

UK Trade in Goods and Productivity: New findings

Philip Wales, Russell Black, Ted Dolby, Gaganan Awano

ESCoE Workshop: What can we learn from Business Expectations Data?
26 November, 2018

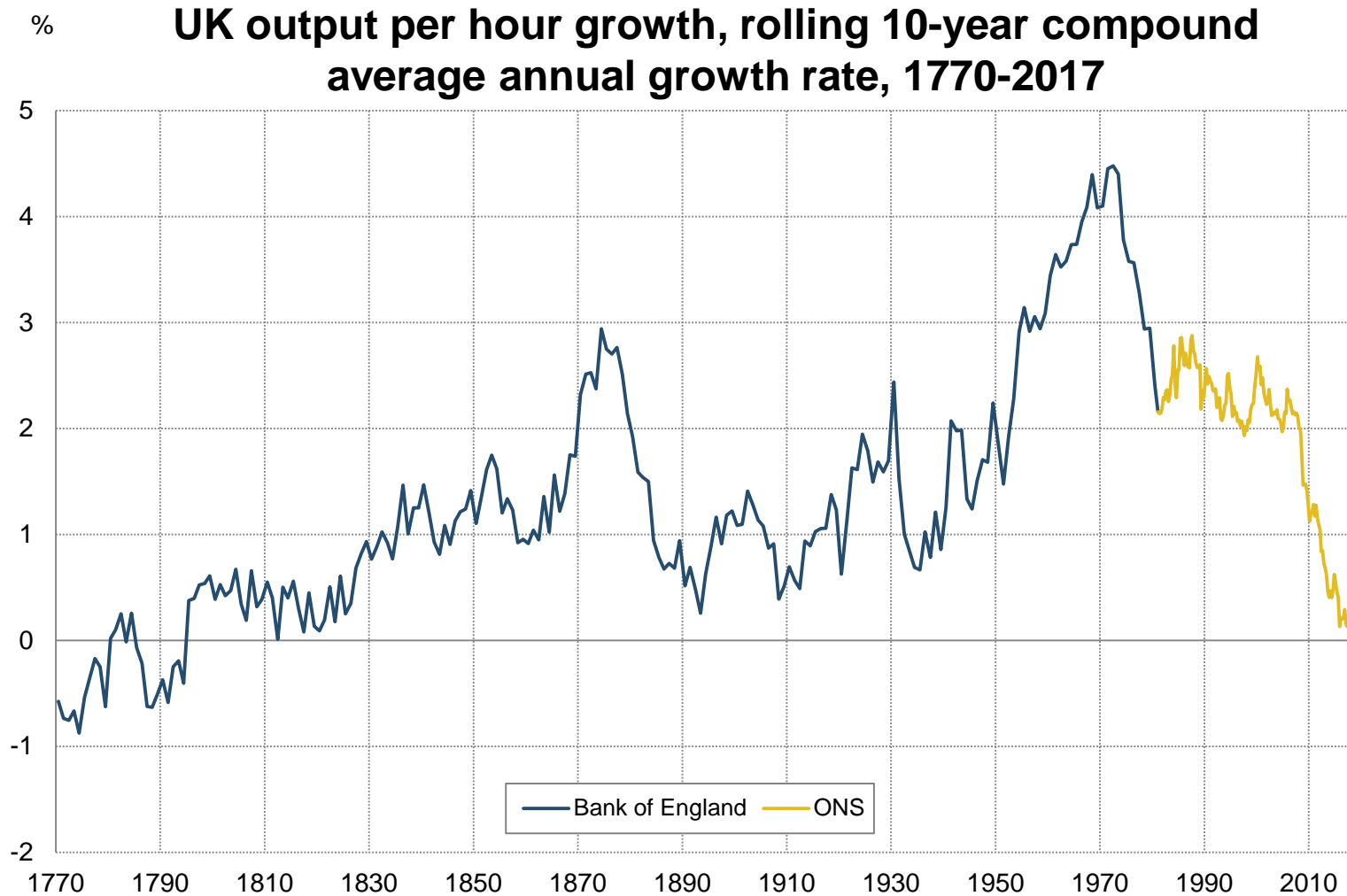
Outline

- 1. Motivation**
- 2. Data and Processing**
- 3. Results**
- 4. Next steps**

Motivation

- The UK's recent productivity performance has been strikingly weak – known as the 'Productivity Puzzle'

Motivation

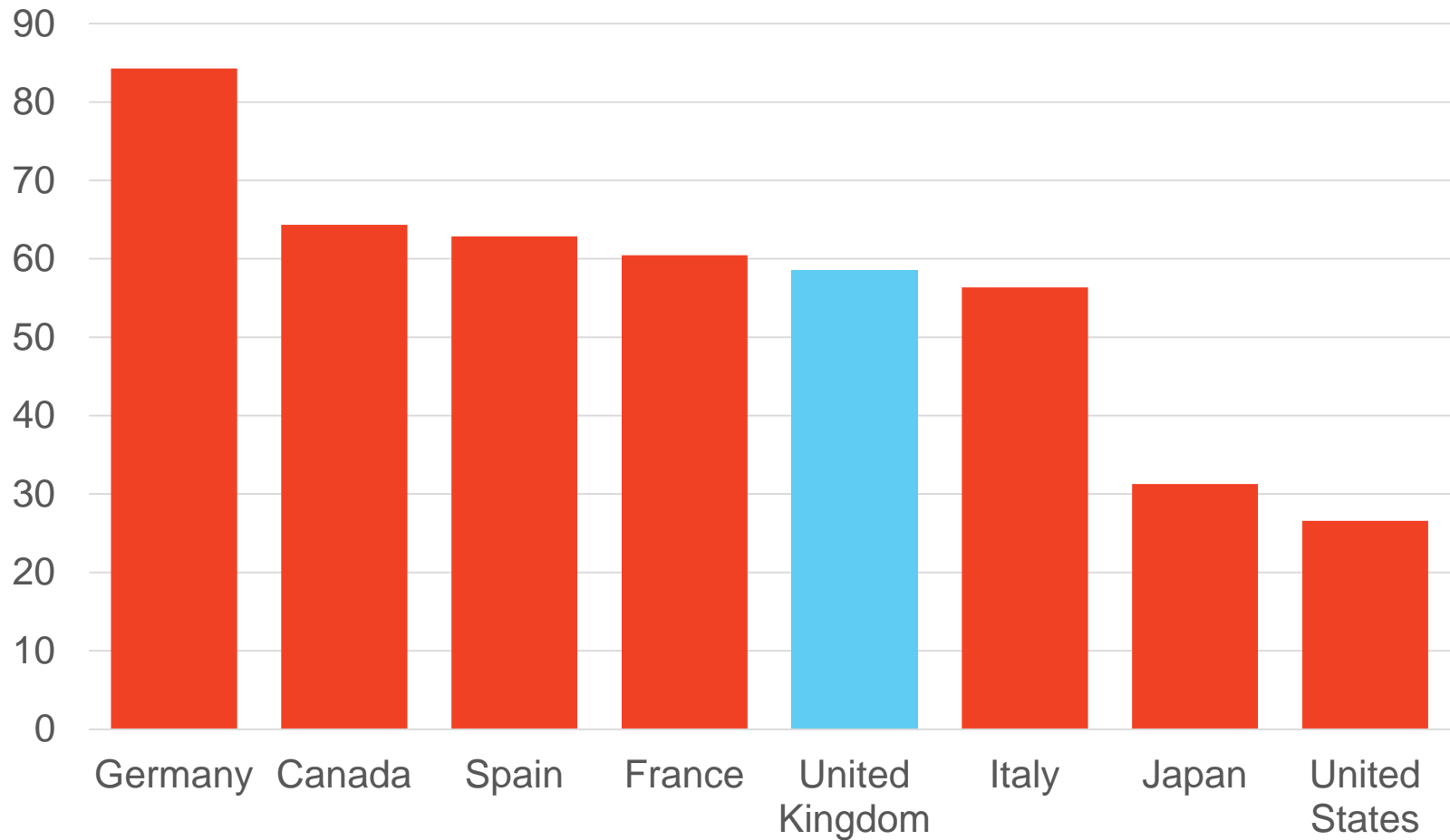


Motivation

- The UK's recent productivity performance has been strikingly weak – known as the 'Productivity Puzzle'
- The UK is a relatively open economy

Motivation

Total Imports + Exports % of GDP



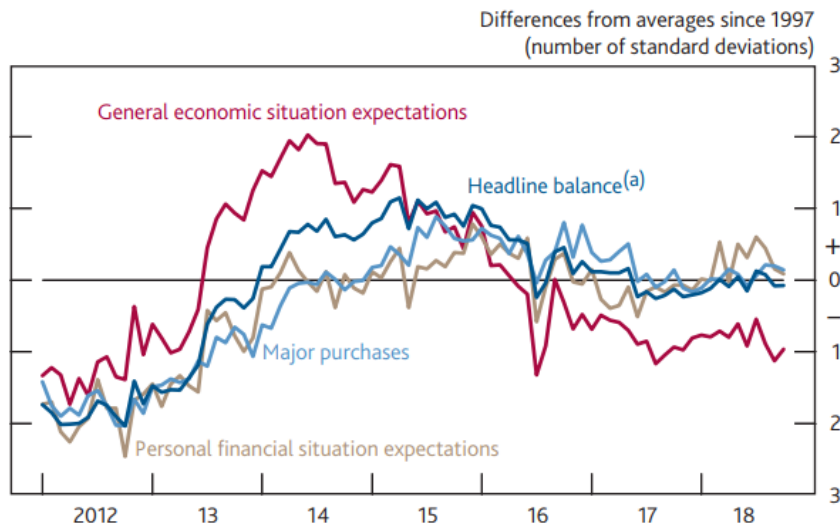
Motivation

- The UK's recent productivity performance has been strikingly weak – known as the 'Productivity Puzzle'
- The UK is a relatively open economy
- The UK's 2016 referendum on membership of the European Union is widely regarded as an uncertainty shock

Motivation

Chart 2.5 Households' confidence in their own finances has improved over the past year

Indicators of consumer confidence

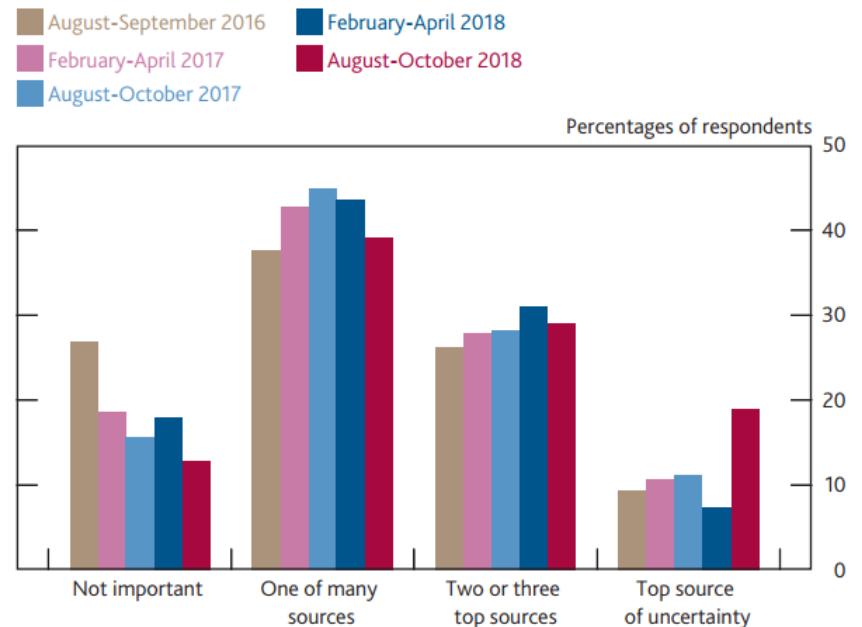


Sources: GfK (research carried out on behalf of the European Commission) and Bank calculations.

(a) Average of the net balances of respondents reporting that: their financial situation has got better over the past 12 months; their financial situation is expected to get better over the next 12 months; the general economic situation has got better over the past 12 months; the general economic situation is expected to get better over the next 12 months; and now is the right time to make major purchases, such as furniture or electrical goods.

Chart 2.11 Brexit-related uncertainty among companies has risen

Decision Maker Panel: Brexit as a source of uncertainty^(a)



(a) Responses to the question 'How much has the result of the EU referendum affected the level of uncertainty affecting your business?'.

Research aims

How are trade and productivity related at the firm level in the UK?

- *Which businesses trade? Who trades with the EU? With the non-EU?*
- *How concentrated is trade in goods?*
- *How are trader status and productivity related (the extensive margin)?*
- *How are trader intensity and productivity related (the intensive margin)?*
- *Do these productivity margins vary between EU/non-EU?*
- *How have changes in the prevalence of trade affected UK productivity growth over the last decade?*

How are trader status and business expectations and uncertainty related?

- *Were businesses which trade measurably more uncertain about their future prospects in the second half of 2017 than businesses which do not trade?*
- *How are measures of trade exposure and business expectations related?*

Empirical challenges

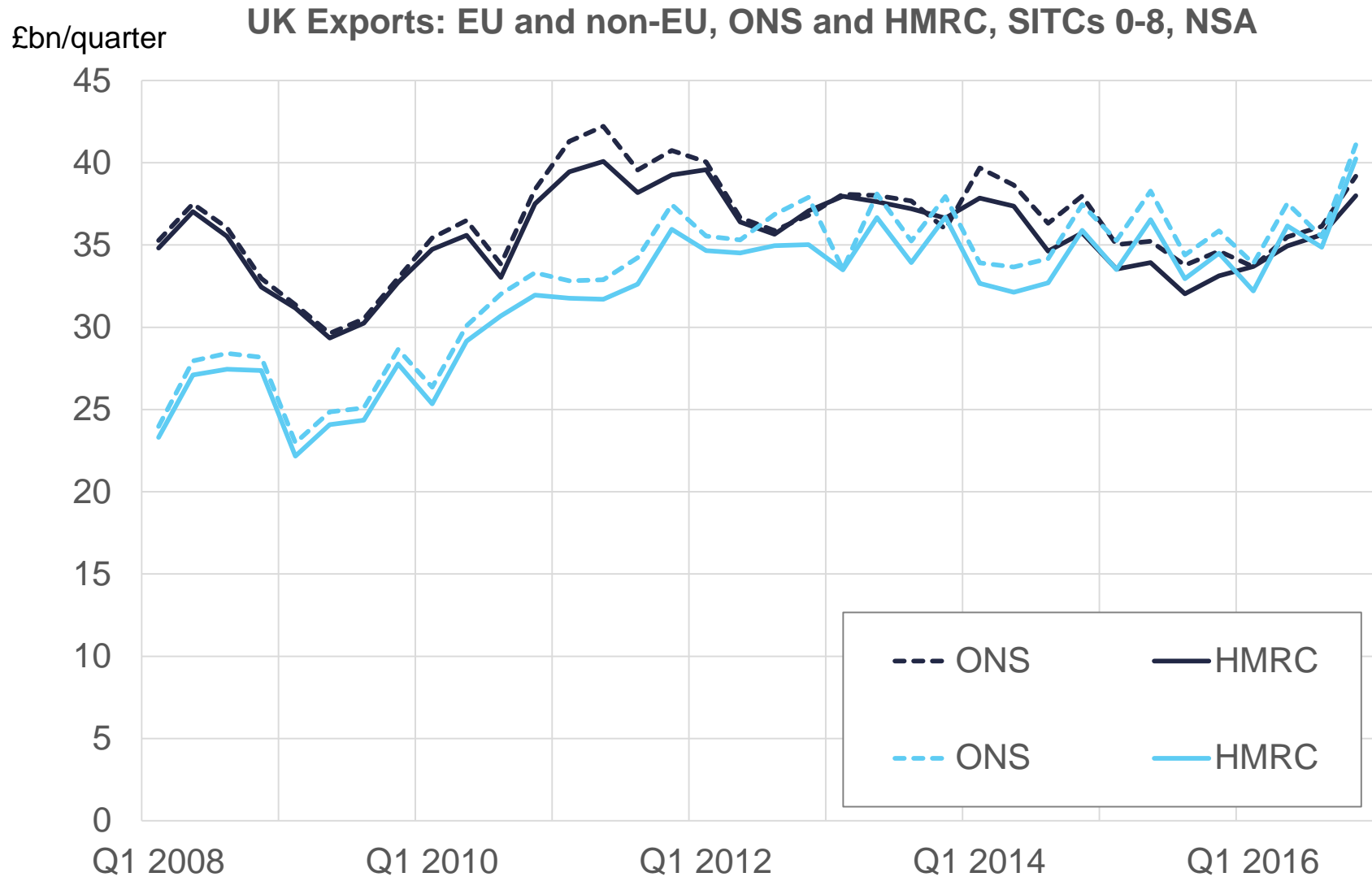
- **No single data collection in the UK which combines data on both trade in goods and productivity**
- **Data are collected by different organisations, for different corporate units**
- **Administrative and survey data challenges**

Data

HMRC Trade in goods transaction level dataset

- *Records of specific product shipments by UK businesses (2016: 30.6m records)*

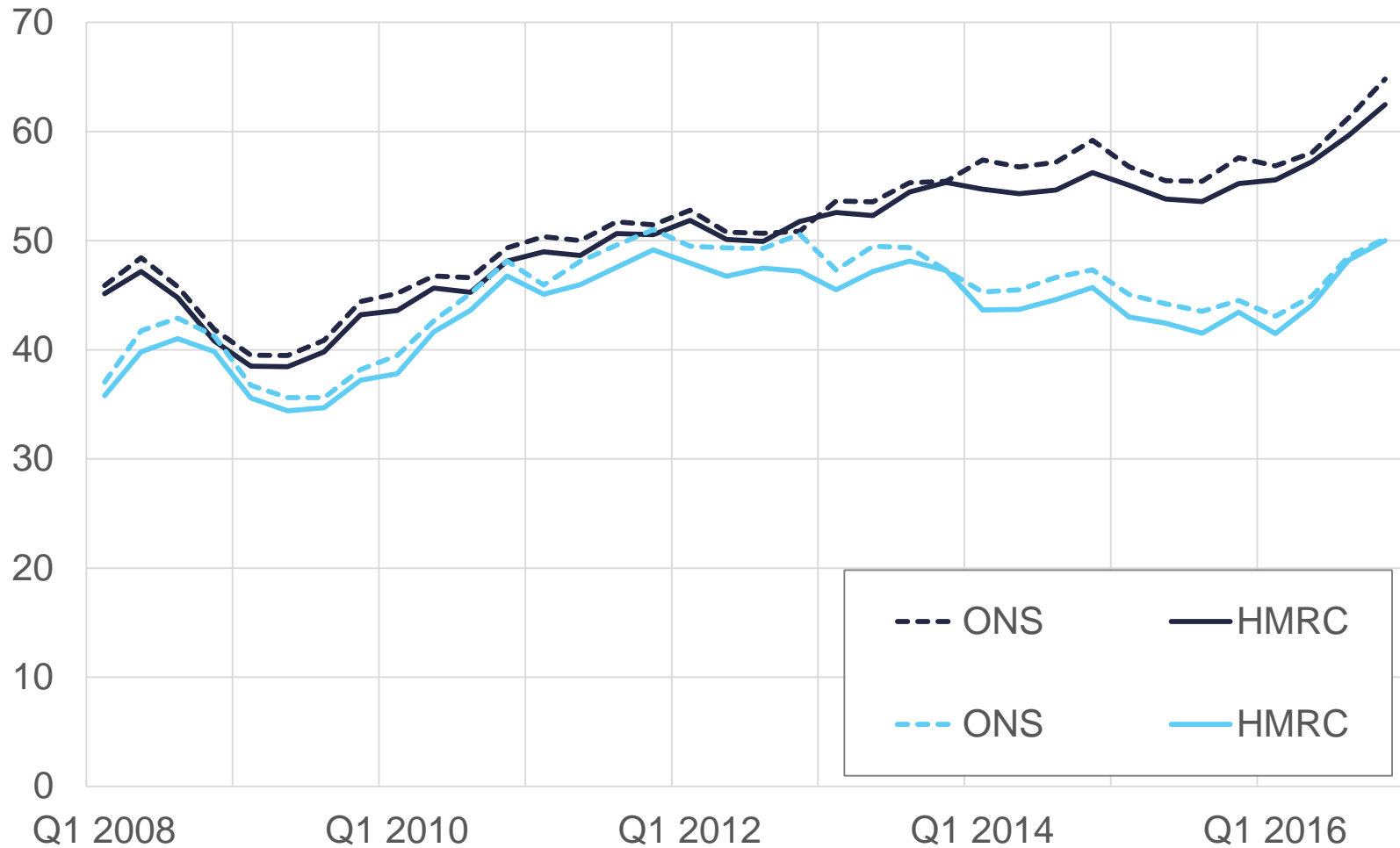
Data



Data

£bn/quarter

UK Imports: EU and non-EU, ONS and HMRC, SITCs 0-8, NSA



Data

HMRC Trade in goods transaction level dataset

- *Records of specific product shipments by UK businesses (2016: 30.6m records)*

Inter-Departmental Business Register (IDBR)

- *Records links between different corporate identifiers (VAT, CRN, RU, etc)*

Data

HMRC Trade in goods transaction level dataset

- *Records of specific product shipments by UK businesses (2016: 30.6m records)*

Inter-Departmental Business Register (IDBR)

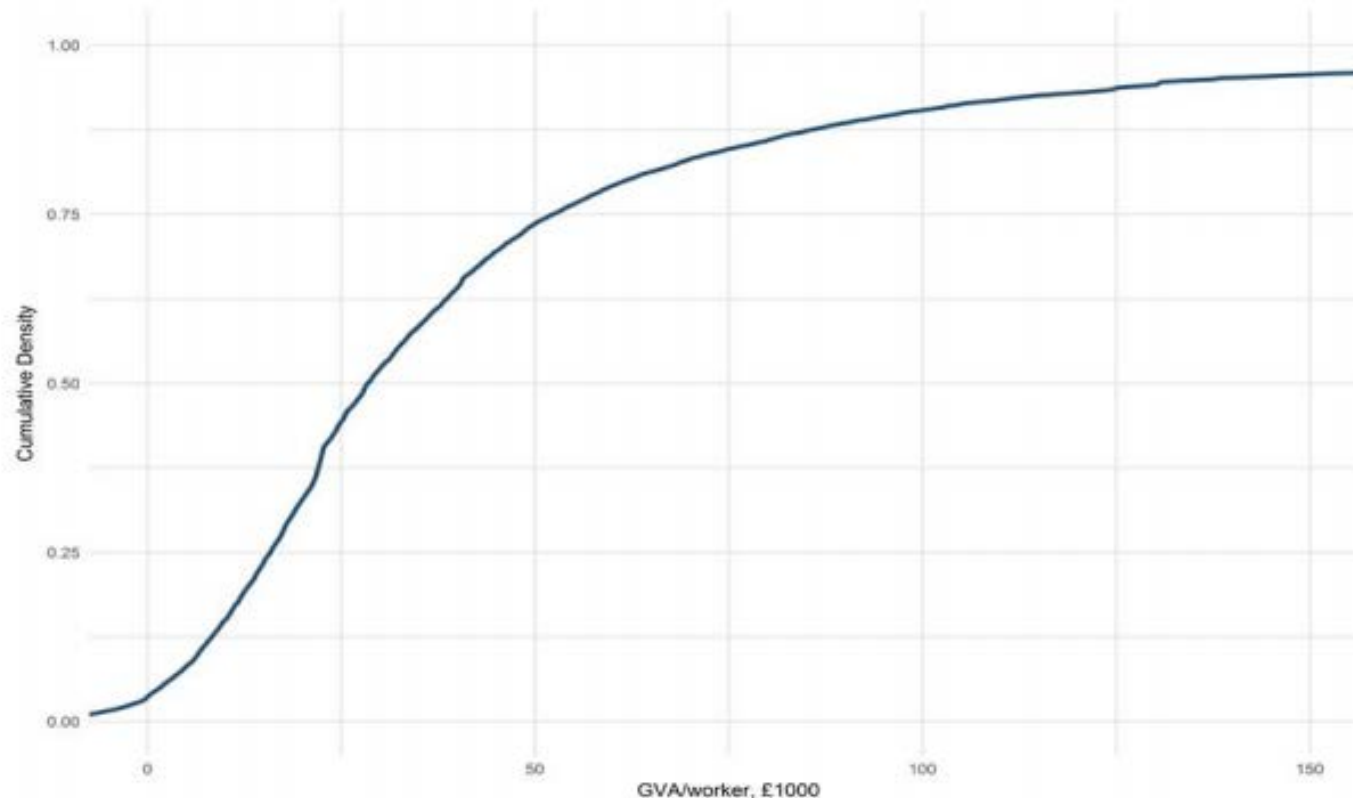
- *Records links between different corporate identifiers (VAT, CRN, RU, etc)*

Annual Business Survey (ABS)

- *Survey of businesses, including information to calculate productivity*

Data

Figure 1: Distribution of labour productivity across businesses, Great Britain, 2016



Source(s): ONS

Note(s): (1) Approximate Gross Value Added (aGVA) per worker from the Annual Business Survey. (2) Excludes businesses which report zero turnover for 2016. (3) Weighted by sample and grossing weights as well as employment: Consequently the cumulative density function aggregates over employment, as well as businesses.

Data

HMRC Trade in goods transaction level dataset

- *Records of specific product shipments by UK businesses (2016: 30.6m records)*

Inter-Departmental Business Register (IDBR)

- *Records links between different corporate identifiers (VAT, CRN, RU, etc)*

Annual Business Survey (ABS)

- *Survey of businesses, including information to calculate productivity*

Management and Expectations Survey (MES)

- *Survey of businesses in GB, gathering probability weighted forecasts*

Data

HMRC transaction level dataset



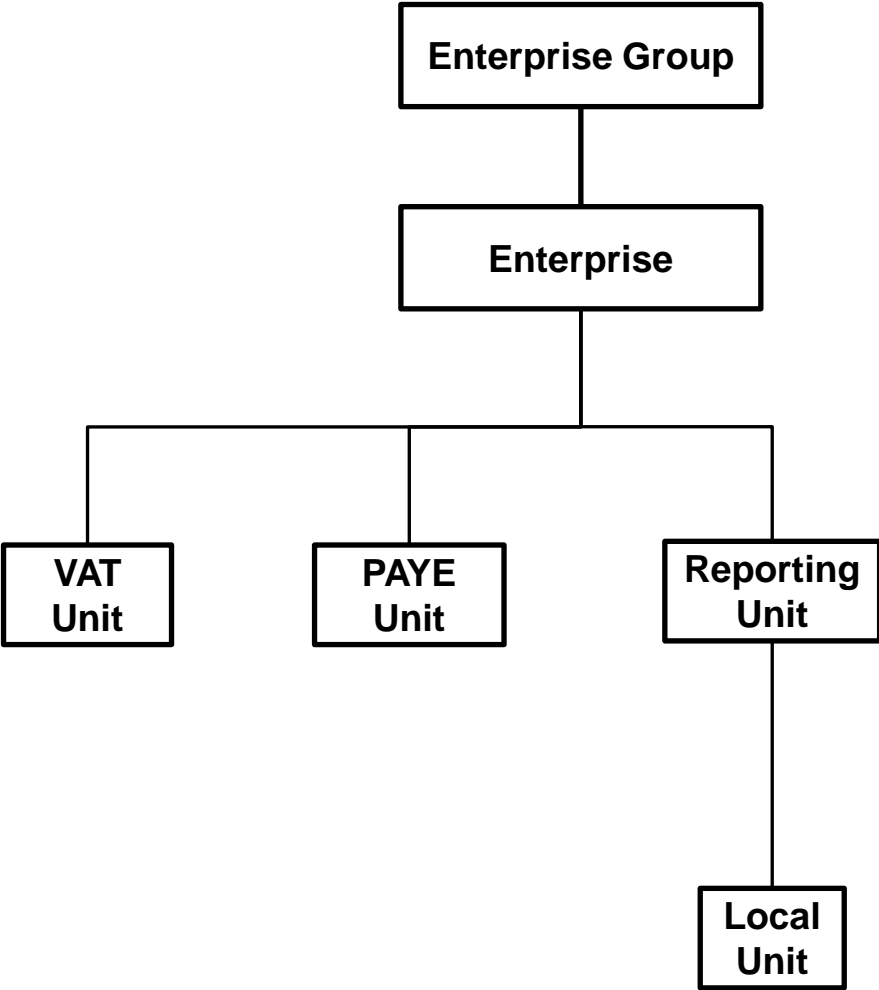
IDBR



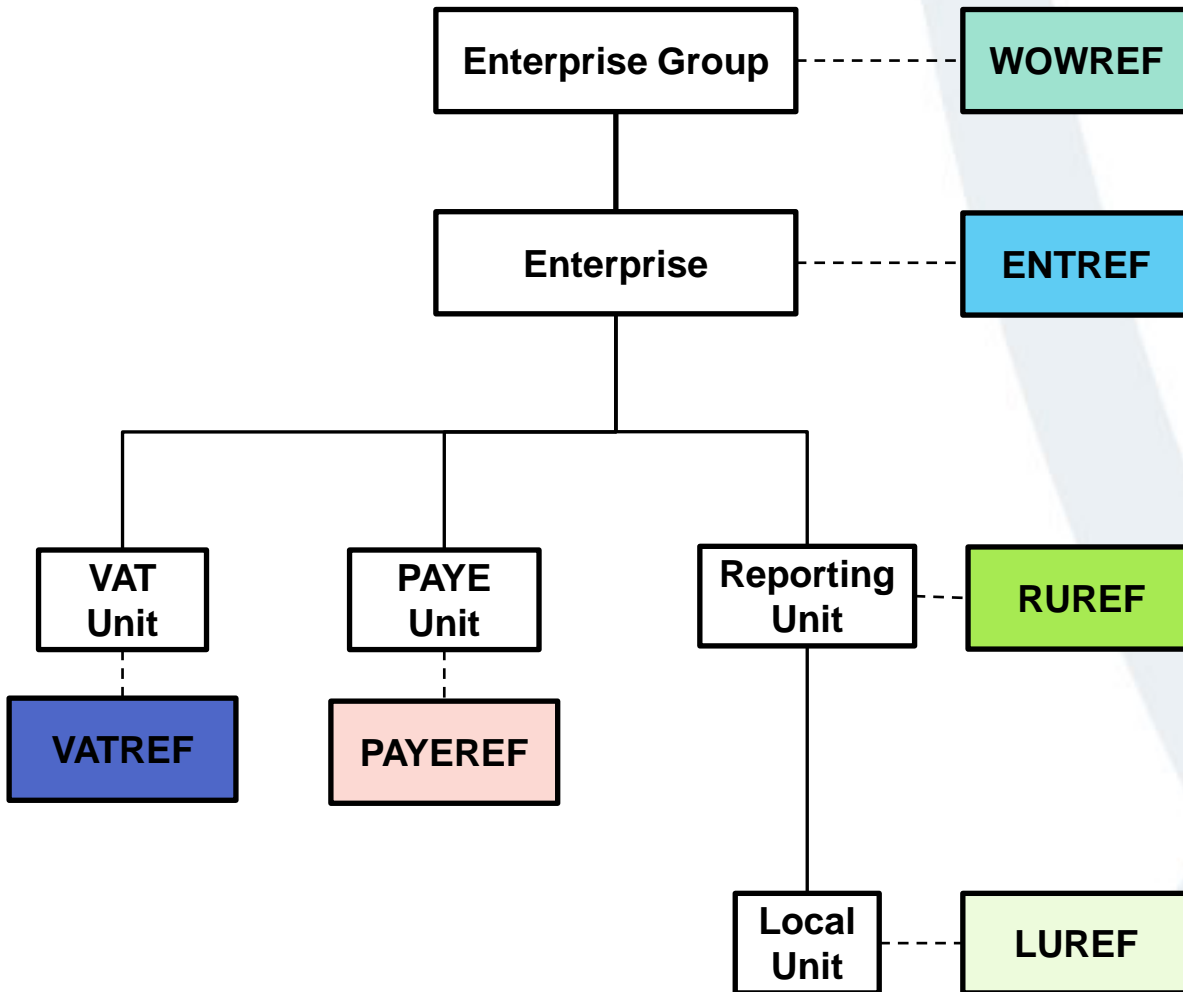
ABS

MES

IDBR Structure



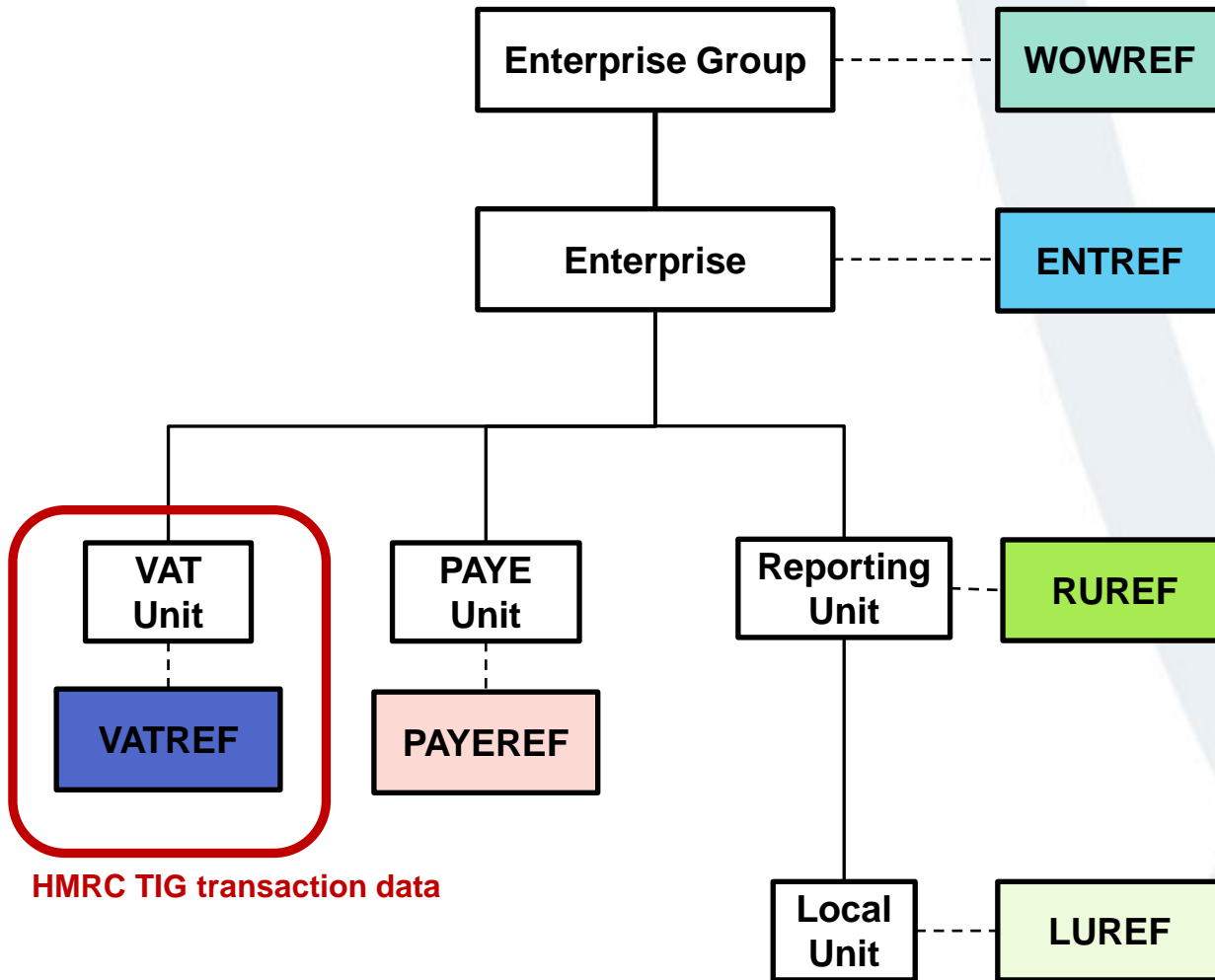
IDBR Structure



Methods

- The transactions data to which we have access is for VAT units...

IDBR Structure

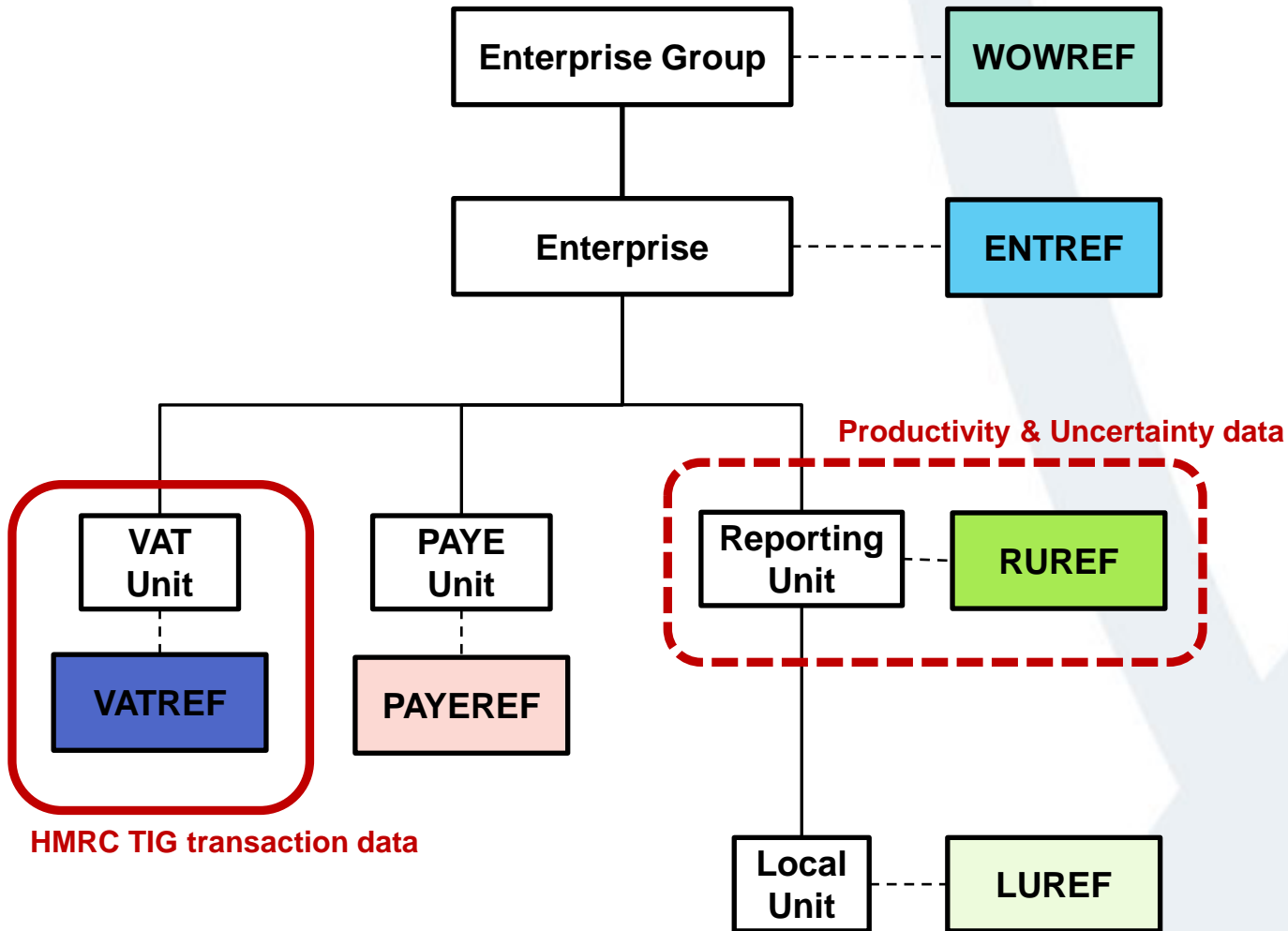


HMRC TIG transaction data

Methods

- The transactions data to which we have access is for VAT units...
- ...However, the estimates of productivity and uncertainty that we hold are on a Reporting Unit basis...

IDBR Structure



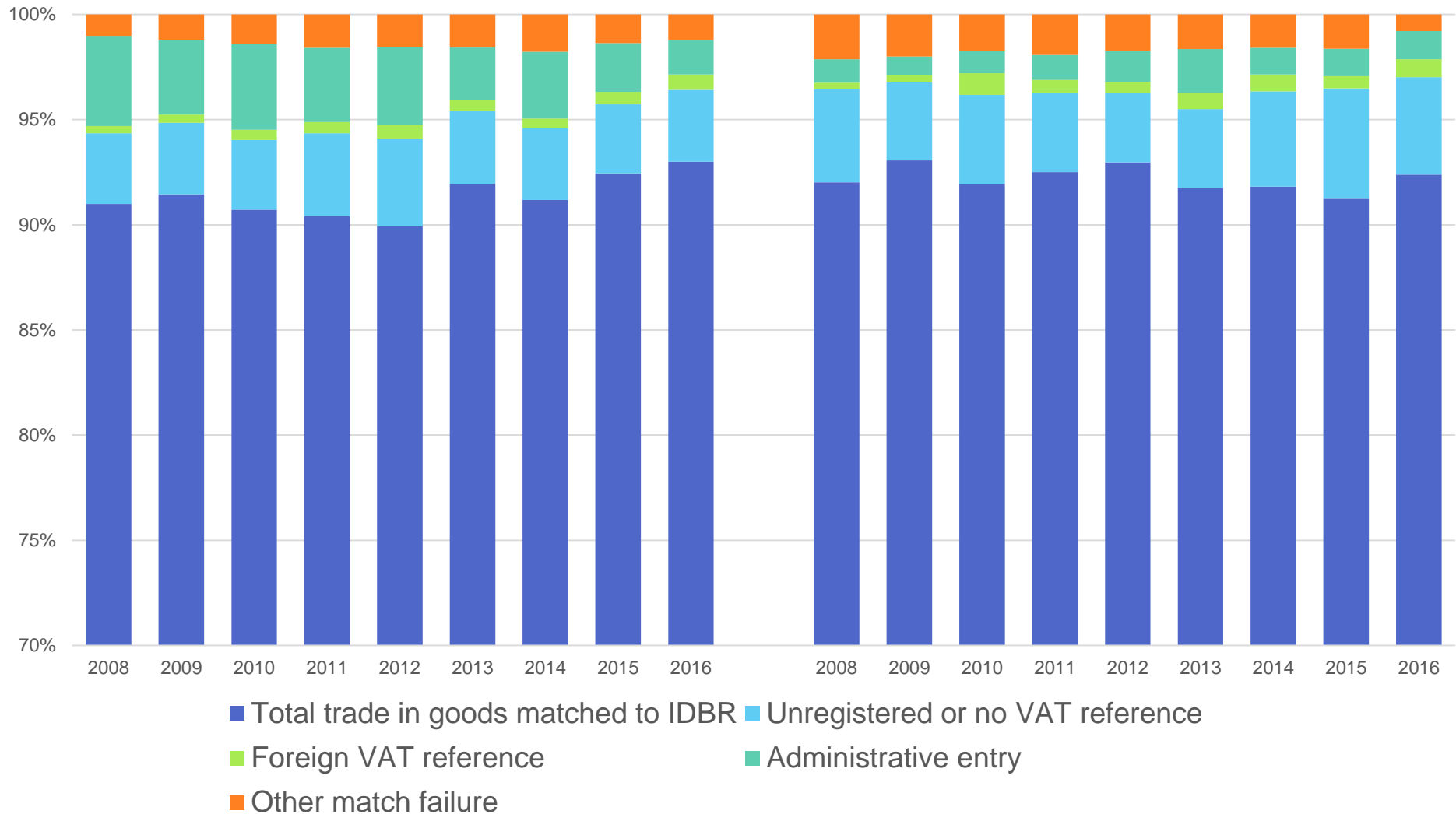
Methods

- The transactions data to which we have access is for VAT units...
- ...However, the estimates of productivity that we hold are on a Reporting Unit basis...
- ...which means that our work has proceeded in two stages:
 - a) Linking VATREF TIG data to Enterprises
 - b) Apportioning Enterprise trade to Reporting units

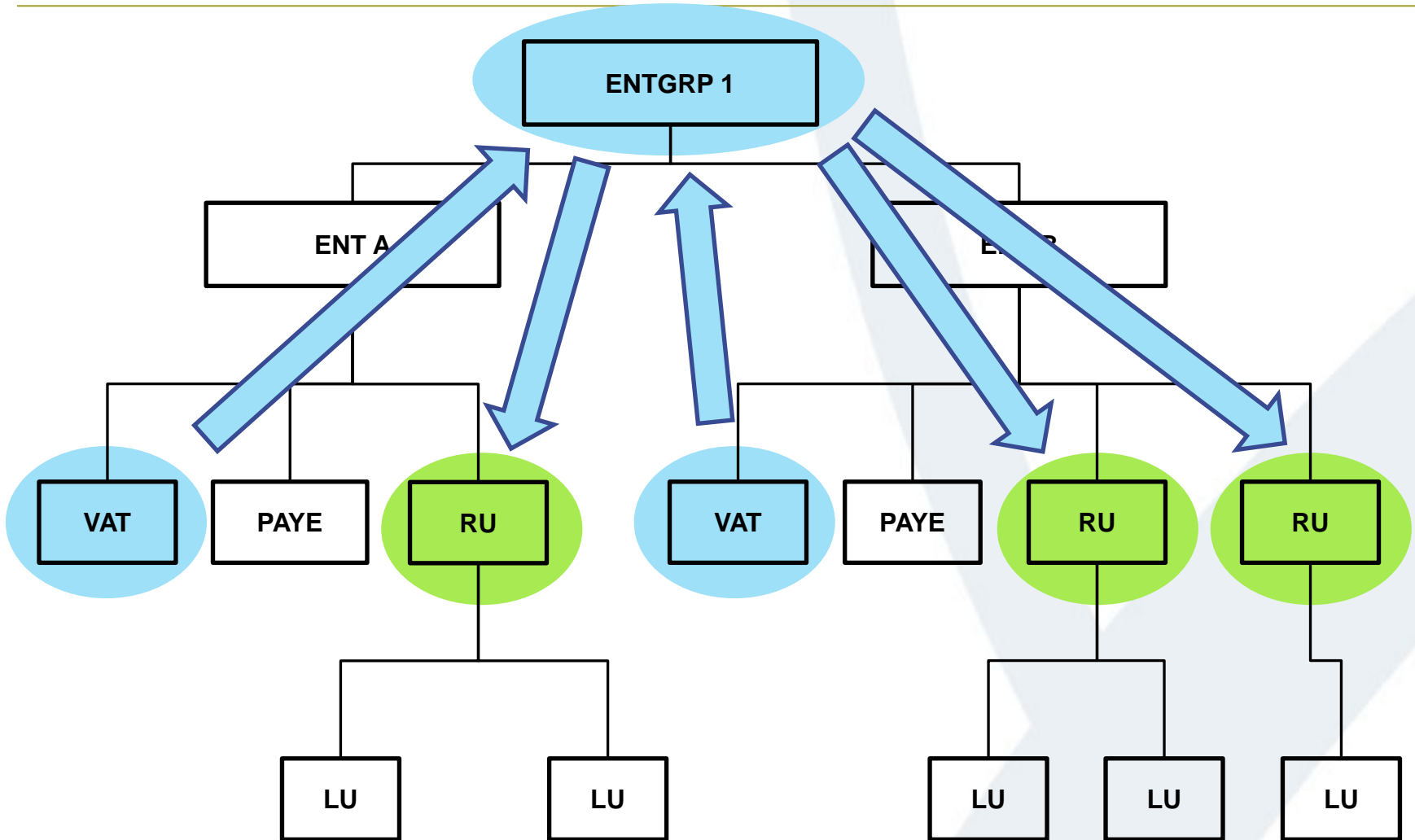
HMRC Data match success against IDBR

Exports

Imports



Methods



Apportionment methods

1. By employment

Divide Enterprise trade among the multiple reporting units of a business in proportion to employment

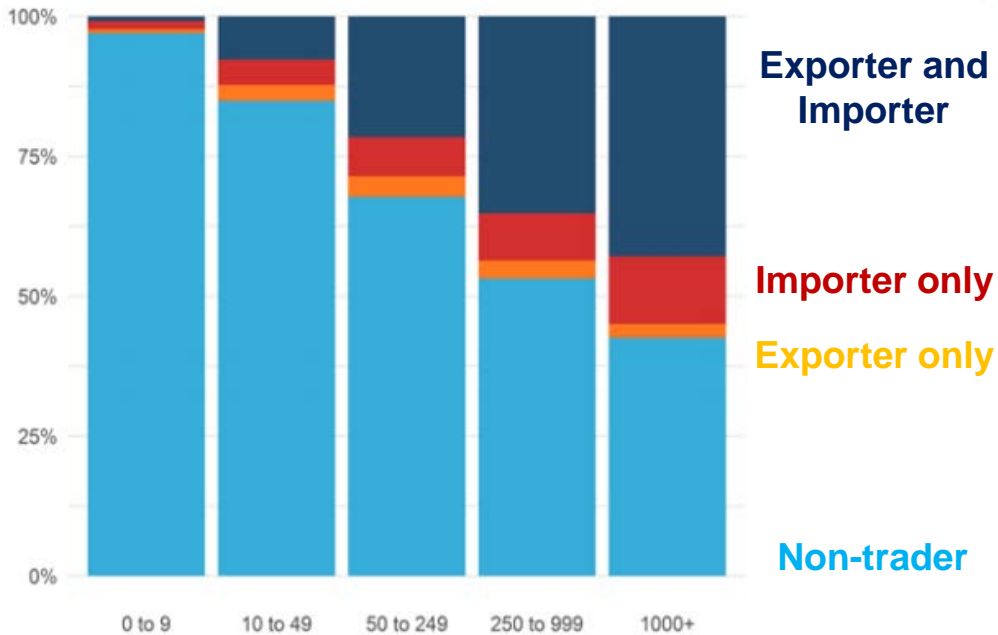
2. By Export/Import intensity of reporting unit industries

Divide Enterprise trade among the multiple reporting unit of a business based on industry-product weights matrix.

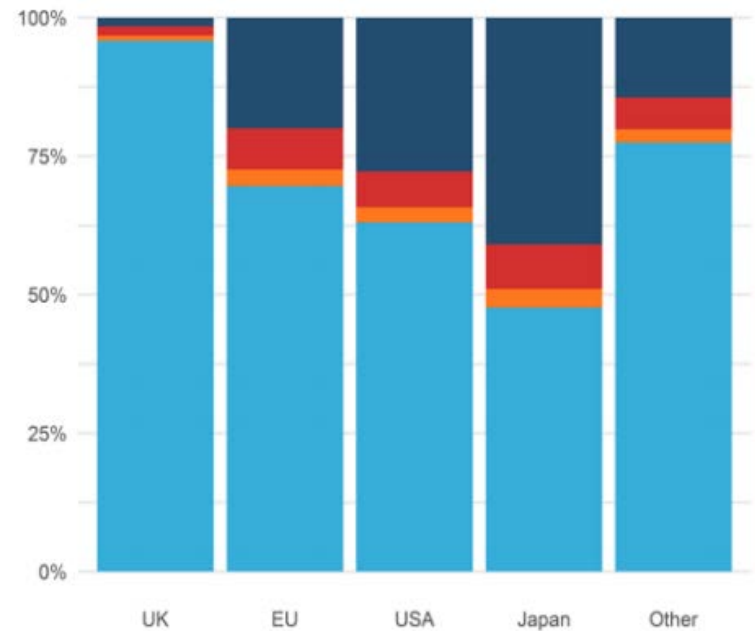
Results

Results

Businesses by Trader status and size-band

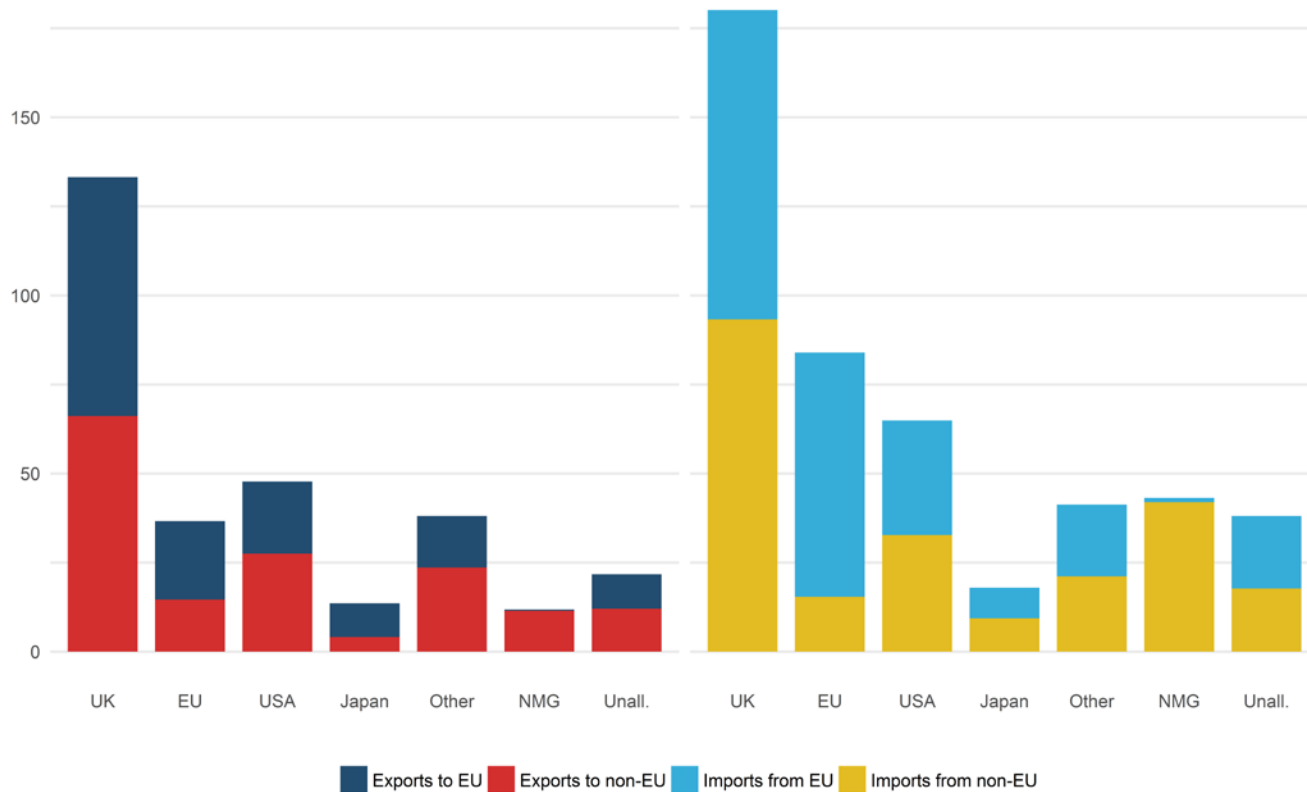


Businesses by Trader status and ownership



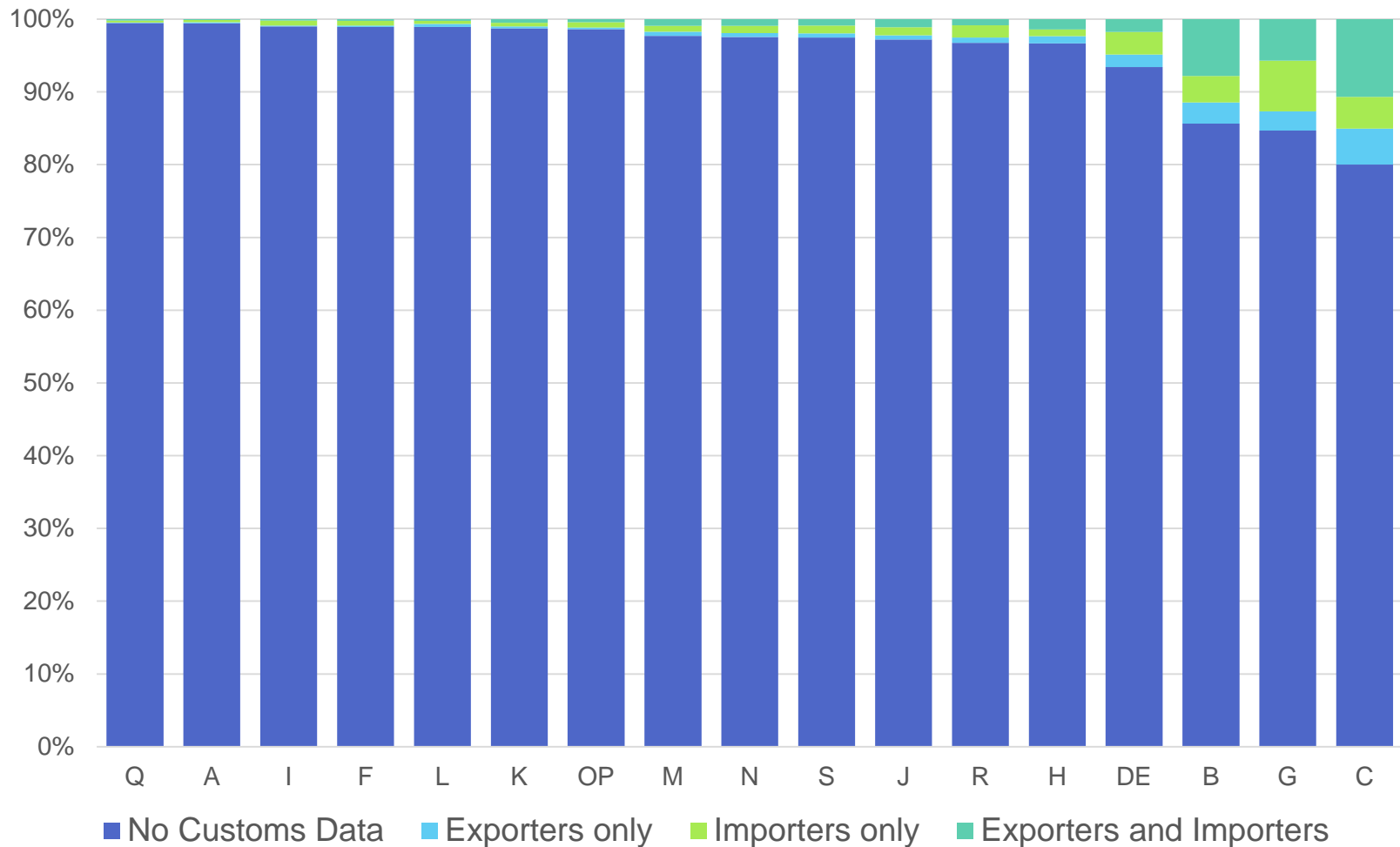
Results

Figure 11: Total trade by country of ultimate ownership, 2016, £bn, IDBR basis



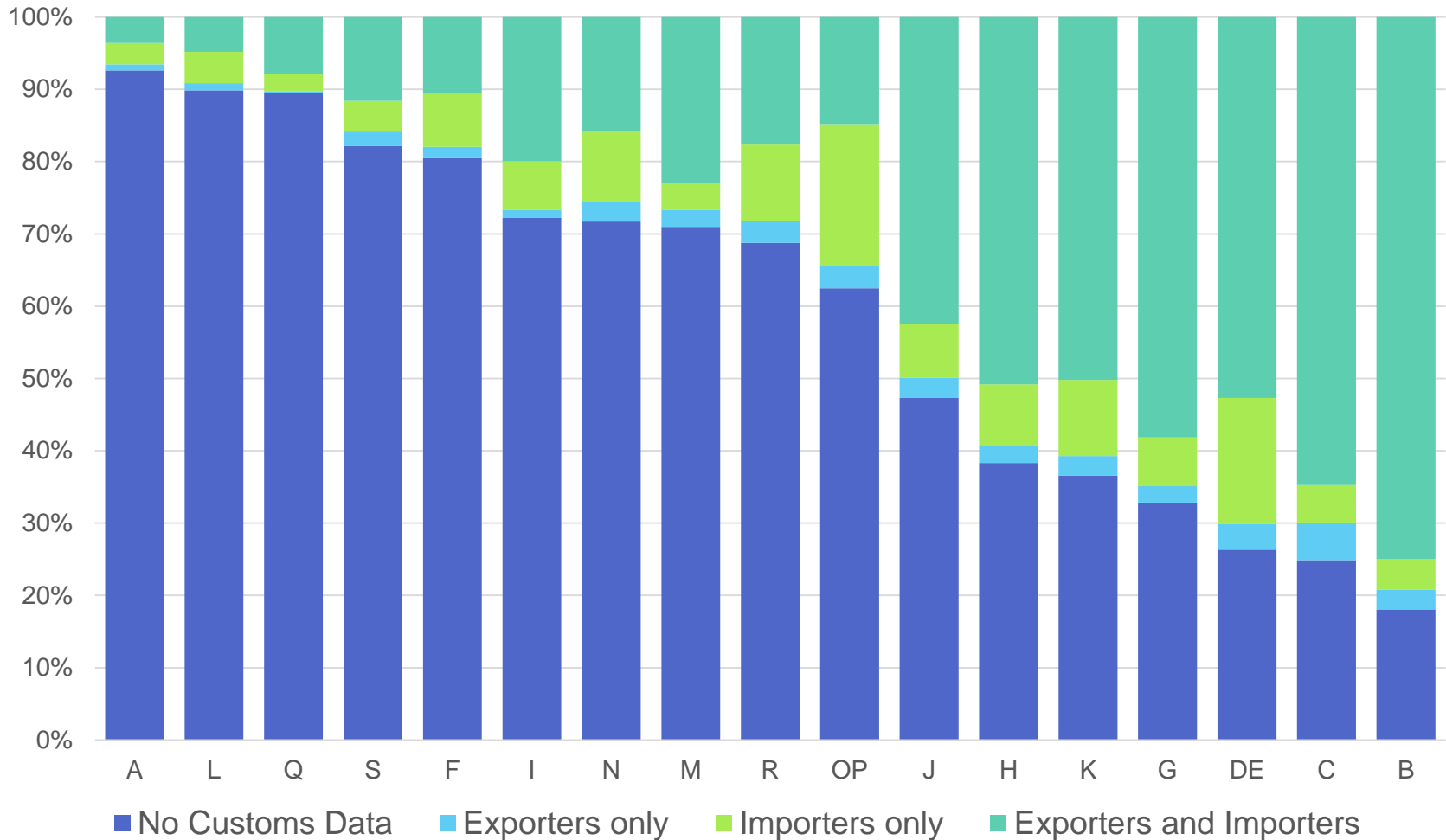
Results

Proportion of RUs by customs data status



Results

Proportion of employment by customs data status

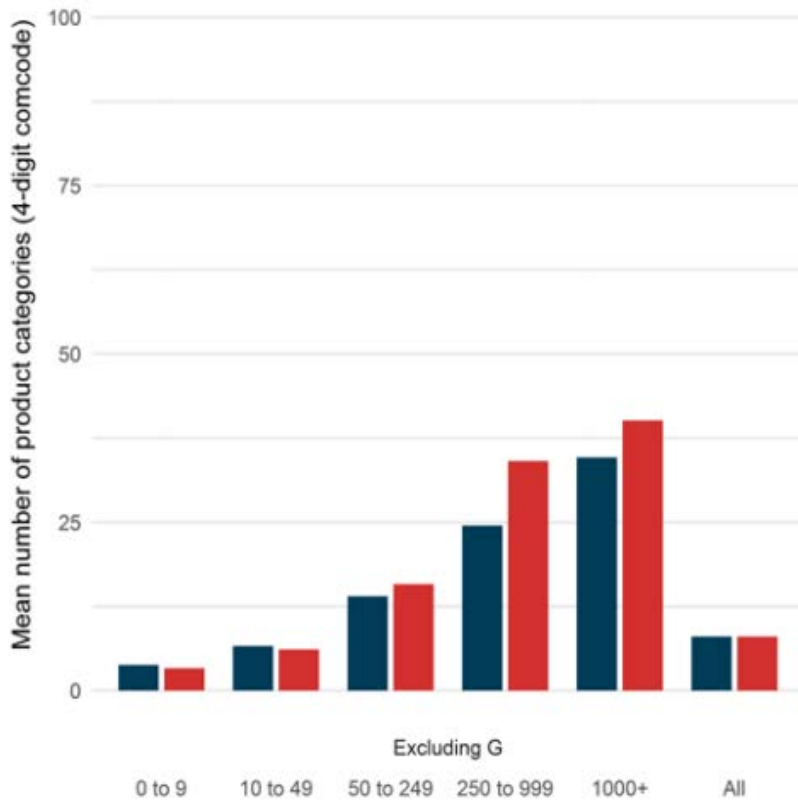


Results

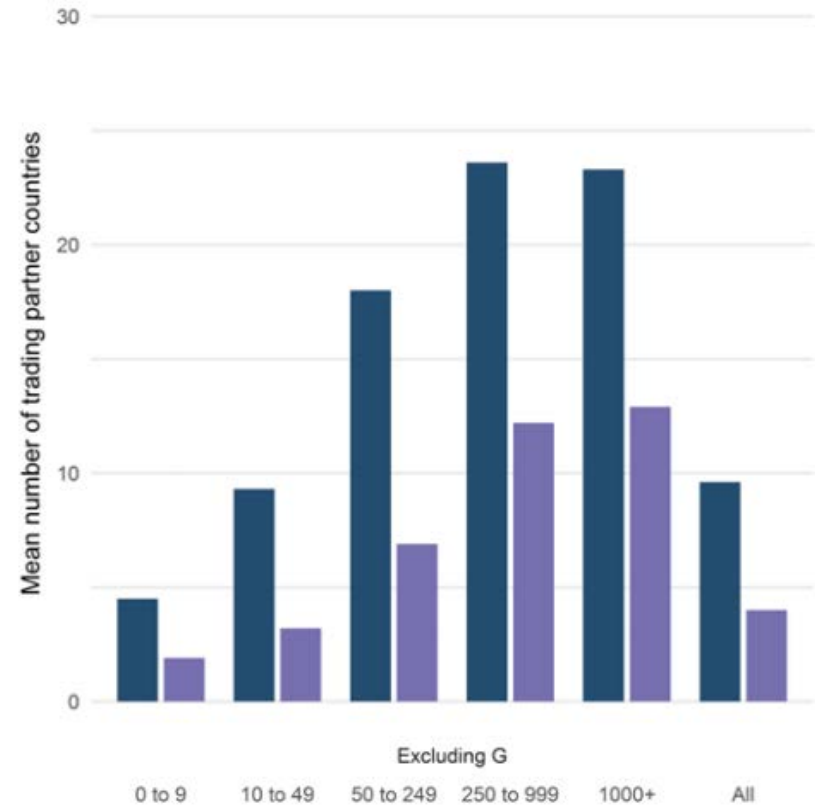
	50 exporters	100 exporters	500 exporters	2000 exporters		50 importers	100 importers	500 importers	2000 importers
2008	35.7	43.9	62.4	76.6		25.8	33.3	52.7	68.7
2009	34.9	42.9	61.8	76.6		26.0	33.2	52.2	67.5
2010	36.9	44.9	63.2	76.8		28.5	36.4	56.0	72.0
2011	38.9	46.5	63.8	76.7		29.5	37.2	56.5	72.1
2012	37.2	44.7	62.3	75.8		30.9	38.9	58.4	73.9
2013	44.2	51.2	66.5	78.4		32.1	40.1	58.7	73.9
2014	38.7	46.1	62.8	76.3		34.9	42.1	60.2	75.1
2015	40.0	47.3	64.2	77.7		36.5	43.7	61.3	75.6
2016	37.6	45.2	63.2	77.7		32.5	40.2	58.5	73.6

Results

Mean number of products traded by size-band

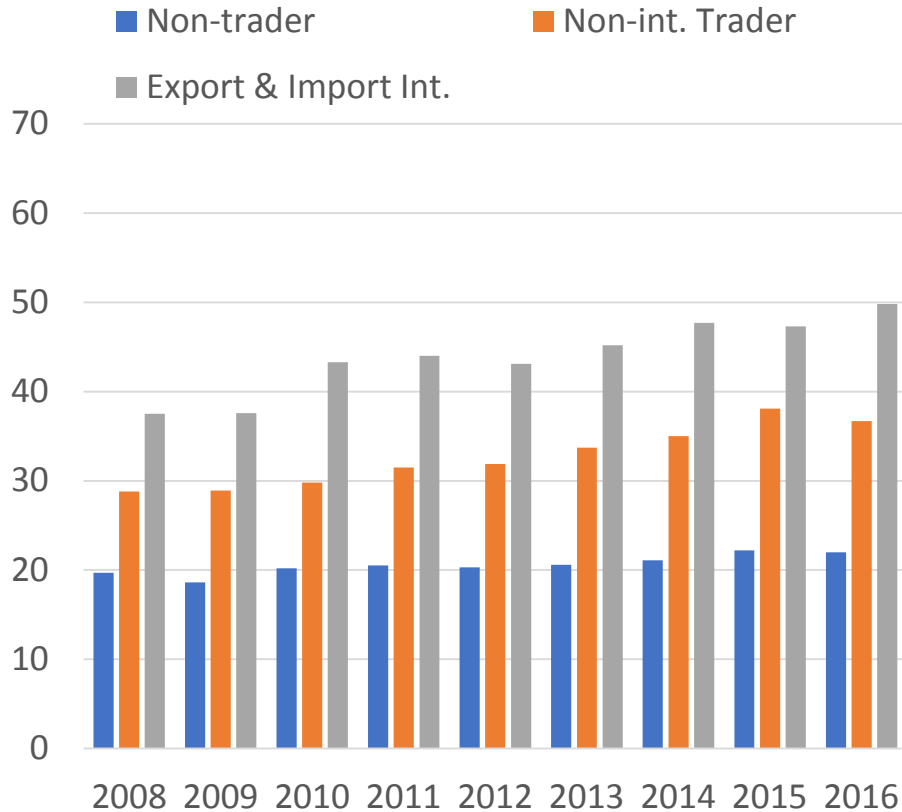


Mean number of trading partner countries by size-band



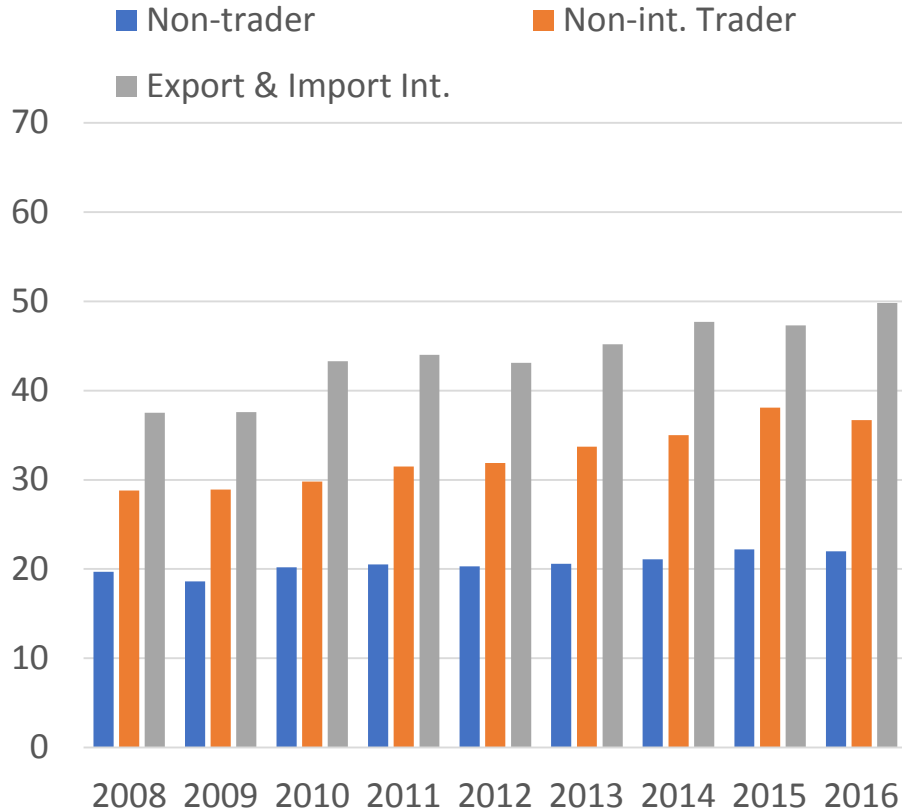
Results

Median Labour Productivity, £000s per worker

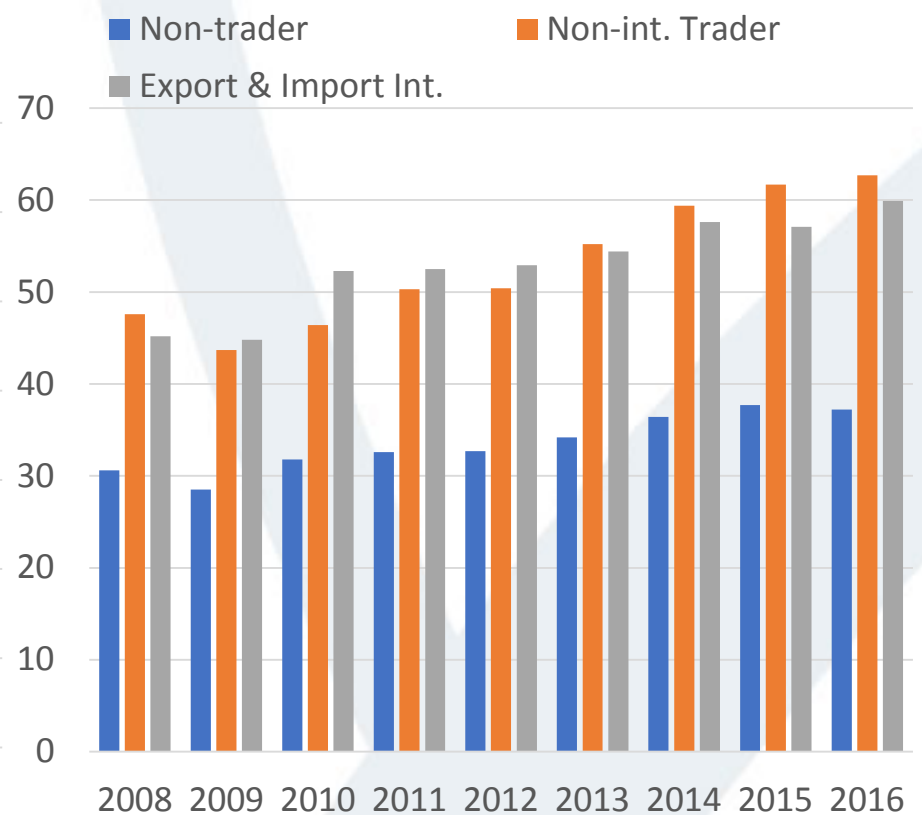


Results

Median Labour Productivity, £000s per worker

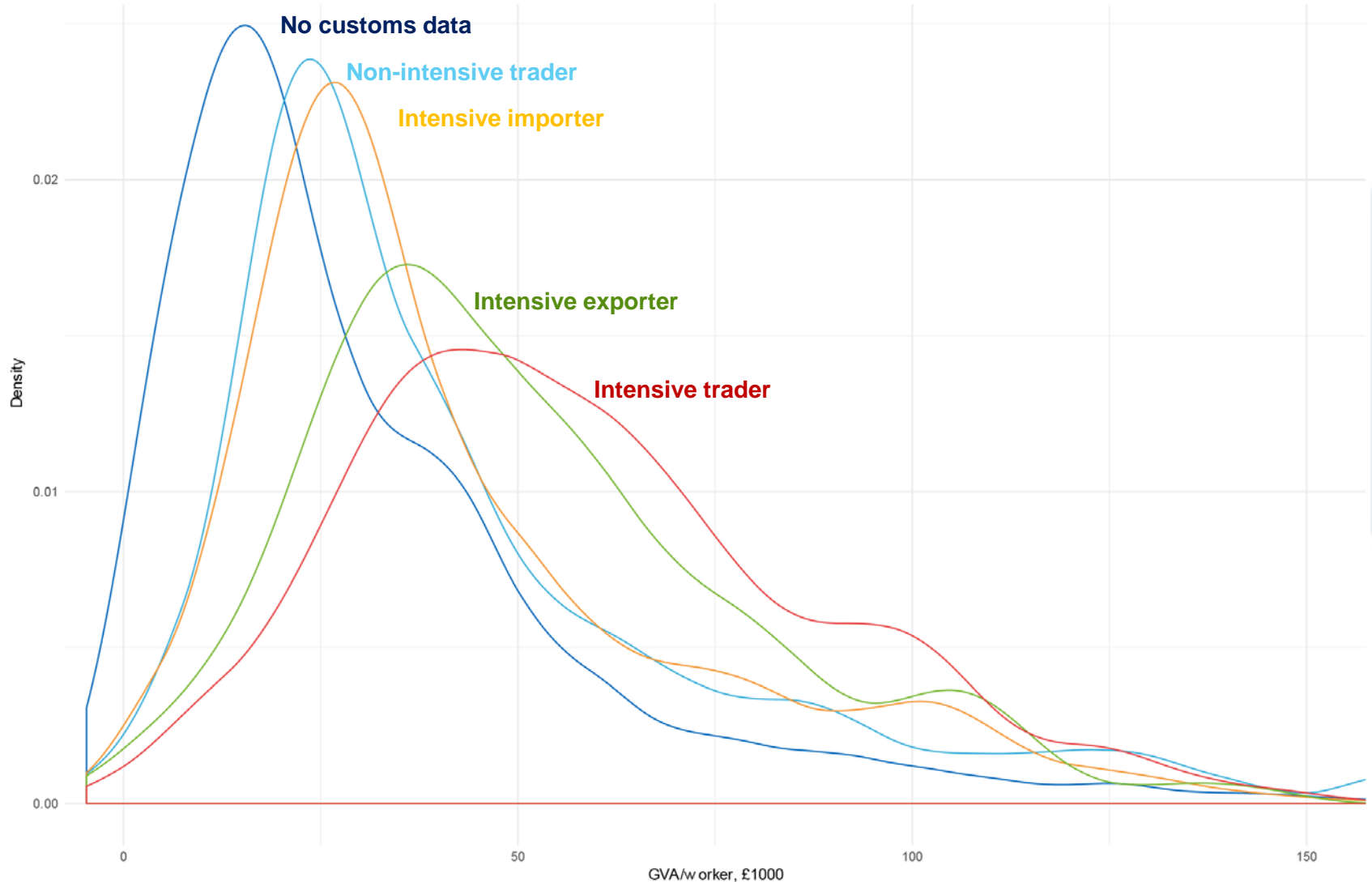


Mean Labour Productivity, £000s per worker



Results

Distribution of labour productivity by trader status: 2016, £000s per worker



Results

Regression analysis: Ln Prod on exporter/importer status

	(1)
i.Exp.	0.35^{***}
	(56.1)
i.Imp.	0.25^{***}
	(43.2)
ln(employment)	
i.Exp.-EU	
i.Exp-Non-EU	
i.Imp-EU	
i.Imp-Non-EU	
Year F.E.	No
Industry F.E.	No
Ownership F.E.	No
Adjusted R2	0.049
N	369,807

Results

Regression analysis: Ln Prod on exporter/importer status

	(1)	(2)
i.Exp.	0.35*** (56.1)	0.35*** (56.4)
i.Imp.	0.25*** (43.2)	0.26*** (44.5)
ln(employment)		
i.Exp.-EU		
i.Exp-Non-EU		
i.Imp-EU		
i.Imp-Non-EU		
Year F.E.	No	Yes
Industry F.E.	No	No
Ownership F.E.	No	No
Adjusted R2	0.049	0.054
N	369,807	369,807

Results

Regression analysis: Ln Prod on exporter/importer status

	(1)	(2)	(3)
i.Exp.	0.35^{***} (56.1)	0.35^{***} (56.4)	0.24^{***} (41.8)
i.Imp.	0.25^{***} (43.2)	0.26^{***} (44.5)	0.27^{***} (49.5)
ln(employment)			
i.Exp.-EU			
i.Exp-Non-EU			
i.Imp-EU			
i.Imp-Non-EU			
Year F.E.	No	Yes	Yes
Industry F.E.	No	No	Yes
Ownership F.E.	No	No	No
Adjusted R2	0.049	0.054	0.202
N	369,807	369,807	369,041

Results

Regression analysis: Ln Prod on exporter/importer status

	(1)	(2)	(3)	(4)
i.Exp.	0.35^{***} (56.1)	0.35^{***} (56.4)	0.24^{***} (41.8)	0.21^{***} (35.9)
i.Imp.	0.25^{***} (43.2)	0.26^{***} (44.5)	0.27^{***} (49.5)	0.22^{***} (37.2)
ln(employment)				0.021^{***} (24.8)
i.Exp.-EU				
i.Exp-Non-EU				
i.Imp-EU				
i.Imp-Non-EU				
Year F.E.	No	Yes	Yes	Yes
Industry F.E.	No	No	Yes	Yes
Ownership F.E.	No	No	No	No
Adjusted R2	0.049	0.054	0.202	0.203
N	369,807	369,807	369,041	369,041

Results

Regression analysis: Ln Prod on exporter/importer status

	(1)	(2)	(3)	(4)	(5)
i.Exp.	0.35^{***} (56.1)	0.35^{***} (56.4)	0.24^{***} (41.8)	0.21^{***} (35.9)	0.21^{***} (34.6)
i.Imp.	0.25^{***} (43.2)	0.26^{***} (44.5)	0.27^{***} (49.5)	0.22^{***} (37.2)	0.20^{***} (33.8)
ln(employment)				0.021^{***} (24.8)	0.017^{***} (20.3)
i.Exp.-EU					
i.Exp-Non-EU					
i.Imp-EU					
i.Imp-Non-EU					
Year F.E.	No	Yes	Yes	Yes	Yes
Industry F.E.	No	No	Yes	Yes	Yes
Ownership F.E.	No	No	No	No	Yes
Adjusted R2	0.049	0.054	0.202	0.203	0.205
N	369,807	369,807	369,041	369,041	369,041

Results

Regression analysis: Ln Prod on exporter/importer status

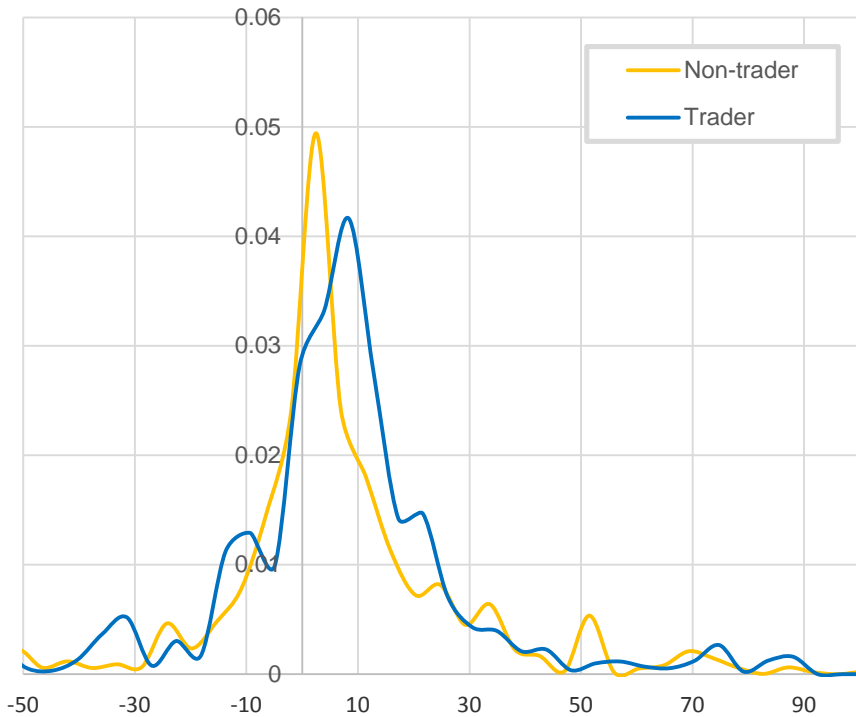
	(1)	(2)	(3)	(4)	(5)	(6)
i.Exp.	0.35^{***} (56.1)	0.35^{***} (56.4)	0.24^{***} (41.8)	0.21^{***} (35.9)	0.21^{***} (34.6)	
i.Imp.	0.25^{***} (43.2)	0.26^{***} (44.5)	0.27^{***} (49.5)	0.22^{***} (37.2)	0.20^{***} (33.8)	
ln(employment)				0.021^{***} (24.8)	0.017^{***} (20.3)	0.019^{***} (22.2)
i.Exp.-EU						0.043^{***} (5.85)
i.Exp-Non-EU						0.19^{***} (30.2)
i.Imp-EU						0.017^{**} (2.62)
i.Imp-Non-EU						0.18^{***} (30.7)
Year F.E.	No	Yes	Yes	Yes	Yes	Yes
Industry F.E.	No	No	Yes	Yes	Yes	Yes
Ownership F.E.	No	No	No	No	Yes	Yes
Adjusted R2	0.049	0.054	0.202	0.203	0.205	0.204
N	369,807	369,807	369,041	369,041	369,041	369,041

Initial Results: Expectations

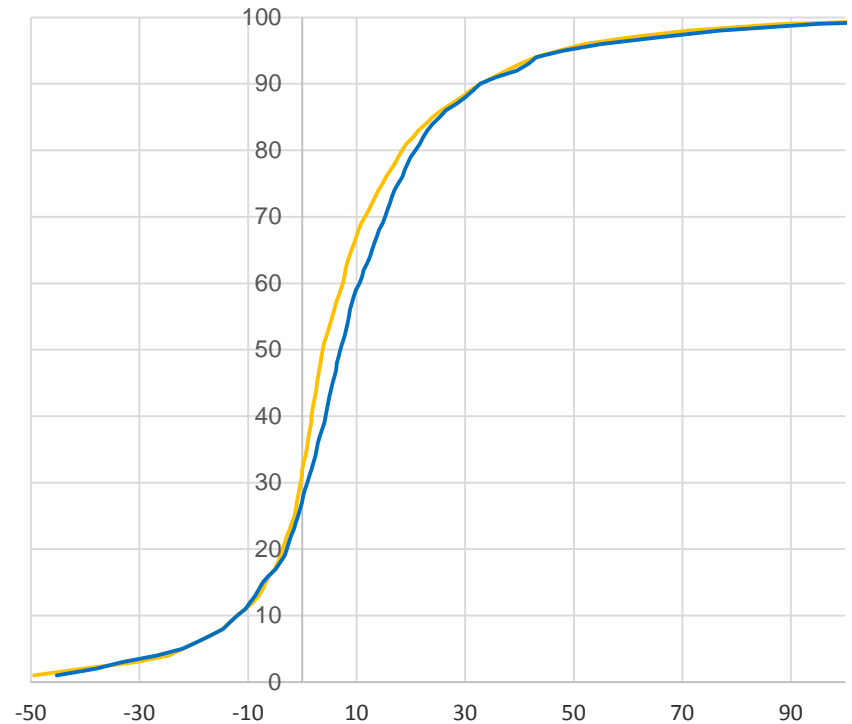
Initial Results: Expectations

Turnover growth expectations stronger for traders...

Density of growth expectations



Cumulative density of growth expectations

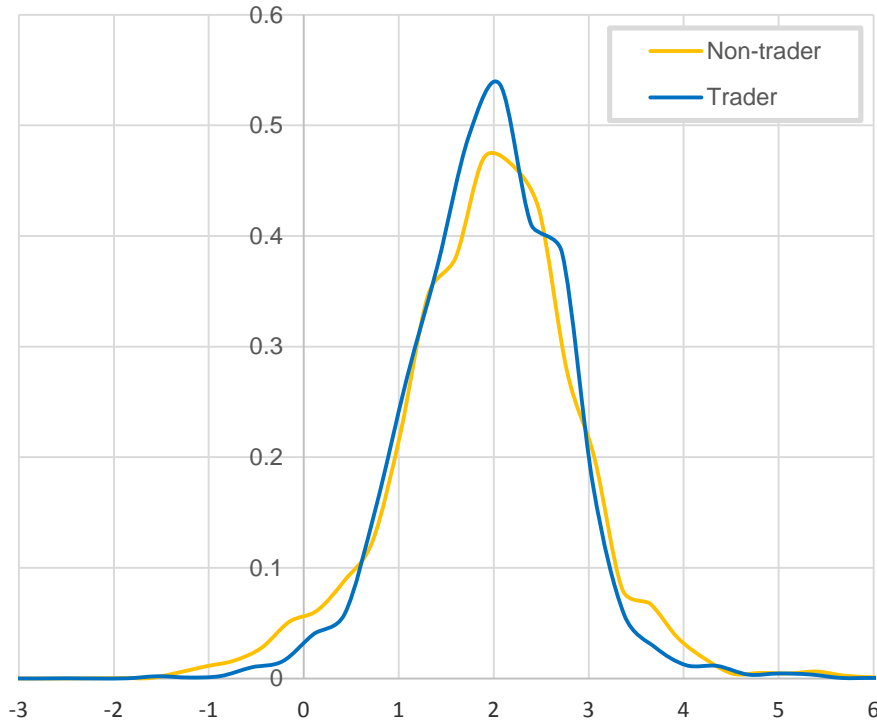


Expected growth, 2016-2018

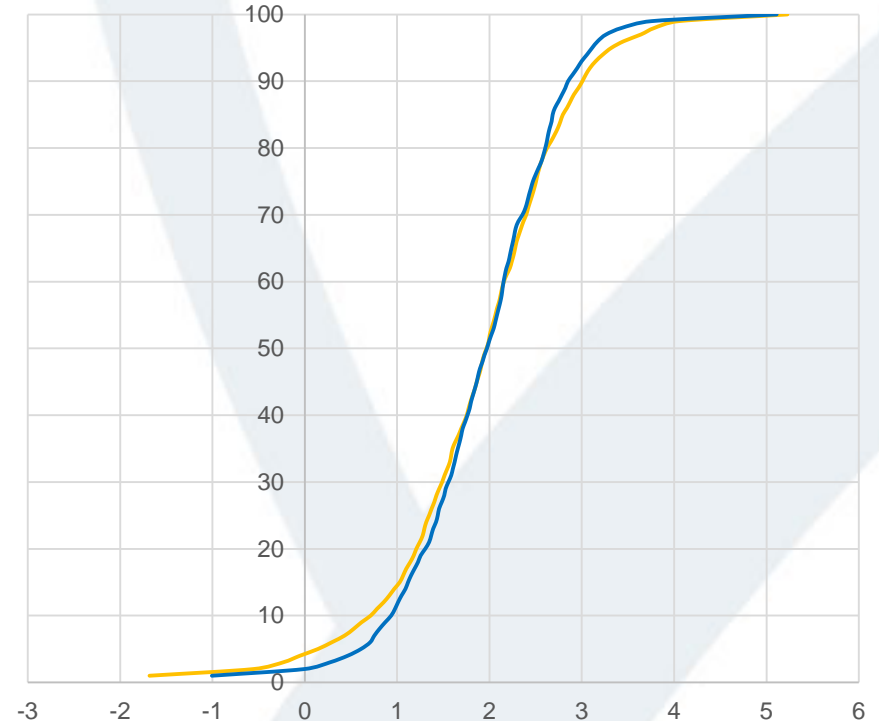
Initial Results: Expectations

...with little difference in levels of uncertainty...

Density of uncertainty measure



Cumulative density of uncertainty measure

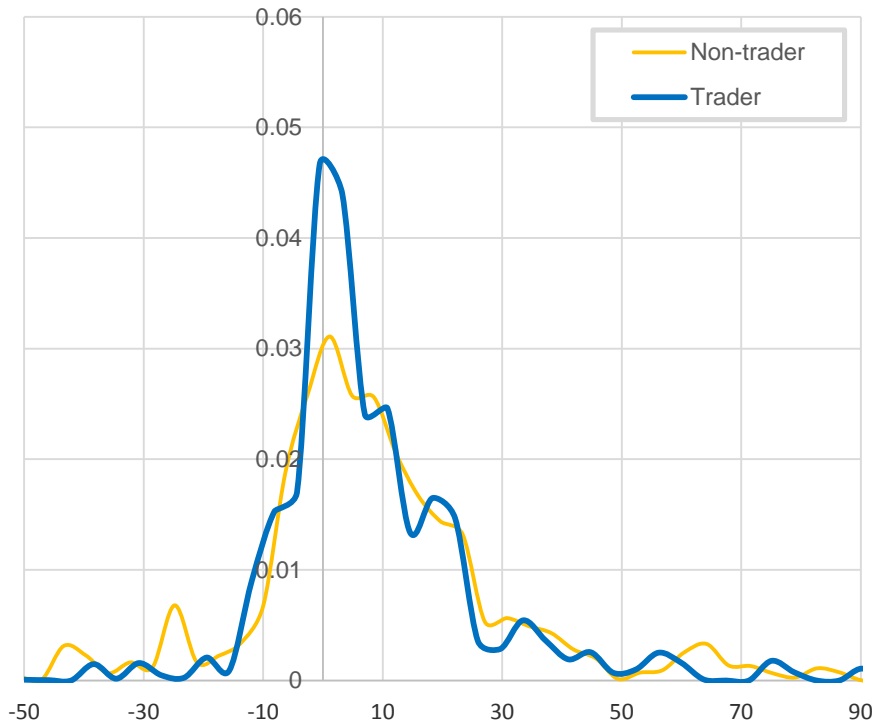


Forecast uncertainty, 2016-2018

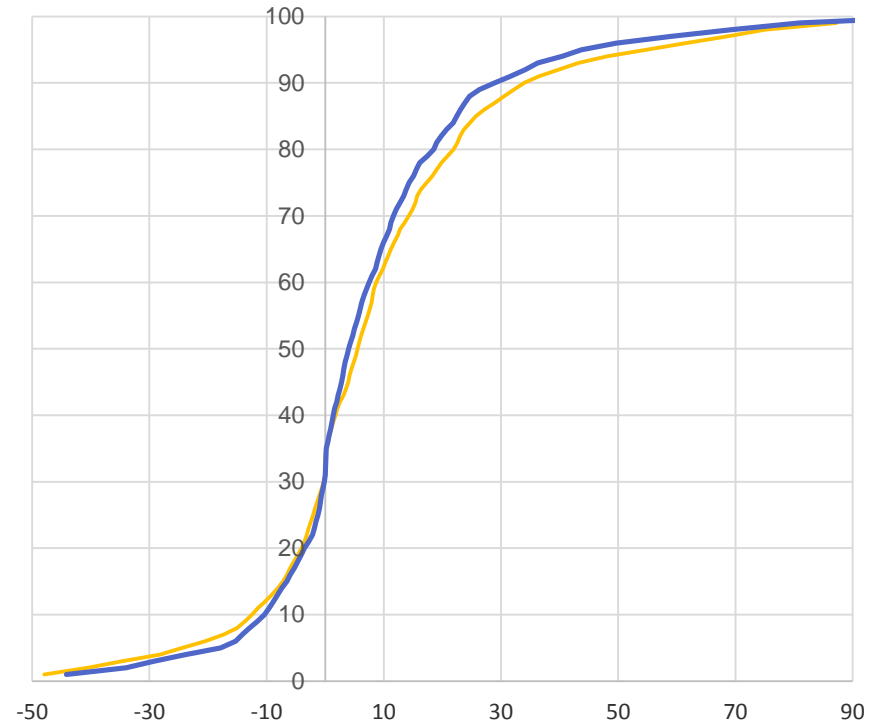
Initial Results: Expectations

...employment growth expectations more concentrated for traders...

Density of growth expectations



Cumulative density of growth expectations

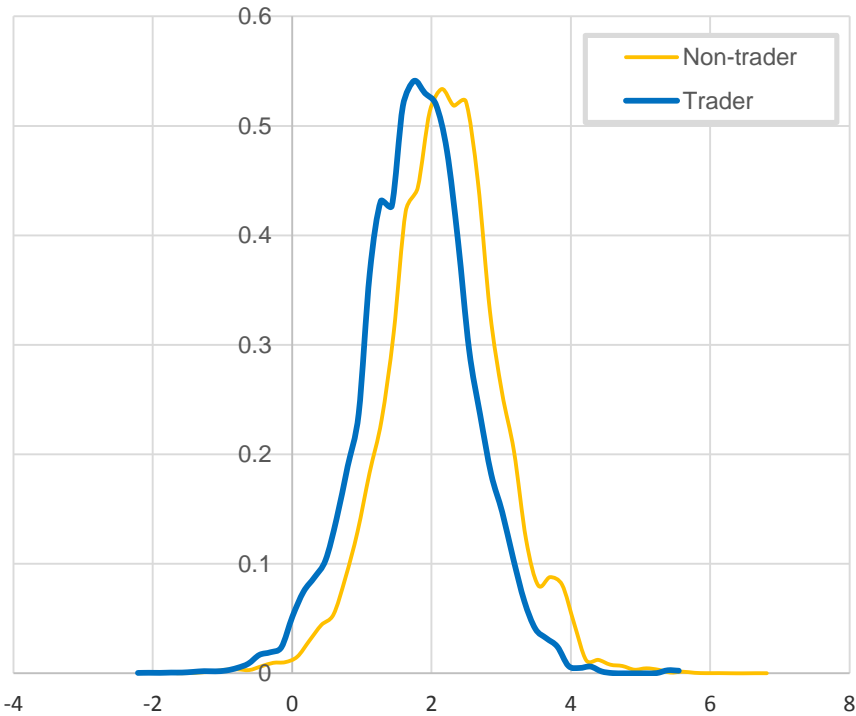


Expected growth, 2016-2018

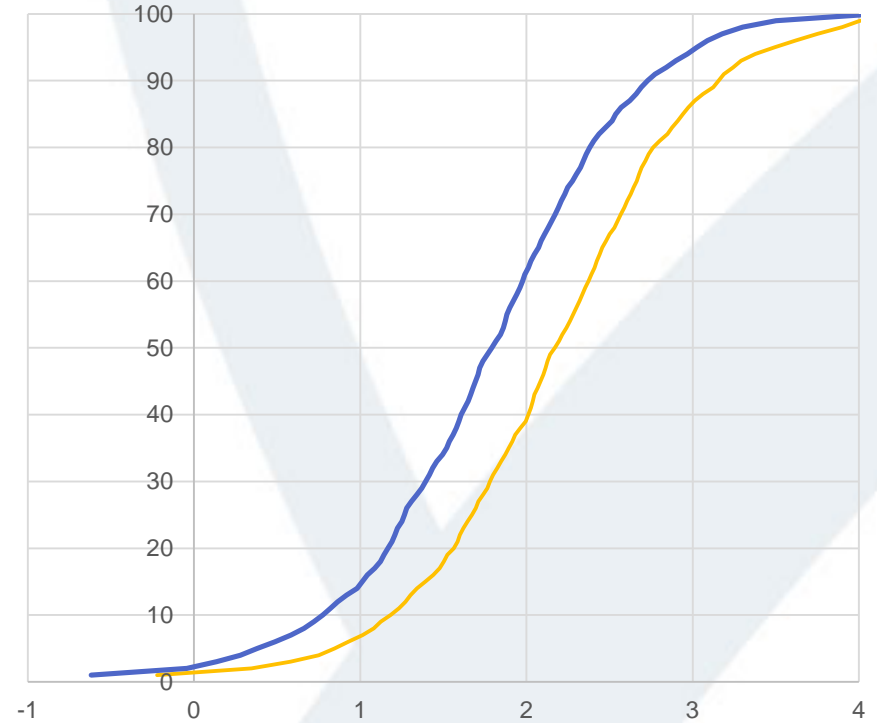
Initial Results: Expectations

...and more certain, pointing to confounding effects...

Density of uncertainty measure



Cumulative density of uncertainty measure



Forecast uncertainty, 2016-2018

Next Steps

- Re-examine the overlap between MES, ABS and trader status
- Conditional analysis: if we control for firm-level characteristics, how are uncertainty/expectations and trader status related?
- Use more detailed metrics on trading: intensity, geographical exposure?

Questions?
