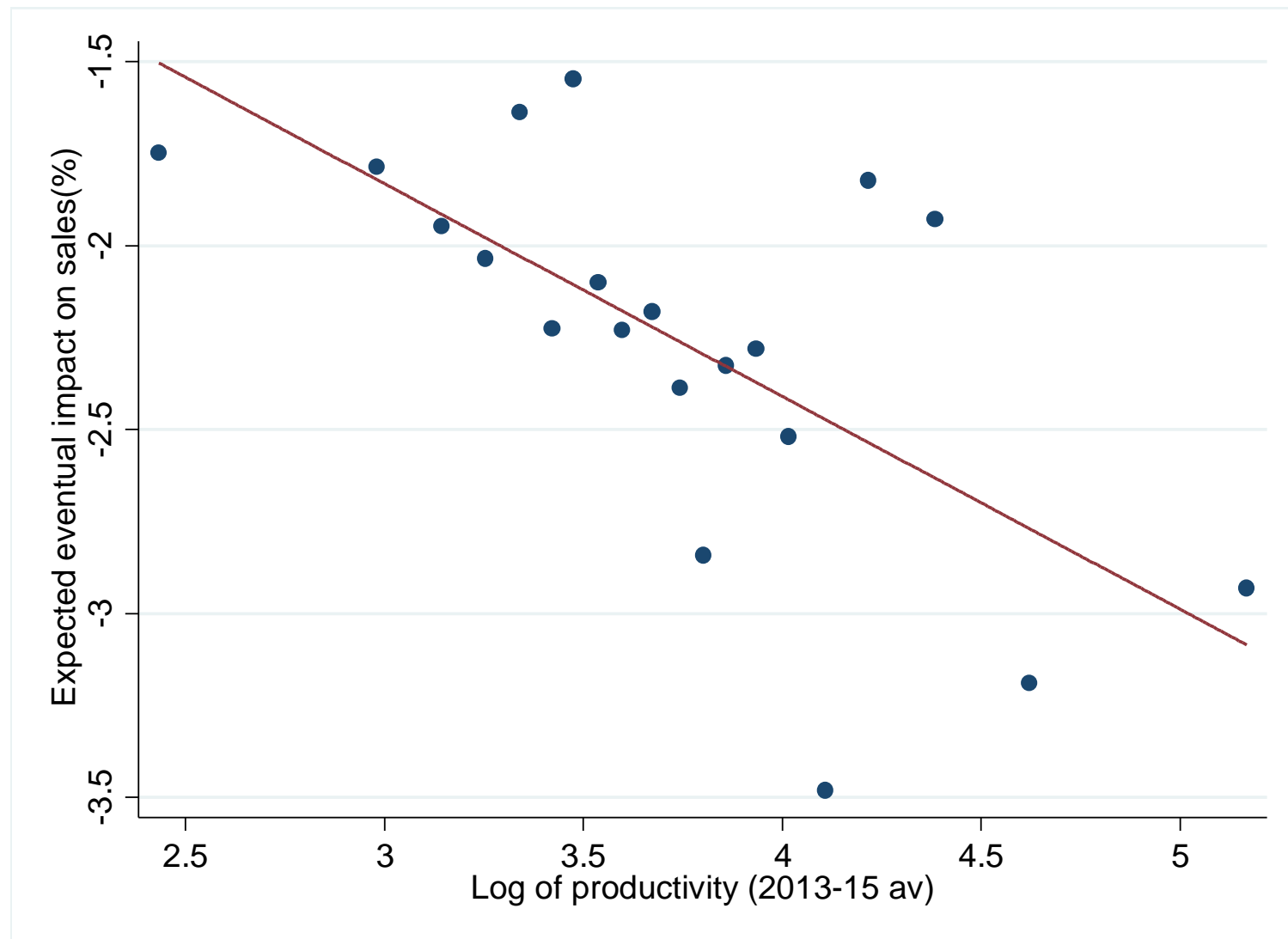
Notes: Post Brexit data from Decision Maker Panel combined with pre-Brexit data from company accounts. All regressions include a data source dummy and are estimated from 2011 onwards (years are defined from Q3 to Q2 in next calendar year). Post Brexit defined as 2016 Q3 onwards. Standard errors are clustered by firm. *** p<0.01, ** p<0.05, * p<0.1.

And on investment...

Dependent variable: Annual investment growth	(1)	(2)	(3)
Uncertainty*Year 1 after referendum	-4.629** (2.154)		
Uncertainty*Year 2 after referendum	-0.739 (2.105)		
Uncertainty*Post referendum		-2.675 (1.723)	
Predicted uncertainty*Year 1 after referendum			-7.802* (4.698)
Predicted uncertainty*Year 2 after referendum			1.704 (4.719)
Year dummies	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes
Observations	6,676	6,676	6,676
R-squared	0.237	0.236	0.236

Notes: Post Brexit data from Decision Maker Panel combined with pre-Brexit data from company accounts. All regressions include a data source dummy and are estimated from 2011 onwards (years are defined from Q3 to Q2 in next calendar year). Post Brexit defined as 2016 Q3 onwards. Standard errors are clustered by firm. Only firms with an investment growth rate between -100% and +100% are included. DHS growth rates are used. *** p<0.01, ** p<0.05, * p<0.1.

And Misallocation, since more productive firms perceive a greater Brexit effect on sales



So Brexit shrinks productive firms more

Dependent variable: Firms' expected eventual impact of Brexit on sales (%)	(1)	(2)	(3)	(4)	(5)	(6)
Log of pre-referendum productivity	-0.553** (0.217)	-0.447** (0.220)	-0.463** (0.218)	-0.480** (0.211)	-0.523** (0.220)	-0.373* (0.217)
Share of sales to EU		-0.038*** (0.009)				-0.027*** (0.010)
Share of sales to non-EU		0.008 (0.007)				0.012* (0.007)
Share of costs from EU imports			-0.011 (0.007)			-0.005 (0.007)
Share of costs from non-EU imports			-0.016** (0.006)			-0.012* (0.006)
EU migrants 1-5% workforce (dummy)				-0.562* (0.287)		-0.468 (0.287)
EU migrant 6-10% workforce (dummy)				-1.643*** (0.367)		-1.476*** (0.368)
EU migrants 11-20% workforce (dummy)				-1.582*** (0.411)		-1.322*** (0.421)
EU migrants > 20% workforce (dummy)				-1.730*** (0.552)		-1.583*** (0.550)
Foreign owned (dummy)					-0.370 (0.369)	-0.104 (0.379)
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1000	1000	1000	1000	1000	1000
R-squared	0.074	0.093	0.084	0.105	0.075	0.121

Notes: Robust standard errors in parentheses. Dependent variable is defined as self reported average eventual impact of Brexit on sales per firm in the two years after the referendum. *** p<0.01, ** p<0.05, * p<0.1.

Estimate misallocation impact from Brexit at around -0.5% of TFP

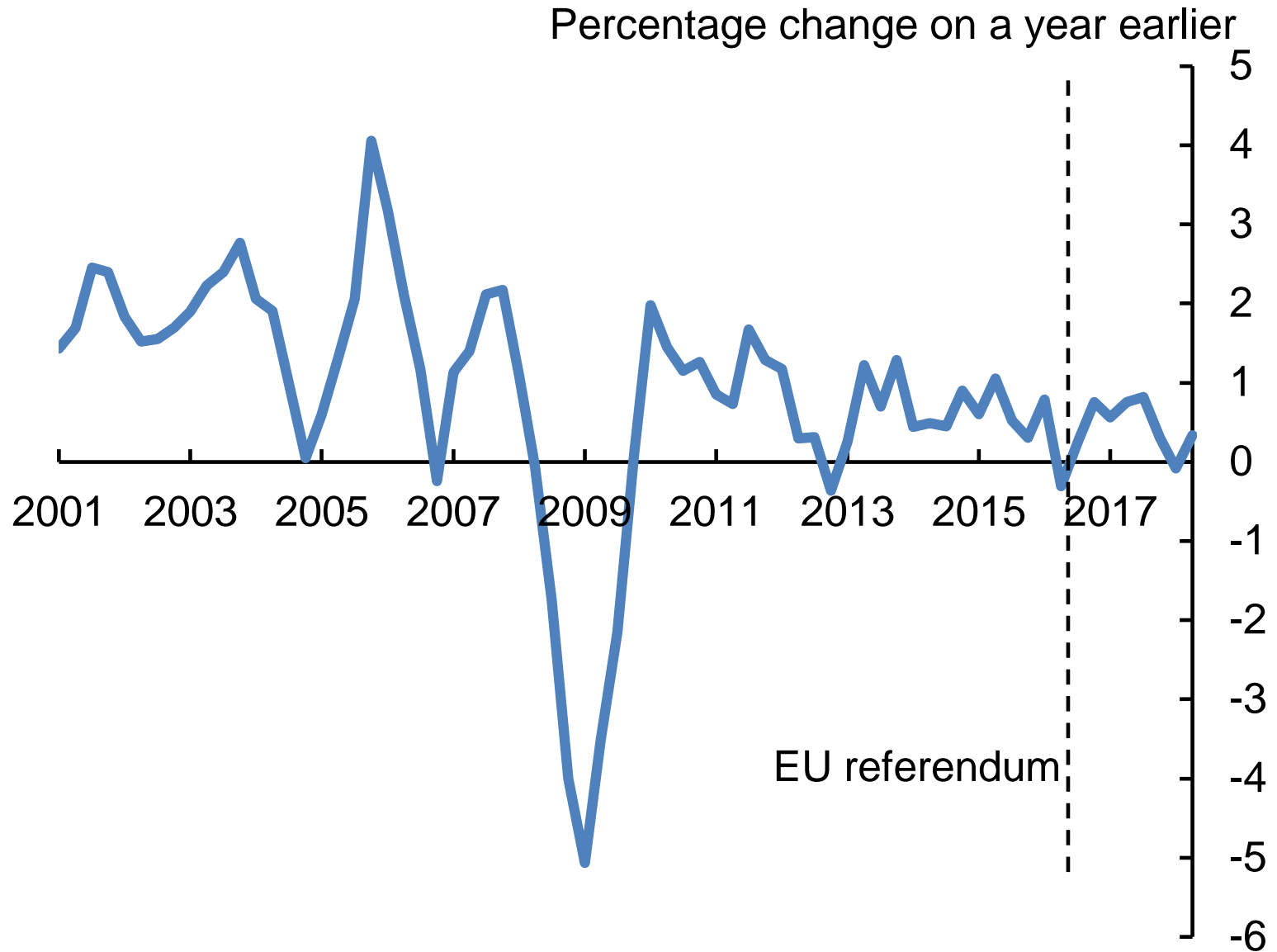
Aggregate productivity effect, weighted by sales

Winsorize at:	Point estimate	95% Confidence Interval	
1 & 99 pct	-0.46%	-0.11%	-0.82%
2.5 & 97.5 pct	-0.40%	-0.09%	-0.70%

Method:

- Calculate difference in Brexit sales effect for each firm if high productivity firms are more affected versus counterfactual where they are not.
- Sales weight productivity with and without this adjustment
- Difference is an estimate of the misallocation effect

UK Productivity Growth Has Already Been Weak



Also likely negative within firm TFP impact - e.g. from wasted hours of senior management

Number of hours a week spent on preparing for Brexit (share)

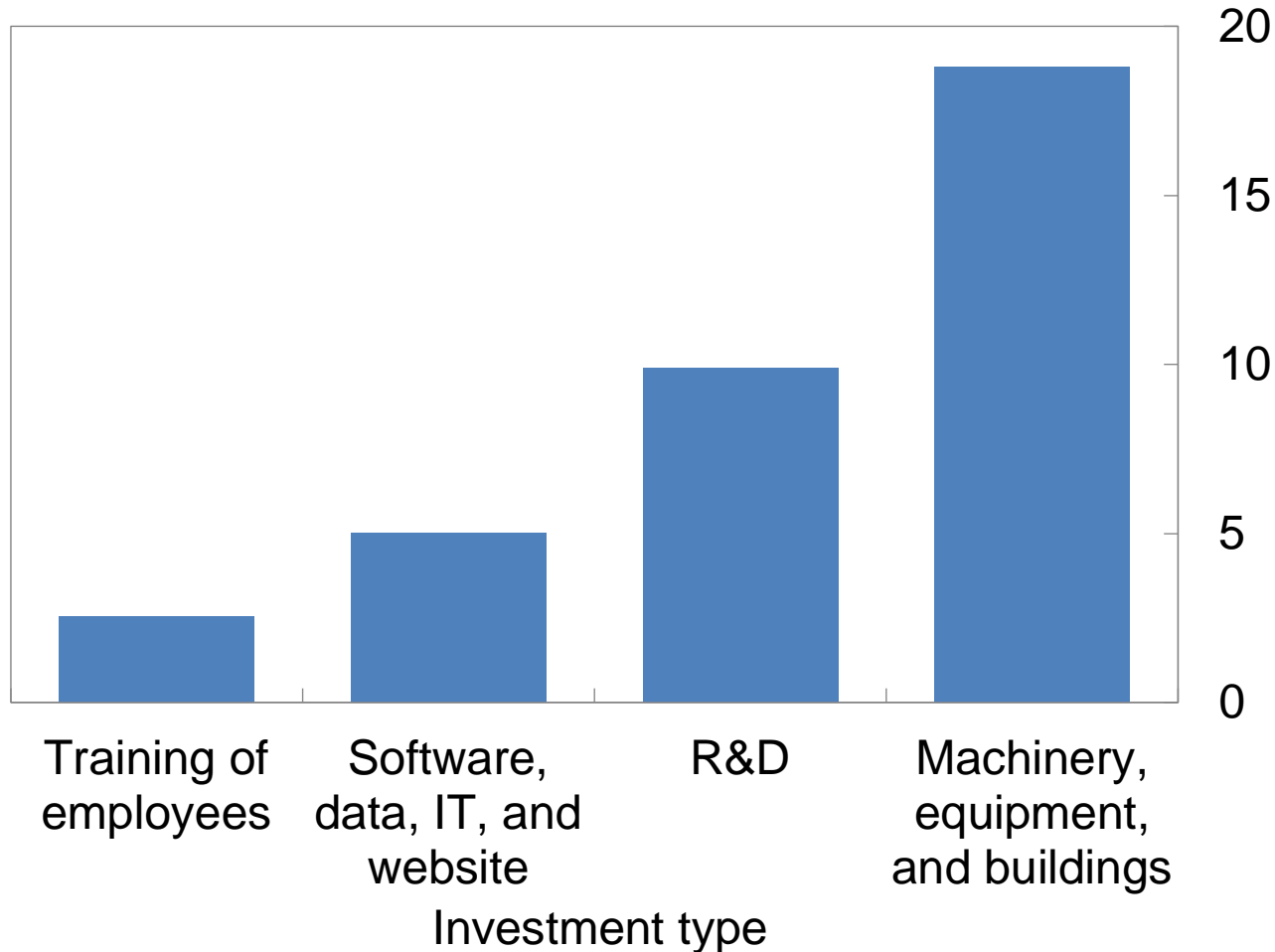
	CEO	CFO
None	41%	38%
Up to 1 hour	37%	39%
1 to 5 hours	14%	18%
6 to 10 hours	3%	3%
More than 10 hours	1%	1%
Don't know	4%	2%

Note: Growth in productivity has slowed to 0.45% a year since the referendum, compared to 0.7% between 2013 and 2015

Source: Decision Maker Panel. Data collected November 2017-January 2018.

Might also be a TFP effect if intangible investment (R&D and training) is reduced

Net balance of respondents who report having reduced investment due to Brexit (per cent)



Conclusions

The Decision Maker Panel has already been used to set policy in response to Brexit uncertainty :

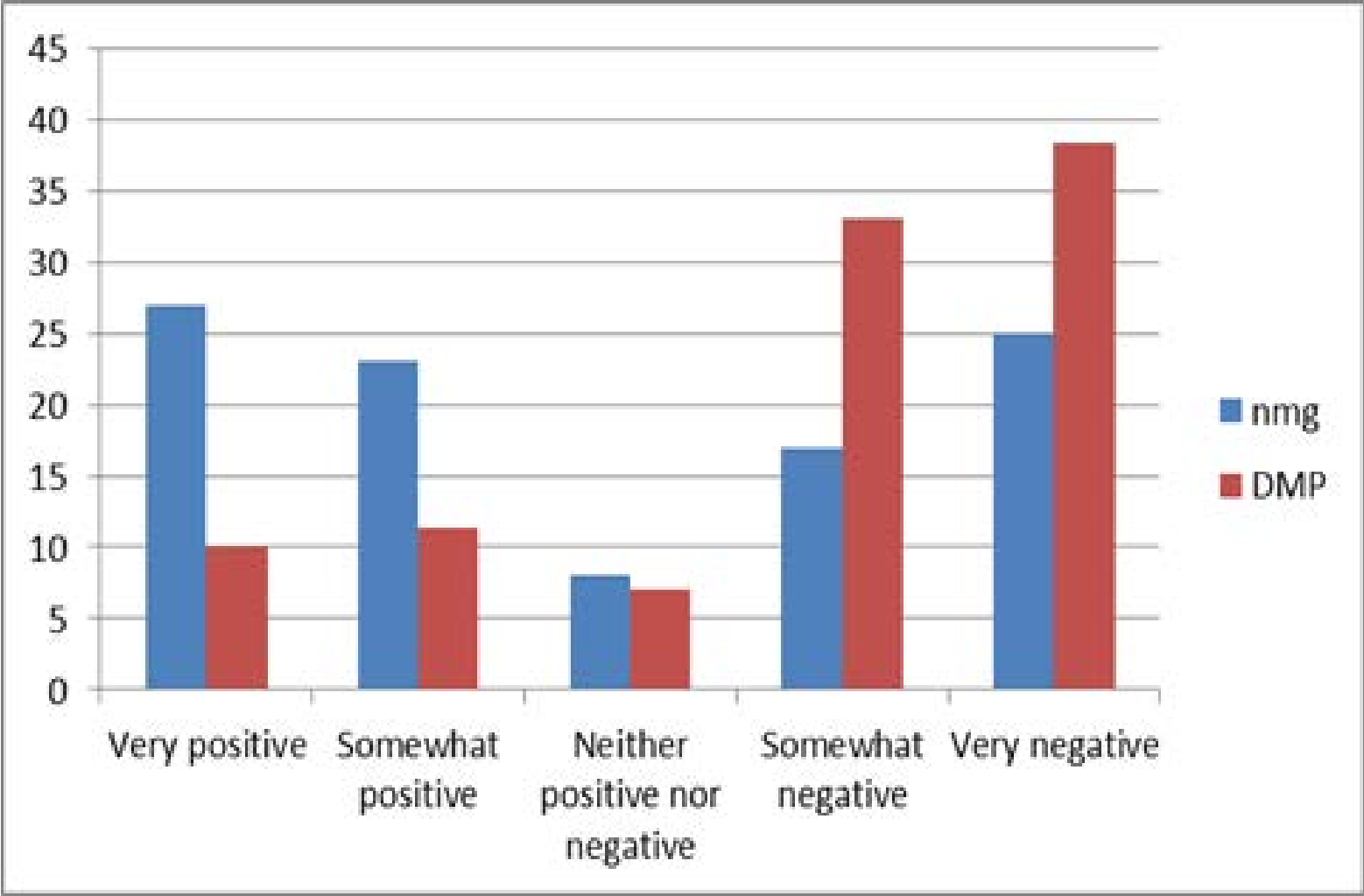
- Bank of England: Monetary Policy Committee decisions 2018
- HM Treasury: Budget 2018 Annual Investment Allowance

It will continue to be used at the Bank of England to evaluate the response of businesses to ongoing Brexit shocks.

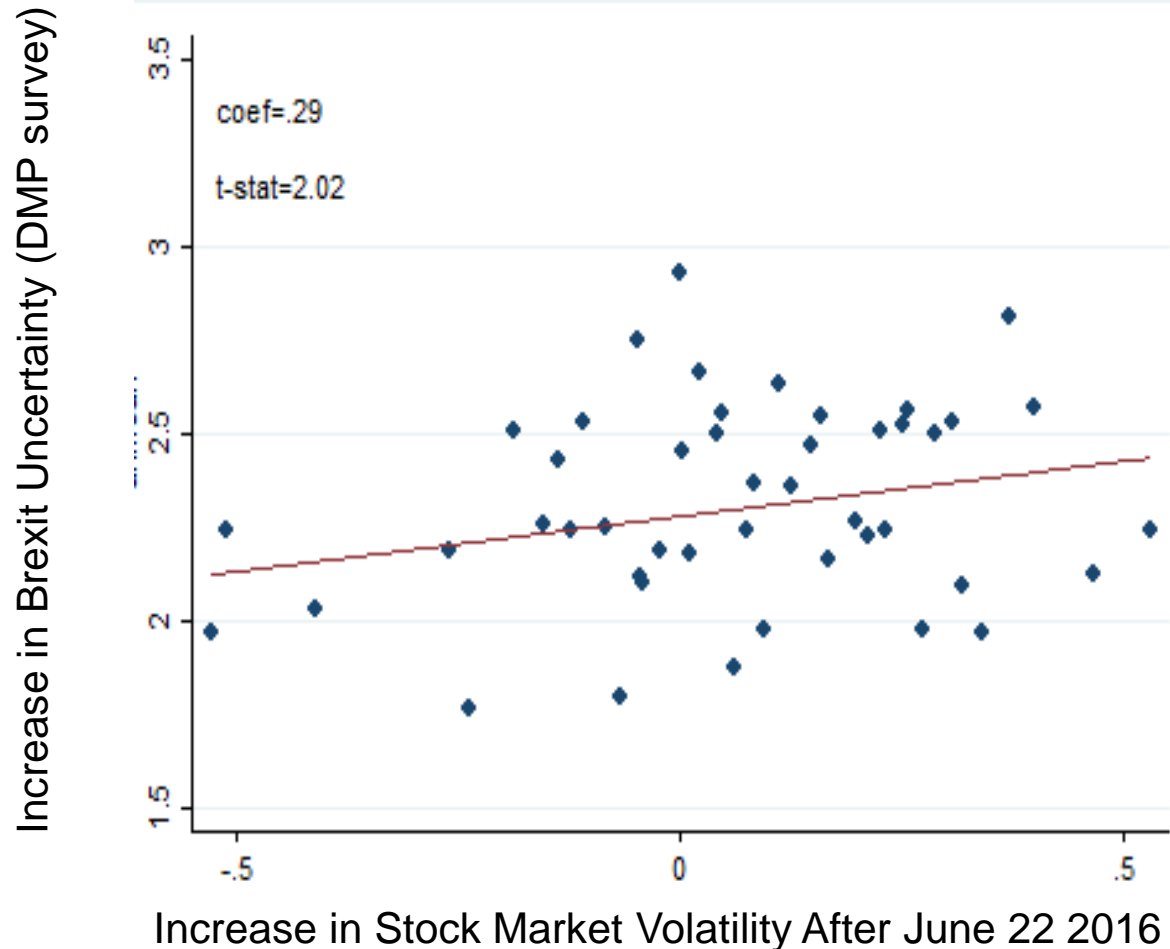
It is a tool that can be used to assess and target industrial strategies.

Additional Slides

Opinions: CFOs are more negative about Brexit than the population (but similar to managers in general survey)

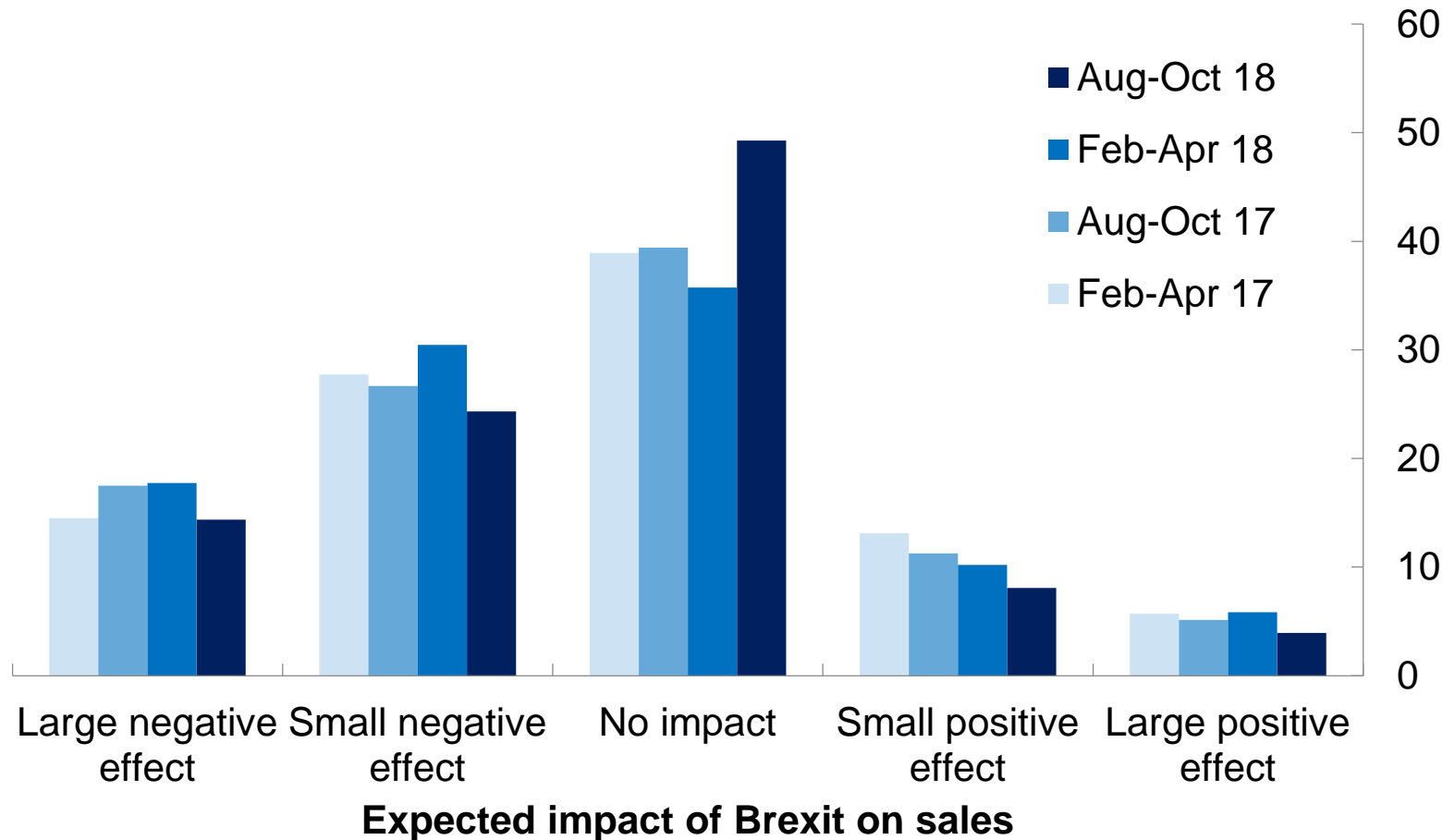


Brexit Uncertainty Measure is Correlated with Stock Market Volatility



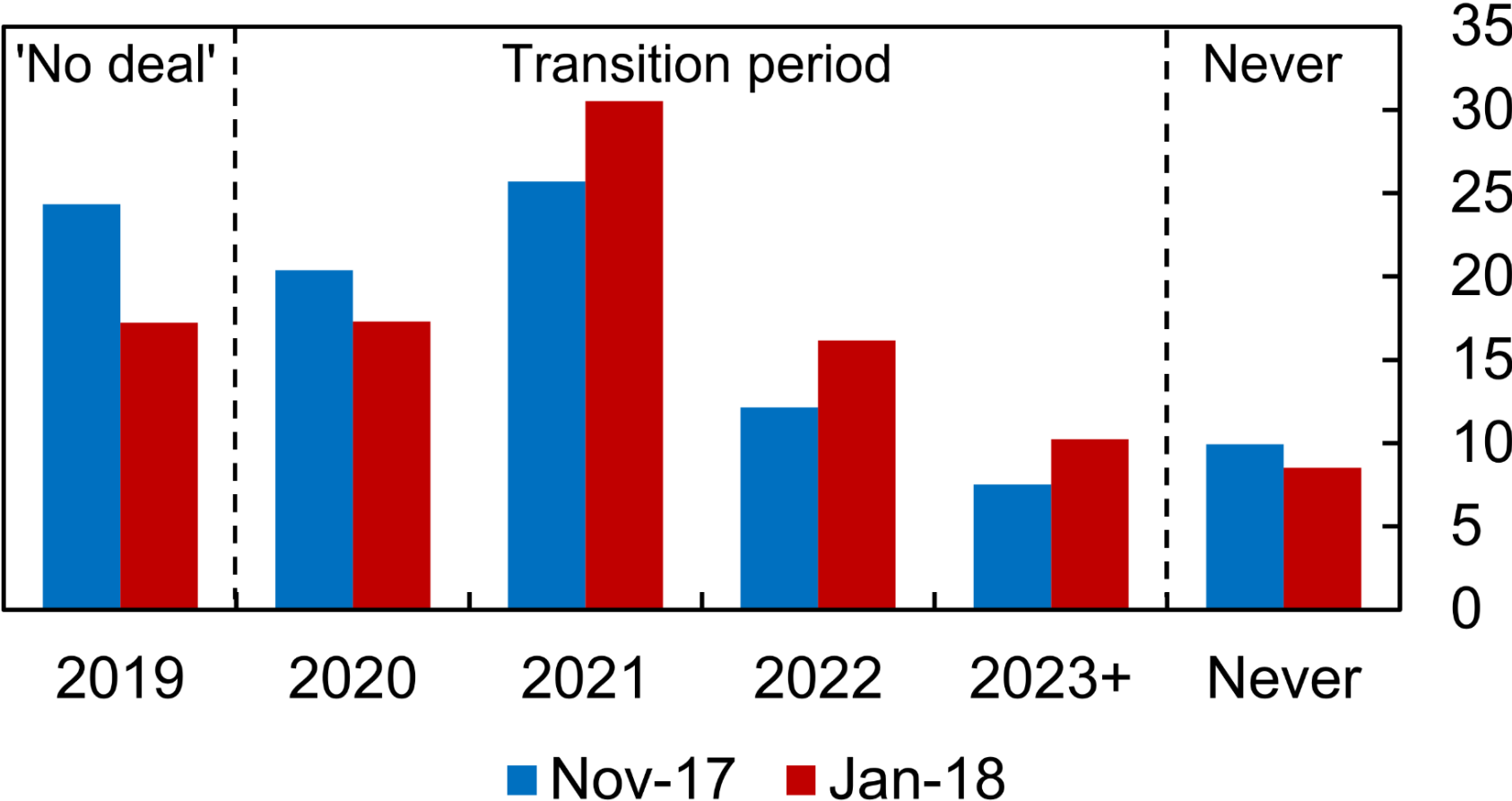
Notes: The graph plots firms' reported uncertainty against increase in stock market volatility at industry level. It is plotted using binscatter with 50 bins. Each dot in the underlying graph is a 3-digit UKSIC industry. For the uncertainty measure in DMP, we take the average of a firm's reported uncertainty among all waves, and then collapse to 3-digit UKSIC level by taking the mean of each industry. For the stock volatility measure, we use Compustat stock price data on all public listed firms in UK. We calculate the daily return, and then calculate the log of standard deviation in the 60 days right after Brexit and the 5 years before Brexit, and take the difference between the two (post minus pre). Then we winsorize this firm-level increase in stock volatility at 1 and 99 percentile, and collapse to 3-digit UKSIC level by taking the mean.

Expected impact of Brexit on sales



Uncertainty over what and how Brexit will happen

Average probability (per cent)



When do DMP members expect the UK to leave the EU?