CBAs as FDI:
Potential Implications for Trade, Restructuring and Growth in the Food Sector

Steve McCorriston
University of Exeter, UK

Nils Herger
Study Centre Gerzensee, Switzerland

How do industries change and what are the implications?

- Internal investment, technological improvements, increased competitiveness etc

- Exogenous events: e.g. 'new' new trade theory on the implications of trade reform/de-regulation

- Mergers and acquisitions:

  Sexton (2000) comments that mergers and acquisitions and changes in the extent of market concentration has been one of the most notable features of structural changes in the food sector worldwide

- These are related but the focus here is on international dimensions associated with foreign investment

Focus here

- On the international dimensions of industry change associated with FDI but specifically Cross-Border Acquisitions in the world economy

- Specifically, new insights into what the world of CBAs looks like and how this ties in with the traditional perspectives of FDI

- How this framework extends to addressing CBAs (and DMAs) in the food sector

- Simplistic question(s):
  (i) are CBAs based on a 'gravity story' or a 'finance' story?
  (ii) does this depend on the form CBAs take?
  (iii) will these considerations also impact on DMAs?

- The one thing to note as we address these issues is the data which is based on firm-level observations
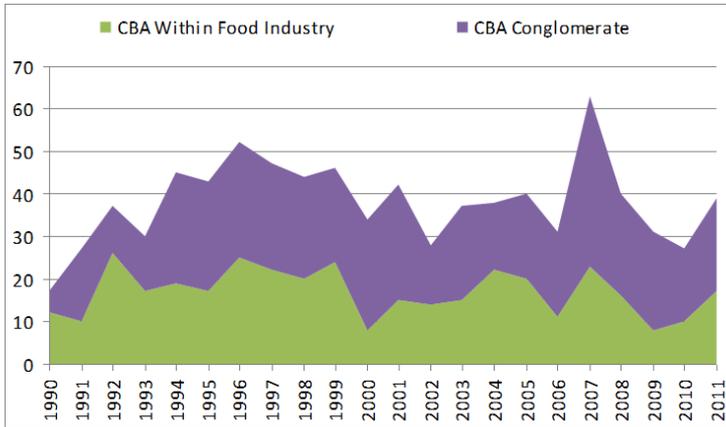
FT June 4th, 2015:
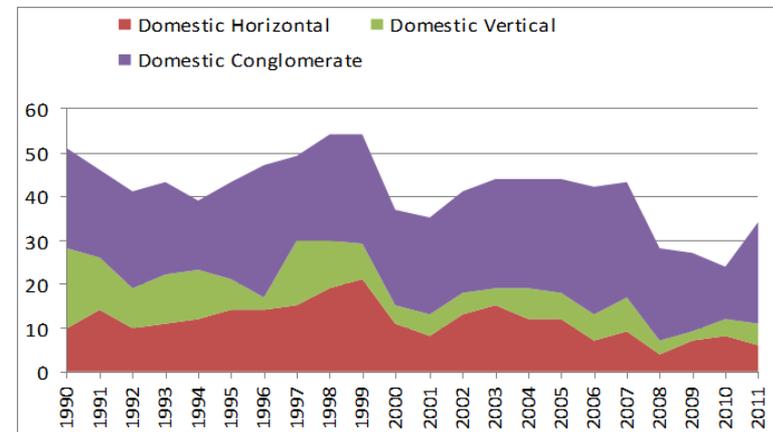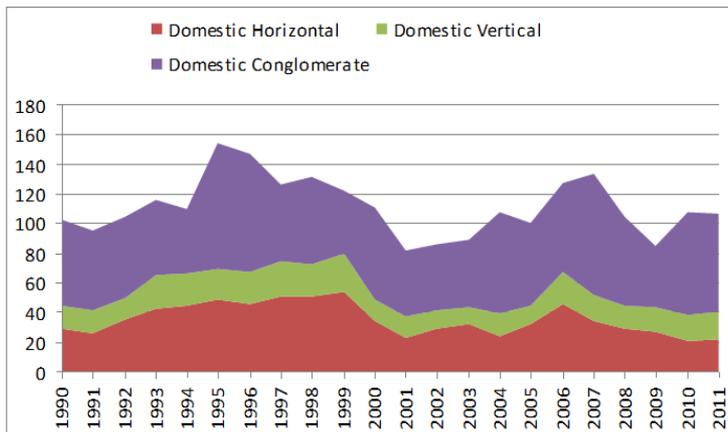A dark interpretation of the M&A boom is of a financial system drowning in cash and credit
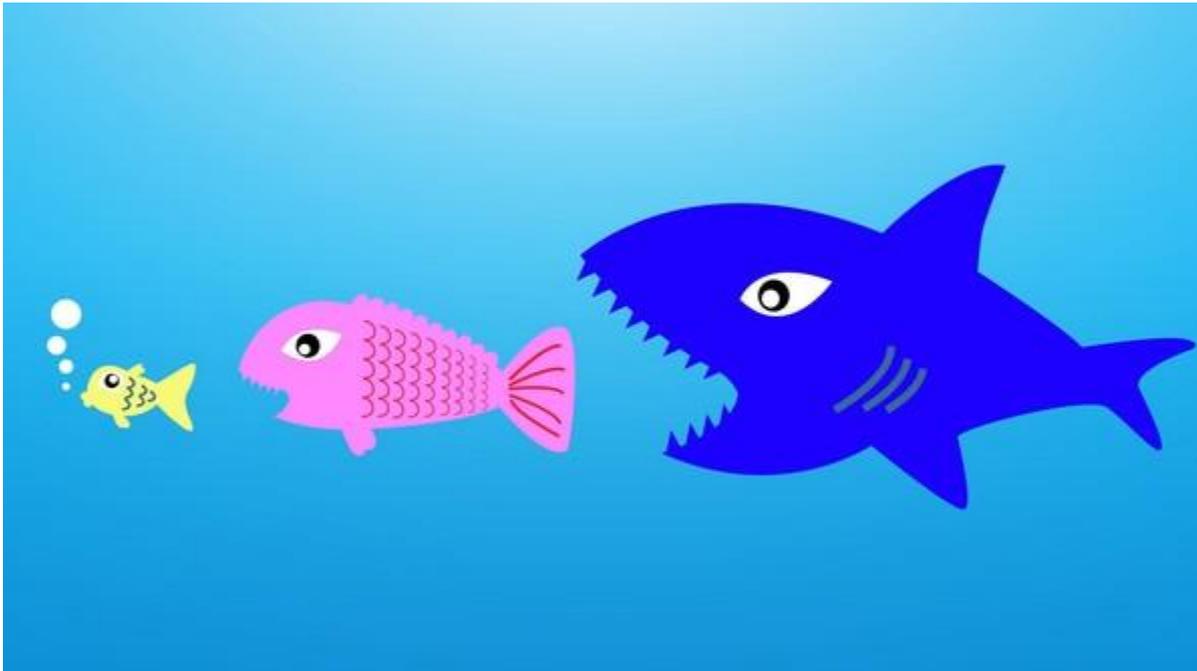
A prelude to food sector issues

US

UK
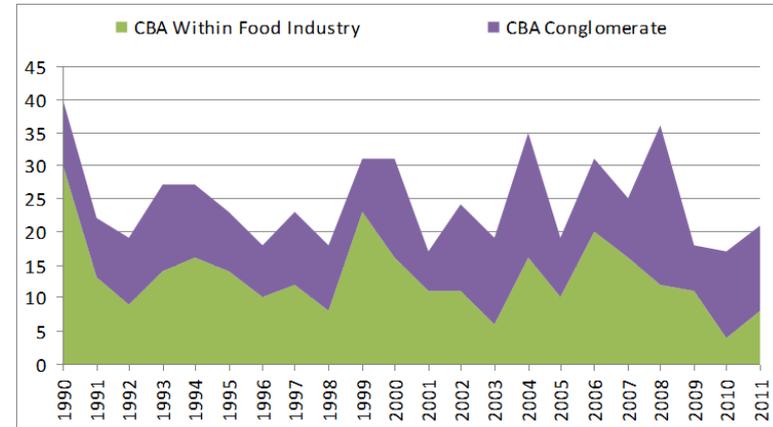
General comments about FDI to benchmark the discussion

- FDI is a key feature of the world economy; there are some papers on this in ag econ but not that many

- Potential gains: expands production/brings greater efficiency via accessing lower cost inputs/spillovers and new technology

- Seen as being more beneficial than other forms of capital flows (such as portfolio flows) because it is less volatile

- Governments see these potential benefits and develop policies to attract FDI

- Considerable research on these issues but a key part of this research relates to understanding the form of FDI, how these forms are distributed throughout the world economy and the growth of FDI

- In much research, addressing the form of FDI and the flows of FDI have been separate streams of research-what we deal with below combines these issues

- To get a picture of these issues, next slides

World FDI Flows: 1970-2011(Current Values, US $)
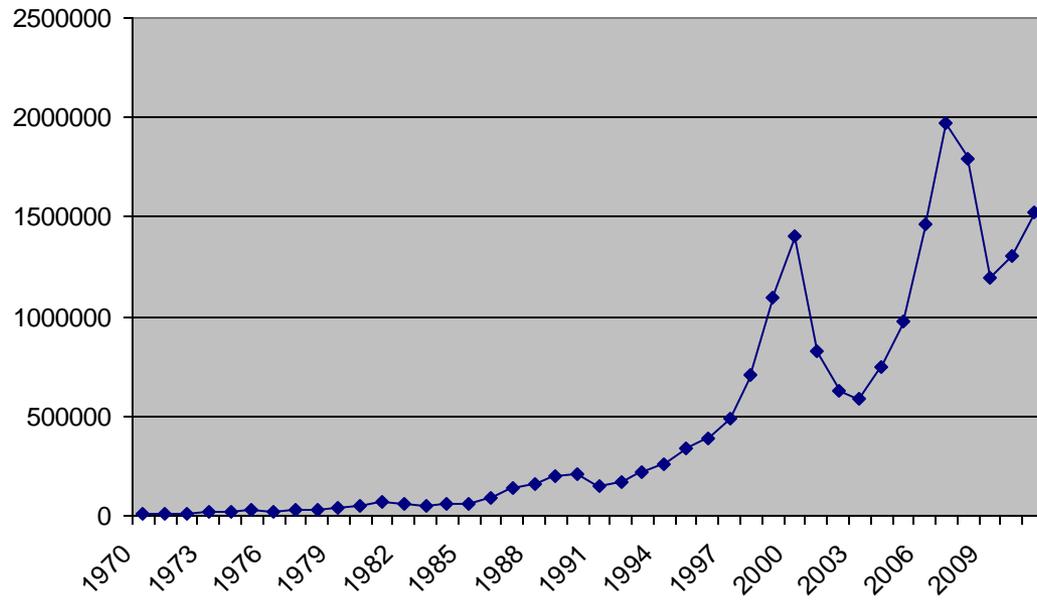
World Trade, Foreign Direct Investment and GDP, 1970-1998

(Index, 1970=100)

- --·-- World trade
- —— World GDP
- —▲— World FDI

ırce: IMF (2001), UNCTAD (2001)

World

4.4

Russia

7.2

51.5

450

23.5

Canada

17.5

17   27

Europe

78

15.7

7.8

251

7.5

Asia

Japan

U.S.

4.3

7.4

5

1.6

4.9

China & other Asia

0.3

4.7

14.3

0.7

Africa

0.5

0.4

5.2

12.3

142

0.4   0.9

Latin America

8.5

World

Australia, N.Z.

World

95
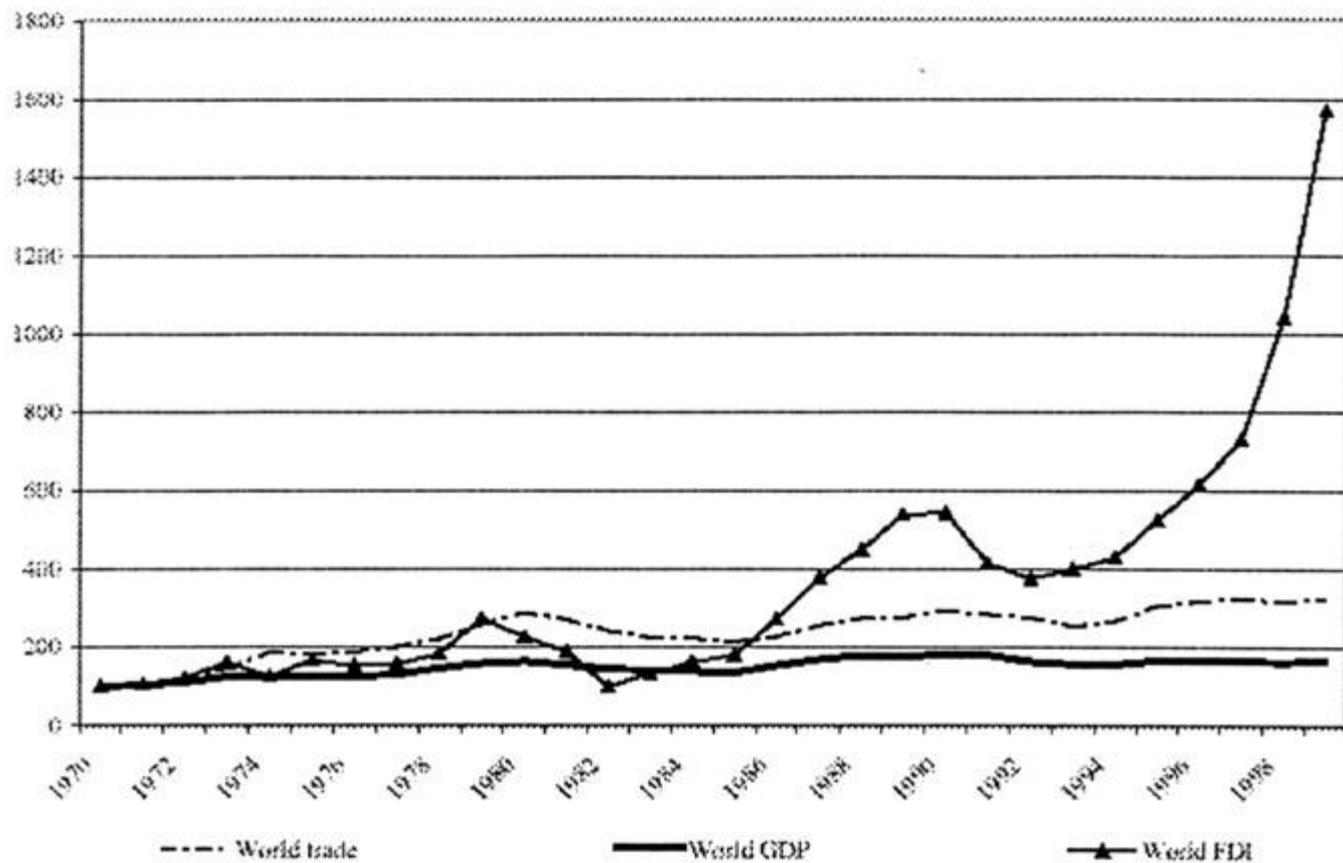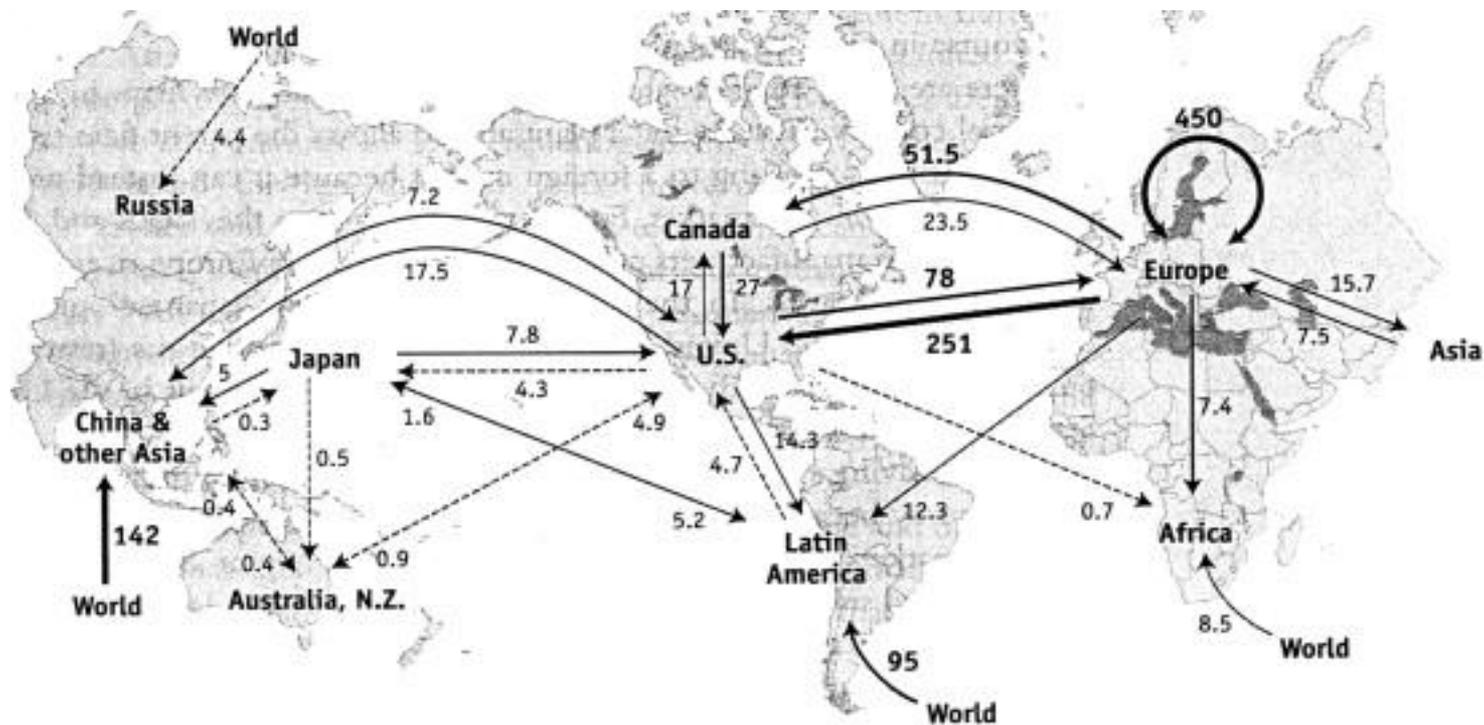
World

Total world FDI flows in 2000: $1,400 billion

World FDI Flows

-------- < $5 billion

———— $5–25 billion

———— $25–100 billion

———— > $100 billion

ws of Foreign Direct Investment, 2000 ($ billions)
s figure shows flows of foreign direct investment between
ected countries and regions of the world for 2000 in billions of
lars. The flow of investment is illustrated by the width of the

lines, with the largest flows having the heaviest lines and the
smallest having dashed lines.

Source: OECD and UN foreign investment data.

A workhorse model that aims to explain this pattern due to Markusen: FDI in the World Economy with High Trade Costs
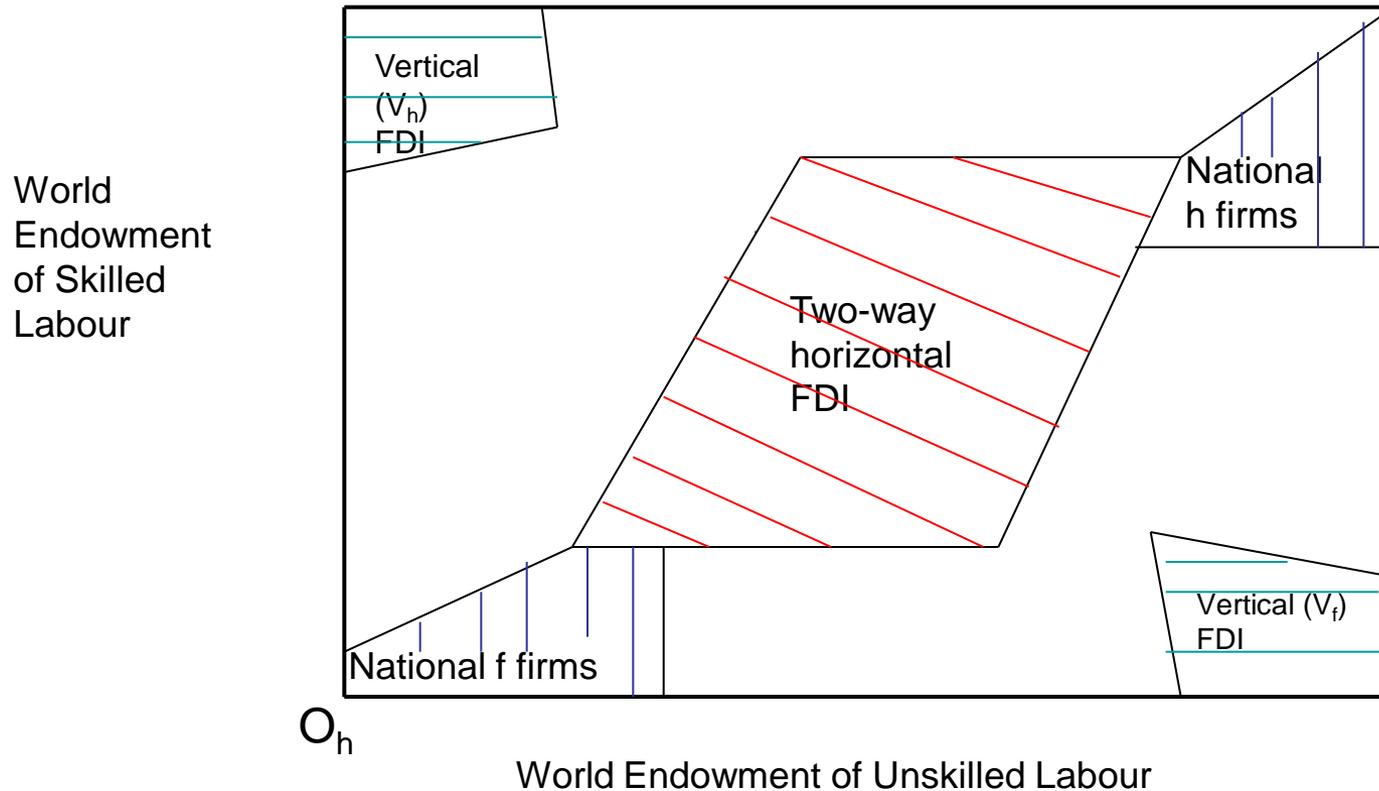
What does this predict? (i) between countries with relatively similar factor endowments, horizontal FDI; (ii) vertical FDI with countries with relatively dissimilar factor endowments

CBAs (rather than greenfield investment) as FDI

- Increasing attention paid to this form of FDI from trade and finance economists

  (financial economists largely addressed domestic mergers and acquisitions)

- Why?
- …up to 80% of FDI in any year is in the form of CBAs
- …the distribution of CBAs (i.e. the market for corporate control) conforms with the geographical distribution of FDI as shown above as does the booms in activity
- …data accessibility

Some similarities between greenfield and CBAs but potentially some differences

- Potentially anti-competitive

- What is the firm acquiring (cherries or bargains)?

- Driven by factors not picked up in traditional literature on FDI

- For example, 'core' competencies; valuation of assets; control to diminish hold-up issues etc

- Go back to the Markusen figure: does the world look like this?

A workhorse model that aims to explain this pattern due to Markusen: FDI in the World Economy with High Trade Costs

World Endowment of Skilled Labour

Vertical (V_h) FDI

National h firms

Two-way horizontal FDI

National f firms

Vertical (V_f) FDI

O_h

World Endowment of Unskilled Labour
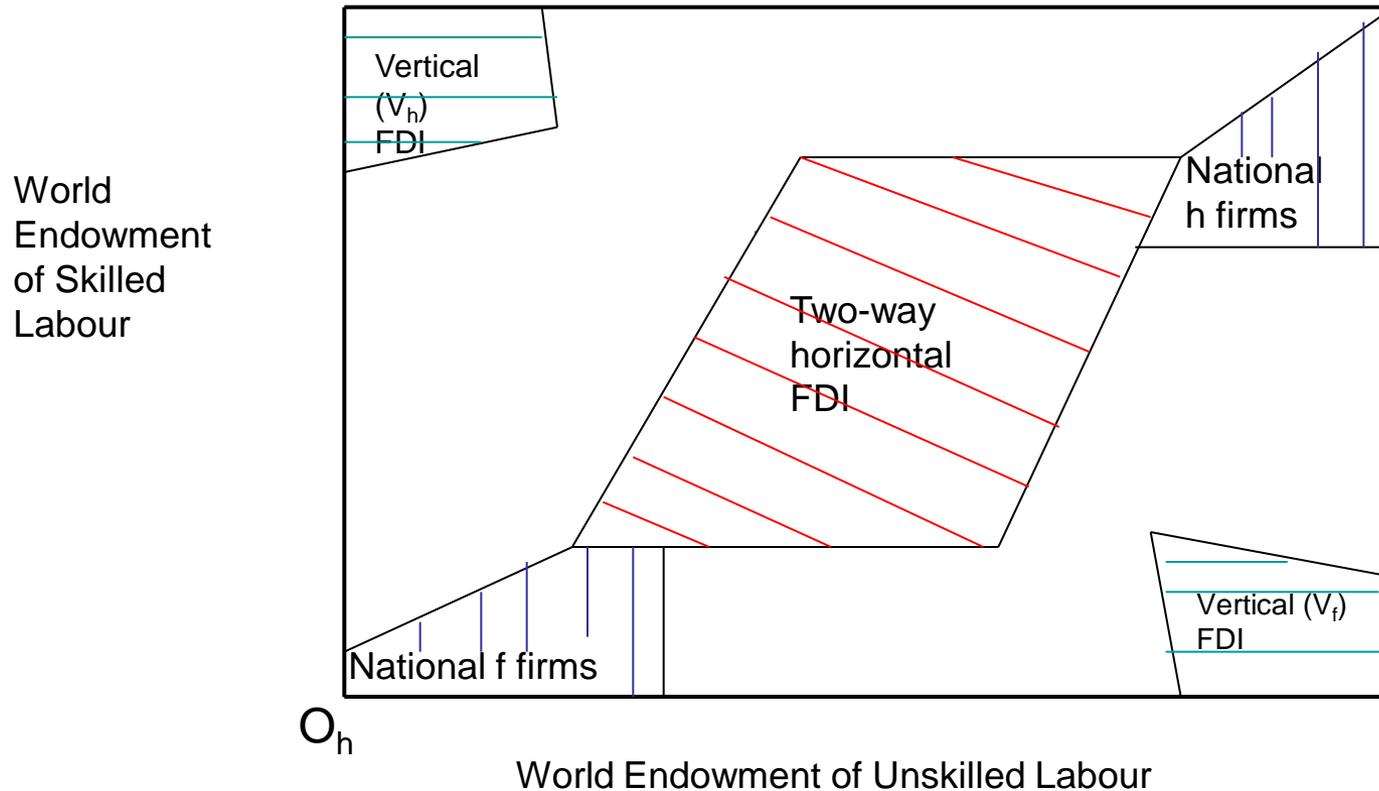
What does this predict? (i) between countries with relatively similar factor endowments, horizontal FDI; (ii) vertical FDI with countries with relatively dissimilar factor endowments

Recent research on this issue

- Early research by Carr *et el* (2005) focussed on a 'horse race' between the determinants-these were not direct observations on the form of FDI.

- Concluded that horizontal FDI dominated the world economy, that it existed mainly between developed countries and vertical FDI was associated with developed/developing country FDI

- More recent research takes a more direct look at the vertical linkages between parents and affiliates

- Alfaro and Charlton (2009) AER

- Ramondi *et al* (2014)

Our approach

- We fall into this category in making **direct** observations but in our case on the form that CBAs

- There are certain advantages to what we do:

…we have data on every CBA in the world economy

…we have disaggregate data at the 4 digit level

…we also have it over time (remember the booms in FDI)

…we highlight not only horizontal and vertical forms but also conglomerate acquisitions

Data & Method

- All firm-level CBA data (also domestic M&A data)-we have 4 digit SIC codes for each acquiring and target firm across all countries.

- Between 1990-2011, we have 165,000 cross-border deals

- For each acquiring and target firm, we have up to 6 (4 digit) SIC codes reported for each firm involved.

Identifying type

- Tying vertical relatedness with industry activity (similar to the approach by Alfaro and Charlton and Acemoglu *et al*)

- "Vertical relatedness" is based on Fan (2001/2006) which is identifies the extent to which industries are vertically-related based on US input:output tables. Specifically, they produce a **coefficient of vertical relatedness** based on the fraction of industry *a* that contributes to value added in industry *b* based on commodity flows between 500 industries

- We cross-match this coefficient of vertical relatedness with 4 digit SICs for each acquiring and target firm involved in CBAs. With each acquiring and target firm reporting up to 6 4 digit SIC codes, this gives us 36 possible combinations

Defining CBAs by Type

- **'Pure' Horizontal**: deals where the acquiring and target firms share at least one (4 digit) SIC code but are never vertically-related

- **'Pure' Vertical**: deals where firms do not share the same (at least one) SIC code but are vertically related

- **Conglomerate**: deals where firms do not share any SIC code and are not vertically related

- 'Mixed': deals where the do share a code and are vertically related

Figure 1: Industrial Composition of CBAs, All Deals (165,106 Deals)

Primary Sector   Manufacturing   Transport   Distribution   Finance   Services

Industry (SIC) of Acquiring Firm

Service

Finance

Distri-bution

Trans-port

Manu-facturing

Primary Sector

Industry (SIC) of Target Firm
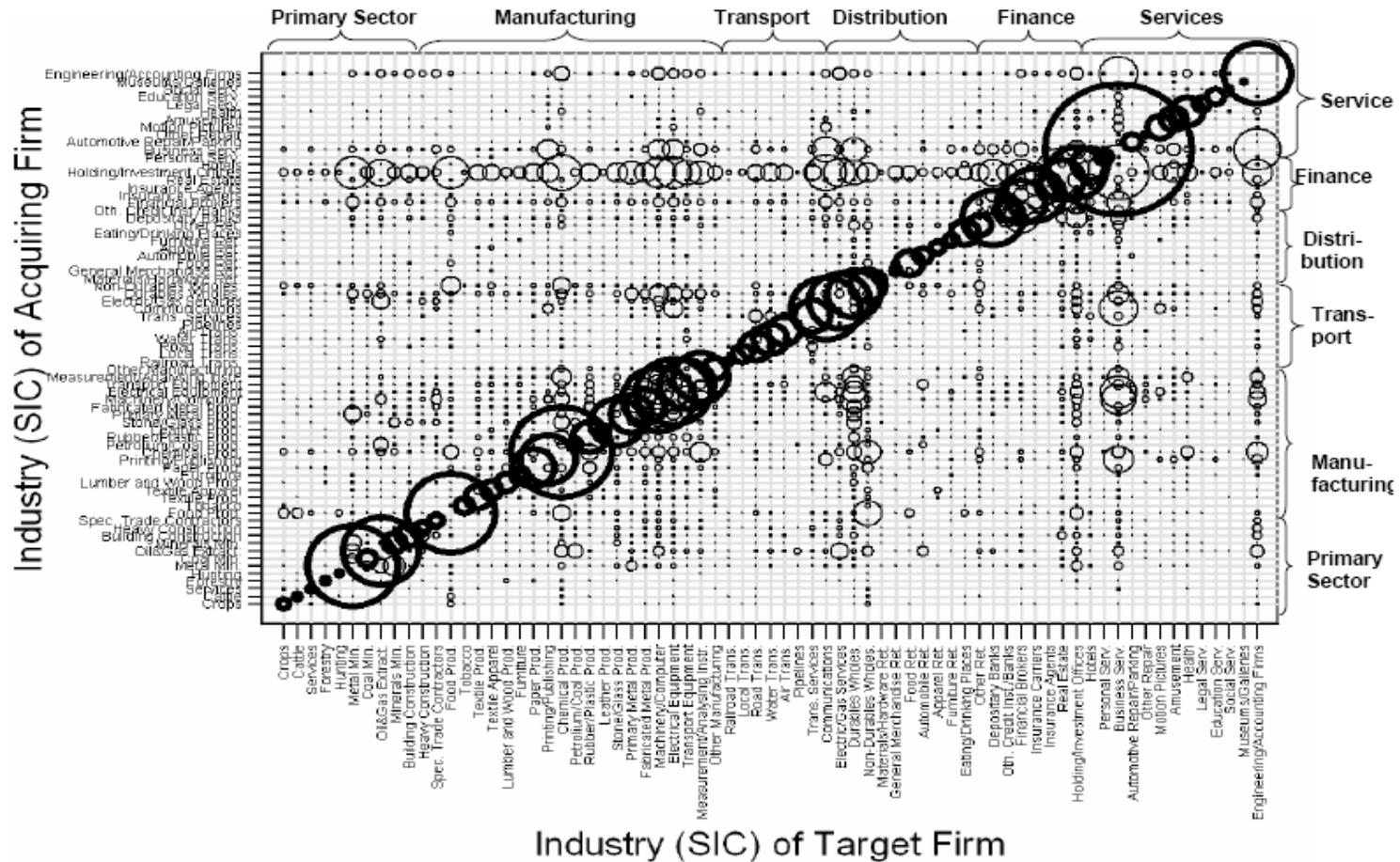
Data Source: SDC Platinum
Note: 5 % cutoff to define vertical relatendess

Table 3: Proportion of FDI Strategies across different values of $\overline{V}$

Cutoff ($\overline{V}$)	Pure Horizontal	Pure Vertical	Conglomerate	Residual
1%	8%	55%	20%	17%
5%	19%	24%	36%	21%
10%	35%	11%	44%	10%

Figure 2: Industrial Composition of Horizontal CBAs (31,771 Deals)

Industry (SIC) of Acquiring Firm

Industry (SIC) of Target Firm
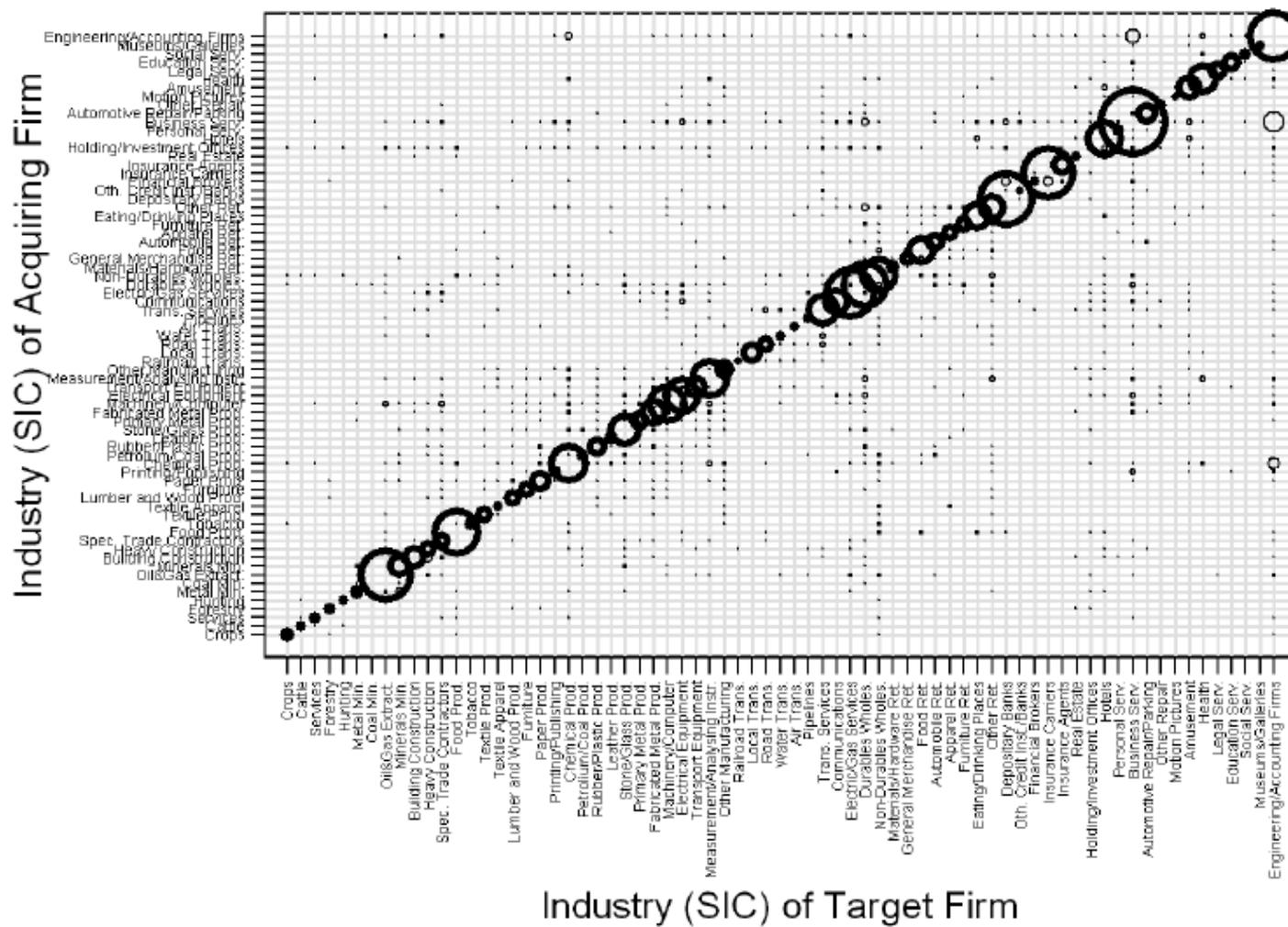
Data Source: SDC Platinum
Note: 5 % cutoff to define vertical relatendess

Figure 3: Industrial Composition of Vertical CBAs (40,093 Deals)

Industry (SIC) of Acquiring Firm

Industry (SIC) of Target Firm
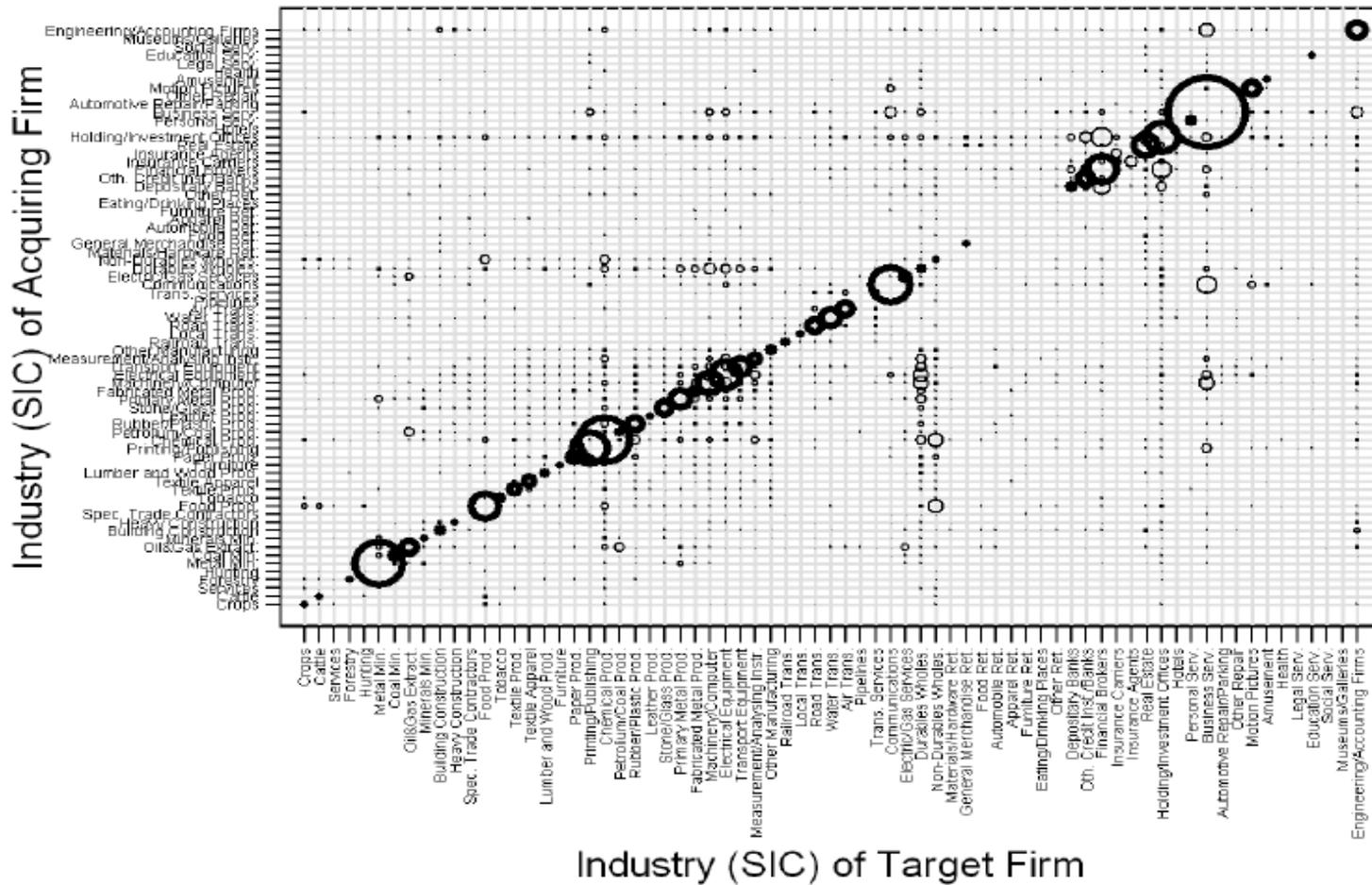
Data Source: SDC Platinum
Note: 5 % cutoff to define vertical relatendess

Figure 4: Industrial Composition of Conglomerate CBAs (58,816 Deals)

Industry (SIC) of Acquiring Firm

Industry (SIC) of Target Firm

Data Source: SDC Platinum
Note: 5 % cutoff to define vertical relatendess

Number of CBA Deals per Year

■ Horizontal Deals   ■ Vertical Deals   ☐ Conglomerate Deals   ☐ Residual
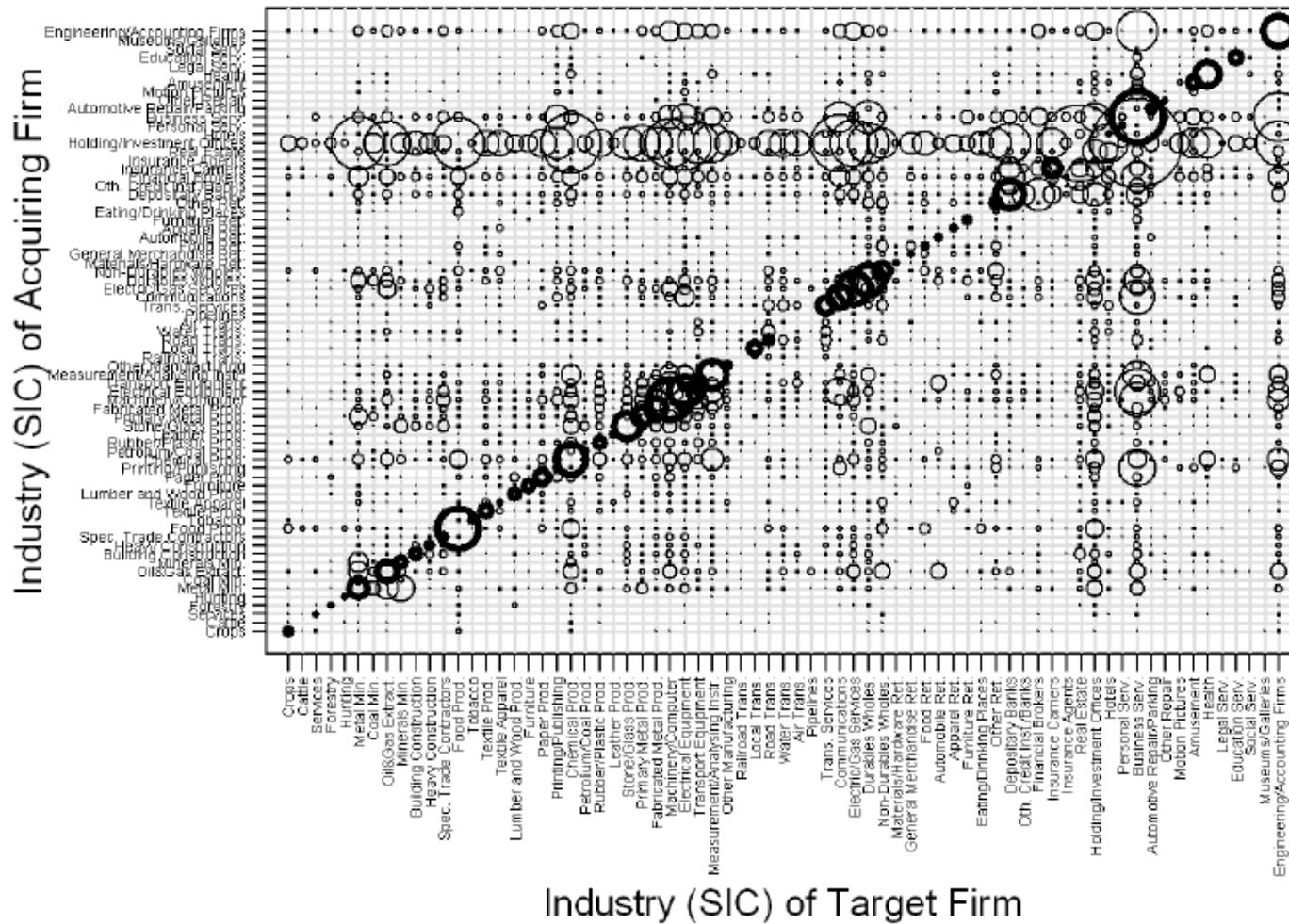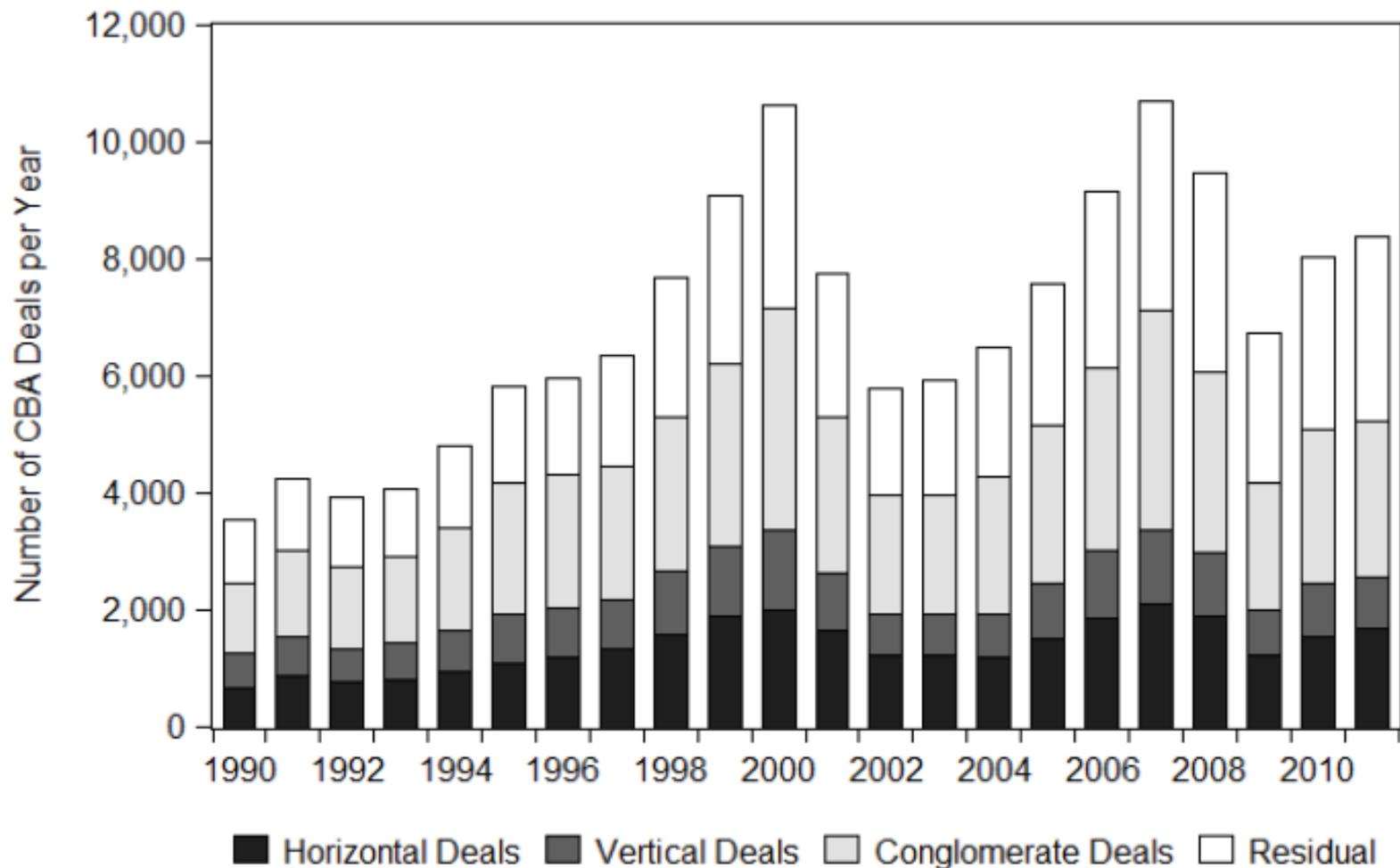
US CBAs Total and by Form. 1990-2011

Number of CBAs

Value CBAs
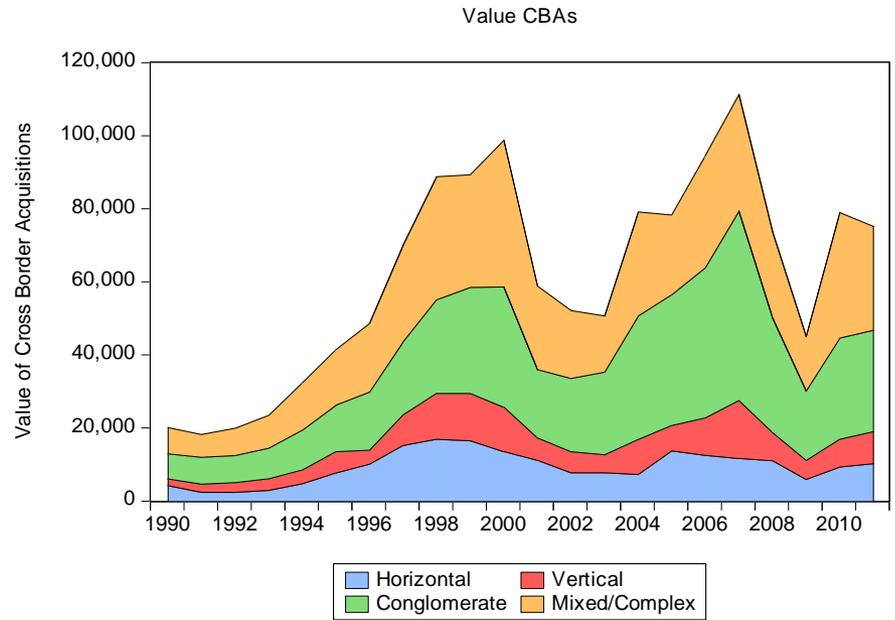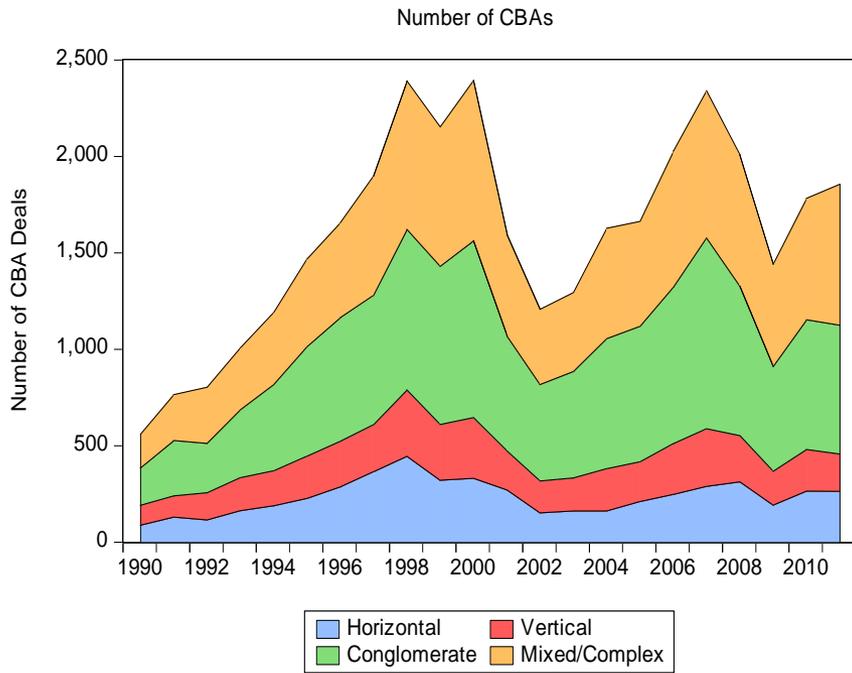
What do we learn from this?

- Horizontal less important than we assume

- Vertical CBAs/FDI are important between developed countries

- Vertical FDI can be divided into inter- and intra-industry FDI. With the dis-aggregated data, we get this insight which would not arise with more aggregate data

- These three points confirm Alfaro and Charlton (AER, 2009)..but what more do we learn?

- Despite the 'wave-like' features of FDI, horizontal and vertical FDI are relatively stable

- A large proportion of CBAs/FDI is conglomerate—we are particularly interested in this form

Econometric Approach

- We follow a location choice approach to the issue of firms locating in other countries via CBAs

- Panel (Poisson) count data model

- Since we can isolate horizontal, vertical and conglomerate CBAs, we can test directly what drives them

	All CBAs	Horizontal CBAs	Vertical CBAs	Conglomerate CBA
	(1)	(2)	(3)	(4)
GDP	0.011	0.075***	0.009	-0.029
	(0.018)	(0.024)	(0.023)	(0.021)
SWP	0.781***	0.283	1.030***	0.820***
	(0.156)	(0.193)	(0.209)	(0.185)
Distance	-1.101***	-1.253***	-1.035***	-1.114***
	(0.033)	(0.036)	(0.035)	(0.041)
Language	0.092***	0.104***	0.086***	0.094***
	(0.003)	(0.004)	(0.004)	(0.003)
CU	0.056***	0.008	0.052***	0.088***
	(0.009)	(0.012)	(0.009)	(0.011)
Trade Freedom	0.034	0.014	0.068	0.007
	(0.043)	(0.053)	(0.074)	(0.053)
Investment Fd.	0.008	-0.069	0.011	-0.040
	(0.080)	(0.087)	(0.107)	(0.108)
Corruption	-0.156**	-0.105	-0.099	-0.172**
	(0.063)	(0.070)	(0.076)	(0.086)
Corporate Taxes	-0.329***	-0.209**	-0.315***	-0.412***
	(0.085)	(0.097)	(0.096)	(0.104)
Exchange Rate	-0.438***	-0.511***	-0.455***	-0.427***
	(0.067)	(0.075)	(0.077)	(0.076)
Euro	0.006**	0.009***	0.010***	-0.001
	(0.002)	(0.003)	(0.003)	(0.003)
α_{st}	yes	yes	yes	yes
δ_h	yes	yes	yes	yes
#cba	126,481	24,133	36,334	45,251
#obs	25,446	25,446	25,446	25,446
$\ln L$	-49,116	-19,107	-22,967	-26,402

Robustness

	1 % for $\overline{V}$		10 % for $\overline{V}$	
	Horizontal CBAs	Vertical CBAs	Horizontal CBAs	Vertical CBAs
	(1)	(2)	(3)	(4)
GDP	0.117***	0.005	0.058***	-0.001
	(0.038)	(0.020)	(0.019)	(0.031)
SWP	0.290	0.915**	0.629***	1.054***
	(0.320)	(0.207)	(0.189)	(0.298)
Distance	-1.347***	-1.073***	-1.203***	-0.949***
	(0.054)	(0.037)	(0.038)	(0.045)
Language	0.104***	0.090***	0.102***	0.066***
	(0.005)	(0.003)	(0.003)	(0.005)
CU	0.015	0.059***	0.015	0.053***
	(0.013)	(0.009)	(0.010)	(0.011)
Trade Freedom	-0.004	0.031	0.051	0.055
	(0.072)	(0.046)	(0.040)	(0.117)
Investment Fd.	-0.102	0.051	-0.0002	0.088
	(0.134)	(0.088)	(0.091)	(0.170)
Corruption	-0.093	-0.132**	-0.153**	-0.105
	(0.088)	(0.068)	(0.065)	(0.097)
Corporate Taxes	-0.511***	-0.354***	-0.347***	-0.130
	(0.122)	(0.087)	(0.088)	(0.134)
Exchange Rate	-0.501***	-0.453***	-0.543***	-0.388***
	(0.103)	(0.068)	(0.066)	(0.084)
Euro	0.013***	0.005*	0.007**	0.014***
	(0.004)	(0.003)	(0.00*)	(0.004)

Addressing Conglomerate FDI

- Drawing on the finance literature, is it valuation that is driving the fluctuations in CBAs?

- Recall the waves in FDI/CBAs and the role that conglomerate FDI plays

- In this context, is it mis-pricing/over-valuation that is driving this?

- Erel *et al.* (2011) address this with reference to total CBAs but we do it by type (see also Baker *et al RFStud*, 2009)

Separating mis-pricing from fundamentals

- Our data is at the firm level so we can create data on market-to-book ratios for each of the publically-traded firms

- From this, we can aggregate to a country level market-to -book ratio (though this reduces our country coverage)
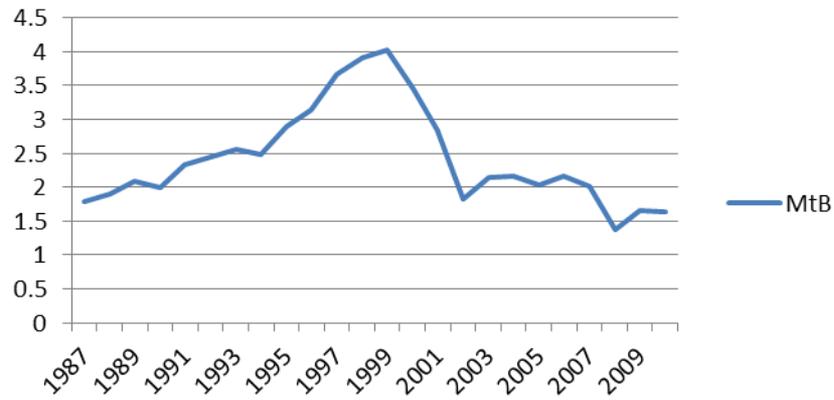$$MTB_{it} = \alpha_0 + \alpha_1 R_{t+1}$$

- The main idea is that we instrument for mis-pricing: if the ex ante MTB ratio exhibits short-run mis-pricing, it should be corrected next period.

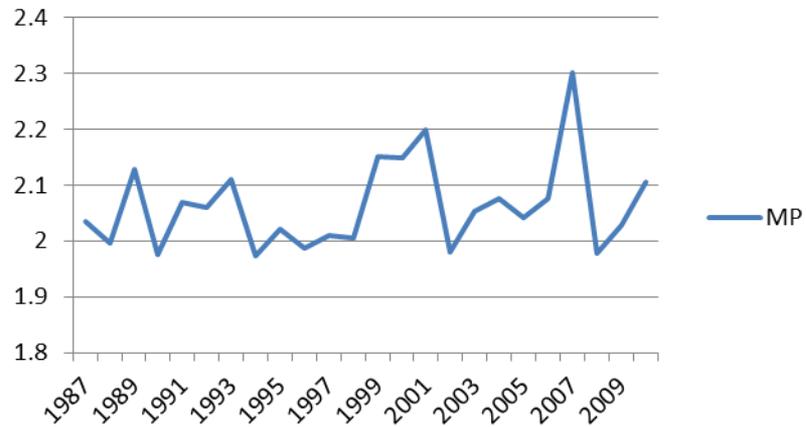If there is mis-pricing in the current period, this should revert in the next, so $\alpha_1 < 0$

Fitted values for this, give the mis-pricing effect; the residual is the wealth effect

MtB

MP

	All CBA	Horizontal CBA	Vertical CBA	Conglomerate CBA
	(1)	(2)	(3)	(4)
GDP	-0.005	0.130**	0.031	-0.138**
	(0.045)	(0.061)	(0.055)	(0.051)
SWP	0.201***	0.176*	0.284***	0.165*
	(0.060)	(0.090)	(0.080)	(0.085)
Distance	-0.883***	-0.964***	-0.858***	-0.904***
	(0.037)	(0.048)	(0.036)	(0.041)
Language	0.160***	0.179***	0.157***	0.157***
	(0.005)	(0.007)	(0.006)	(0.006)
CU	0.127***	0.069*	0.086***	0.190***
	(0.028)	(0.027)	(0.030)	(0.030)
Trade Freedom	-0.496	0.543	-0.571	-0.955*
	(0.550)	(0.714)	(0.649)	(0.525)
Investment Fd.	0.040	-0.232	0.113	0.078
	(0.148)	(0.185)	(0.154)	(0.174)
Corruption	0.057	0.096	0.132	-0.012
	(0.102)	(0.137)	(0.109)	(0.104)
Corporate Taxes	-0.273*	-0.145	-0.131	-0.381**
	(0.141)	(0.155)	(0.135)	(0.156)
Exchange Rate	-0.626***	-0.725***	-0.841***	-0.512**
	(0.178)	(0.184)	(0.213)	(0.217)
Euro	0.026***	0.039***	0.036***	0.011
	(0.007)	(0.008)	(0.009)	(0.009)
MtB^m	0.929*	0.769	0.533	1.318**
	(0.496)	(0.537)	(0.457)	(0.647)
MtB^w	0.0001	0.0005	-0.0001	0.00002
	(0.0004)	(0.0004)	(0.0004)	(0.000)
Shareh. Rights	0.138***	0.115**	0.176***	0.135**
	(0.045)	(0.053)	(0.056)	(0.056)

So what?

- The world of FDI as it is reflected in CBAs is more complex than standard models that have been used to date

- A large part of what we observe (e.g. vertical deals between developed countries doesn't fit the standard case)

- Conglomerate FDI is a big part of the story

- ..it helps explain the volatility in FDI but it is not necessarily driven by 'real' factors

Why does this matter?

- FDI is favoured over other forms of capital flows because of its relative stability-this is true but only up to a point

- Potential benefits of FDI-they likely exist but are will not be reflected in everything we observe in FDI/CBA flows

- What are the benefits of conglomerate FDI? (management/core competencies?) Does it matter for innovation and competitiveness?

The Food Sector

- Sexton (2000) comments that mergers and acquisitions and changes in the extent of market concentration has been one of the most notable features of structural changes in the food sector worldwide

- What form does CBAs in the food sector take?

- Does this carry over to domestic acquisitions?

Food Industry CBAs

Acquirer Industry (2-Digit SIC)

Engineering/Accounting
Museums/Galleries
Social Services
Education
Legal Services
Health
Amusement
Motion Pictures
Other Retail
Automotive Repair Parking
Business Services
Personal Services
Hotels
Real Estate
Holding and Investment
Insurance Agents
Insurance Carriers
Financial Brokers
Other Credit Inst./Banks
Depository Banks
Eating and Drinking Places
Furniture Retailing
Apparel Retailing
Automobile Retailing
General Merchandise Retailing
Materials/Hardware Retailing
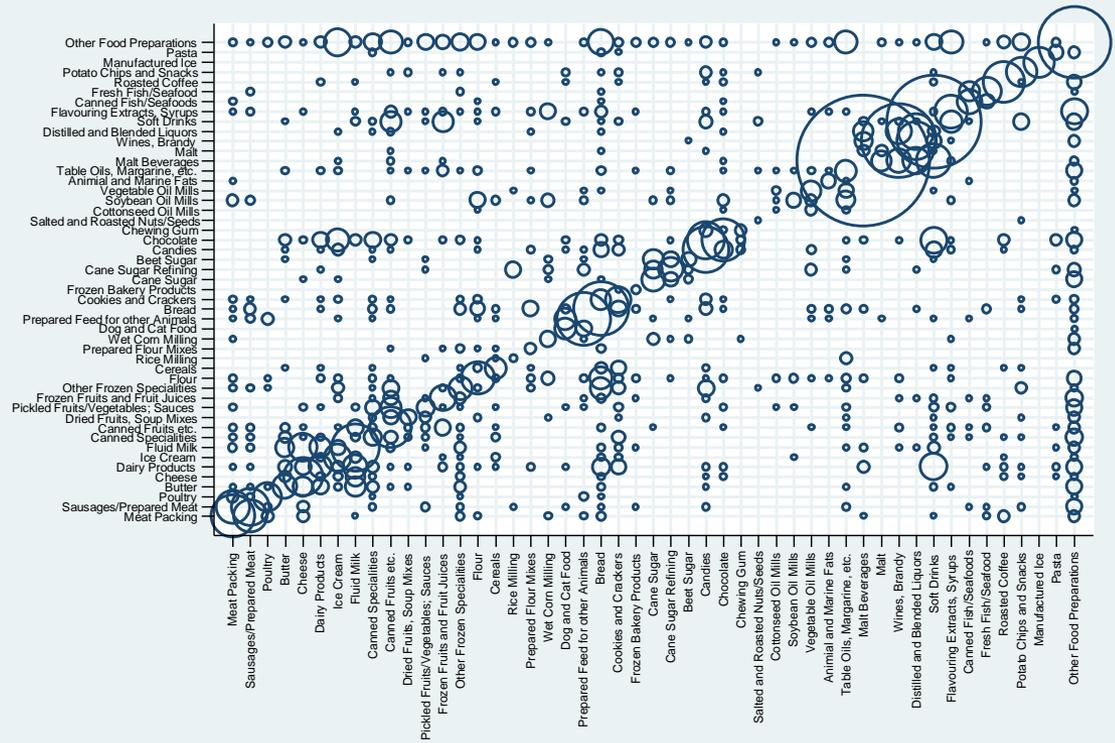Non-Durables Wholesaling
Durables Wholesaling
Electric/Gas Services
Transportation Services
Utilities
Air Transportation
Water Transportation
Road Transportation
Rail Transportation
Other Manufacturing
Measurement Analysing Instruments
Electrical Equipment
Machinery/Equipment
Fabricated Metal Prod.
Primary Metal Prod.
Stone/Glass Prod.
Paper Prod.
Rubber and Plastic Prod.
Petroleum/Coal Production
Chemical Production
Printing/Publishing
Paper Production
Lumber and Wood Production
Textile Apparel
Textile Production
Tobacco
Food Production
Heavy Construction
Building Construction
Minerals Mining
Oil and Gas Extraction
Coal Mining
Metal Mining
Forestry
Agri Services
Cattle
Crops

Target Industry (2-Digit SIC)

Engineering/Accounting
Museums/Galleries
Social Services
Education
Legal Services
Health
Amusement
Motion Pictures
Other Retail
Automotive Repair Parking
Business Services
Personal Services
Hotels
Real Estate
Holding and Investment Offices
Insurance Agents
Insurance Carriers
Financial Brokers
Other Credit Inst./Banks
Depository Banks
Eating and Drinking Places
Furniture Retailing
Apparel Retailing
Automobile Retailing
General Merchandise Retailing
Materials/Hardware Retailing
Non-Durables Wholesaling
Durables Wholesaling
Electric/Gas Services
Transportation Services
Utilities
Air Transportation
Water Transportation
Road Transportation
Rail Transportation
Other Manufacturing
Measurement Analysing Instruments
Electrical Equipment
Machinery/Equipment
Fabricated Metal Prod.
Primary Metal Prod.
Stone/Glass Prod.
Paper Prod.
Rubber and Plastic Prod.
Petroleum/Coal Production
Chemical Production
Printing/Publishing
Paper Production
Lumber and Wood Production
Textile Apparel
Textile Production
Tobacco
Food Production
Heavy Construction
Building Construction
Minerals Mining
Oil and Gas Extraction
Coal Mining
Metal Mining
Forestry
Agri Services
Cattle
Crops

42% 29%
10% 19%

**Inter-Industry
CBAs of Food Firms**

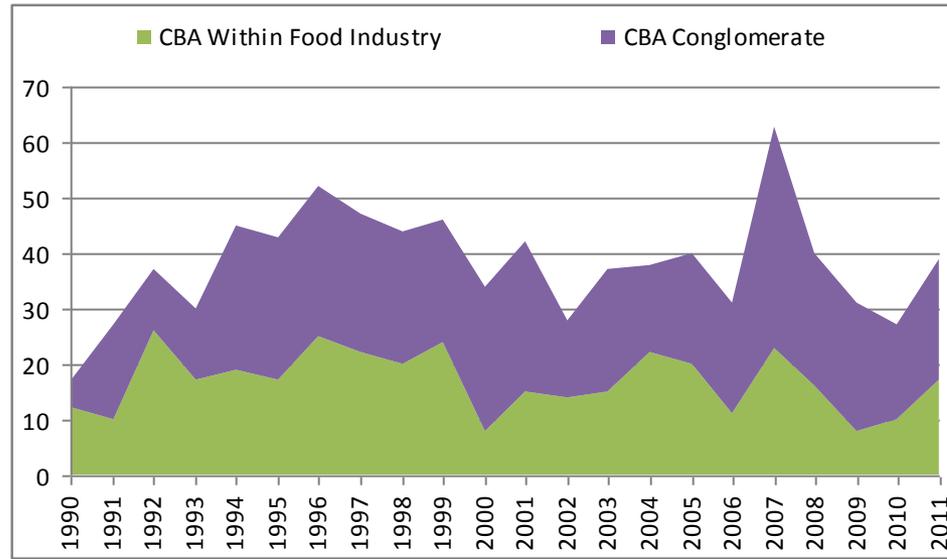**Intra-Food**

**Inter-Industry
CBAs by Food Firms**

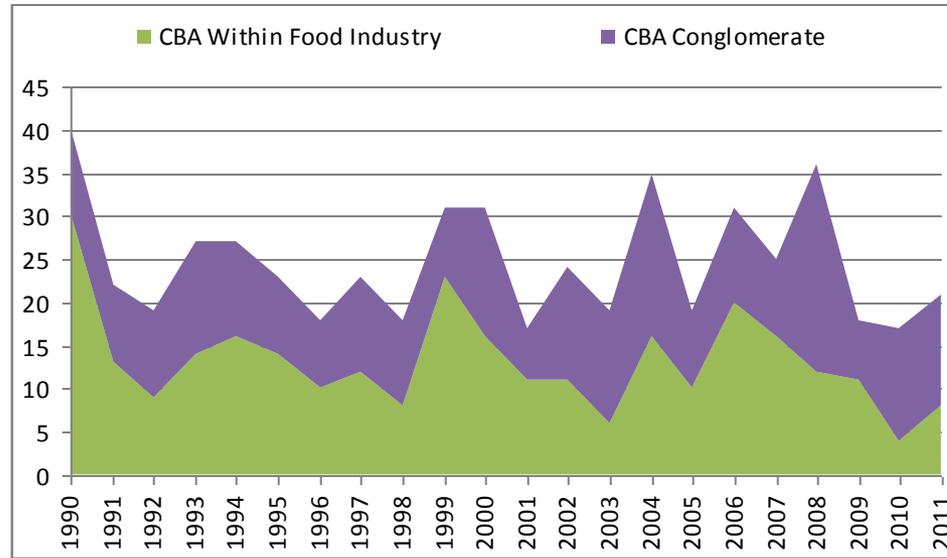Data Source: SDC Platinum
Note: 5 % cutoff to define vertical relatendess
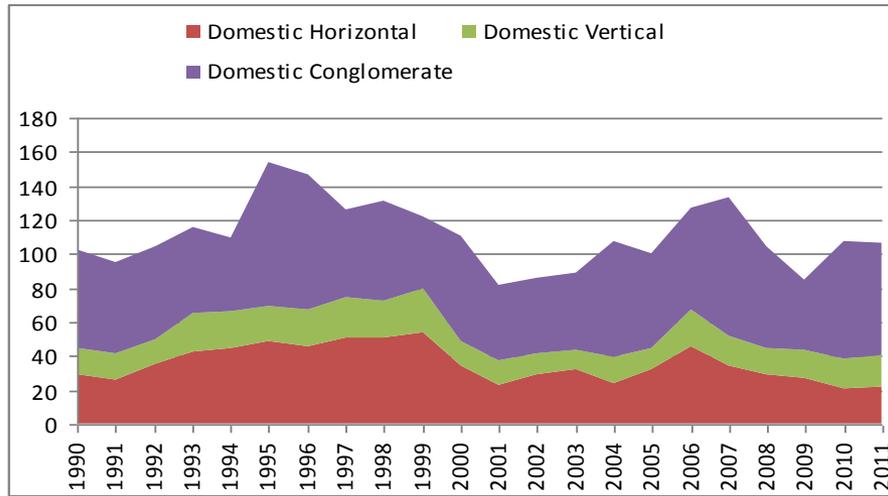
Industry (SIC) of Target Firm
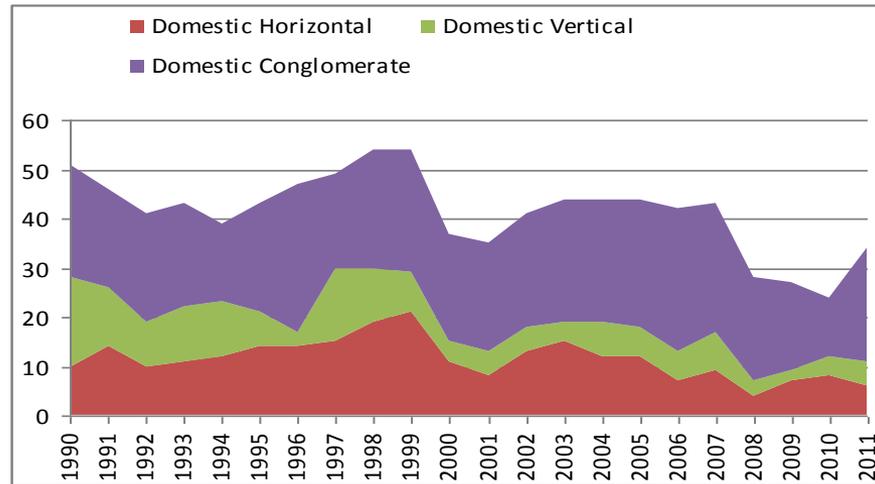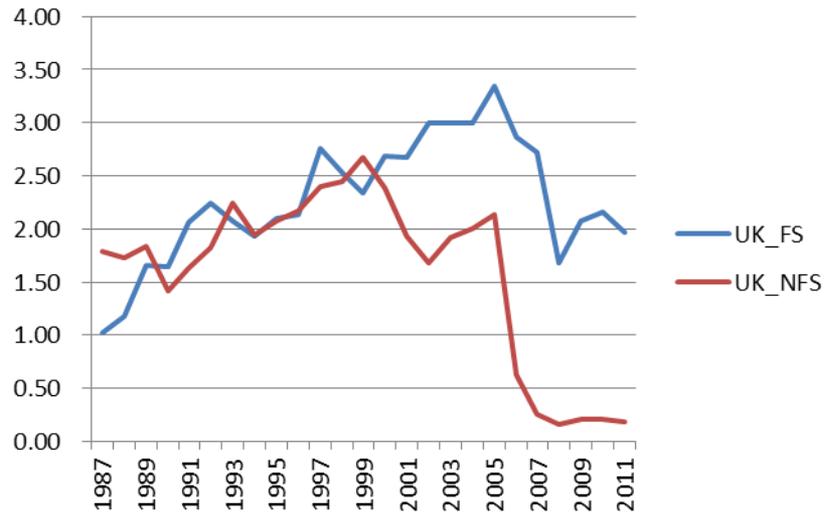
Data Source: SDC Platinum

US

UK

US
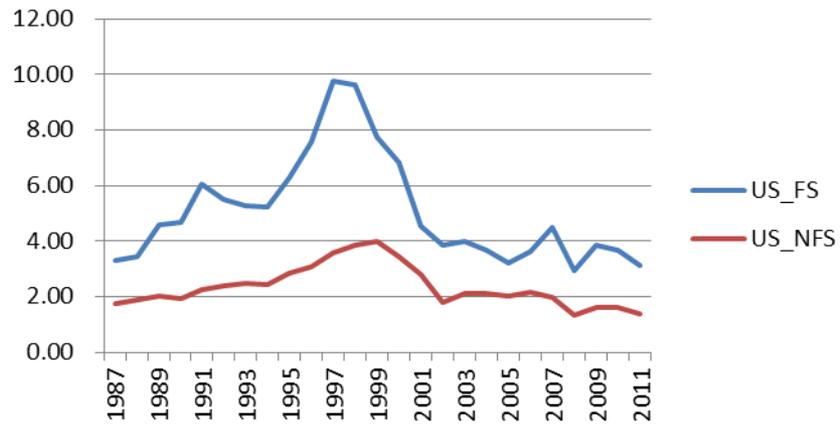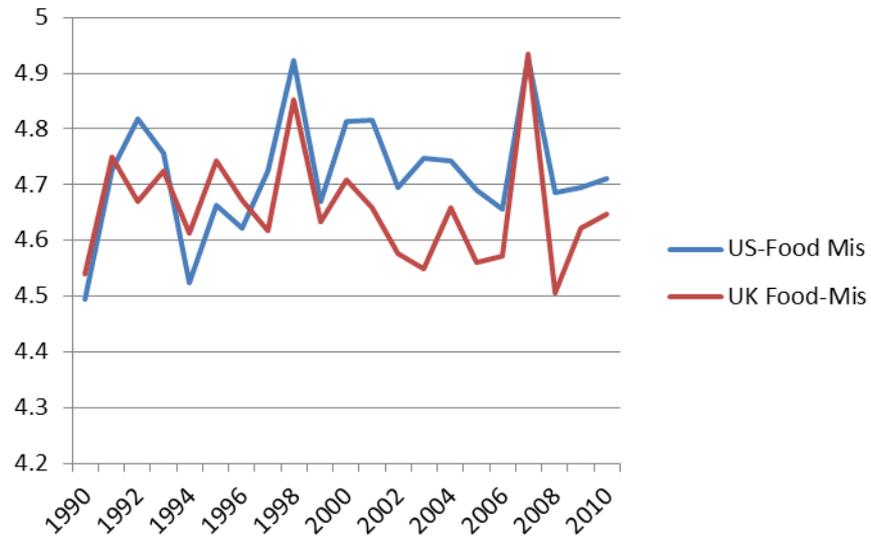

UK

Market-to-Book Ratios: US & UK; Food and Non-Food Sectors

Preliminary Results

		Food Industry			
				Inter Industry Deals	
	All CBAs	All	Intra-Industry	Food Firm is Acquirer	Food Firm is Target
GDP	-0.033	0.031	0.037	0.064	-0.039
	(0.037)	(0.115)	(0.127)	(0.196)	(0.223)
Wage Difference	-0.259**	-0.513*	-0.154	-1.076*	-0.578
	(0.123)	(0.360)	(0.398)	(0.643)	(0.641)
Distance	-0.967***	-1.435***	-1.664***	-1.490***	-1.128***
	(0.050)	(0.202)	(0.259)	(0.227)	(0.252)
Language	0.182***	0.215***	0.224***	0.157***	0.255***
	(0.006)	(0.016)	(0.019)	(0.028)	(0.036)
Investment Freedom	0.112	0.462	0.662	-0.284	0.68
	(0.175)	(0.323)	(0.442)	(0.715)	(0.638)
Trade Freedom	-0.028	-0.504	0.274	3.627	-5.910***
	(0.546)	(1.150)	(1.597)	(3.166)	(2.108)
Corporate Taxes	-0.126	-0.285	0.25	-1.621***	-0.740
	(0.107)	(0.323)	(0.355)	(0.507)	(0.695)
EU	-0.117**	-0.263	-0.445*	-0.700**	0.364
	(0.046)	(0.189)	(0.260)	(0.337)	(0.259)
EURO	0.017*	-0.053*	-0.032	-0.054	-0.075
	(0.011)	(0.031)	(0.035)	(0.062)	(0.062)
Exchange Rate	-0.907***	-1.142**	-1.076*	-1.352	-0.631
	(0.229)	(0.471)	(0.572)	(0.885)	(0.950)
MTB(Mispricing)	0.818***	0.639	-0.343	0.648	3.293**
	(0.151)	(0.932)	(1.291)	(1.724)	(1.690)
MTB(Wealth Effect)	0.0004	-0.001	-0.001	-0.004	0.001
	(0.0004)	(0.001)	(0.001)	(0.003)	(0.002)

Research Questions

- What are the characteristics of the firms involved in acquisitions? Are they likely to be of benefit? Does it depend on the form they take?

- Are conglomerate CBAs/DMAs another form of financialisation in the food sector or do they bring benefits (better management)?

- Are they likely to be of benefit? Does it depend on the form they take?

- Are DMA and CBAs driven by exogenous factors? Is the restructuring in the industry a response to outside factors? Commodity price volatility/trade policy?