

Future Direction for the International Accounts

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Presentation to the BEA Advisory Committee

May 14, 2021



- Refresher on past globalization topics
- Update on Trade in Services Initiative
- Overview of current research involving multinational enterprises
- Work in focus: Extended supply and use tables
- The way forward
- Questions for discussion

Selected past presentations on globalization



- **Nov 2019:** Update on Trade in Services Initiative
- **Nov 2018:** Offshore Profit Shifting of MNEs via Strategic Movement of Intellectual Property
- **Nov 2015:** Update on New Measurements of the Impacts of Globalization: Identifying firm heterogeneity using extended supply and use tables
- **Nov 2014:** Global Value Chains and Factoryless Goods Manufacturing
- **May 2013:** Updates on Measuring the Effect of Globalization: Price Biases, Factoryless Manufacturing, and Value-Added Estimates
- **May 2011:** Global Manufacturing and Issues Raised by the iPhone: Misleading bilateral trade data

- 2020 enhancements

- Accelerated release of most detailed annual statistics by country and type of service
- Expanded type of service detail for quarterly and annual statistics
- Expanded geographic detail in quarterly statistics
- Published two new interactive data tables for easier access to statistics by type/by geography and by geography/by type

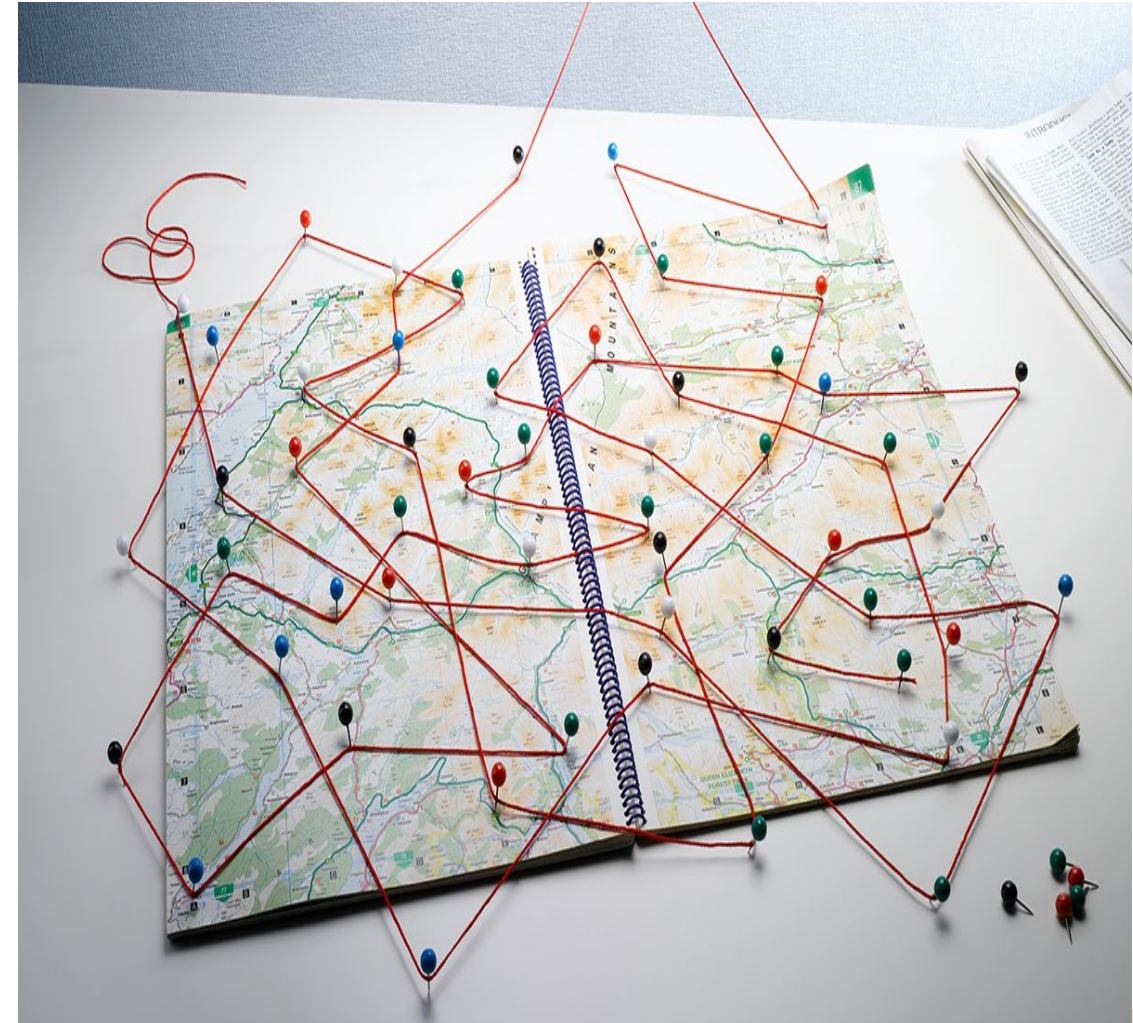
- Current research for future enhancements

- Type of service by industry
- Exports by state
- Digital trade

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The Rise of Phantom Investments

Empty corporate shells in tax havens undermine tax collection in advanced, emerging market, and developing economies



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- Geography of MNEs
 - Where does outward FDI really go?
 - Special purpose entities clouding the picture
 - Pass-through capital and ultimate host country
 - Subnational measures of MNE operations
 - Employment and wages of foreign-owned businesses in the United States
 - U.S. exports of services by state
- Global value chains (GVCs)
 - Trade in manufacturing services (processing trade)
 - Intellectual property (IP) in GVCs
 - Extended supply and use tables/trade in value added

Extended Supply and Use Tables

What can we learn about firm heterogeneity from an ownership view?

Supply and Use Tables (SUTs)

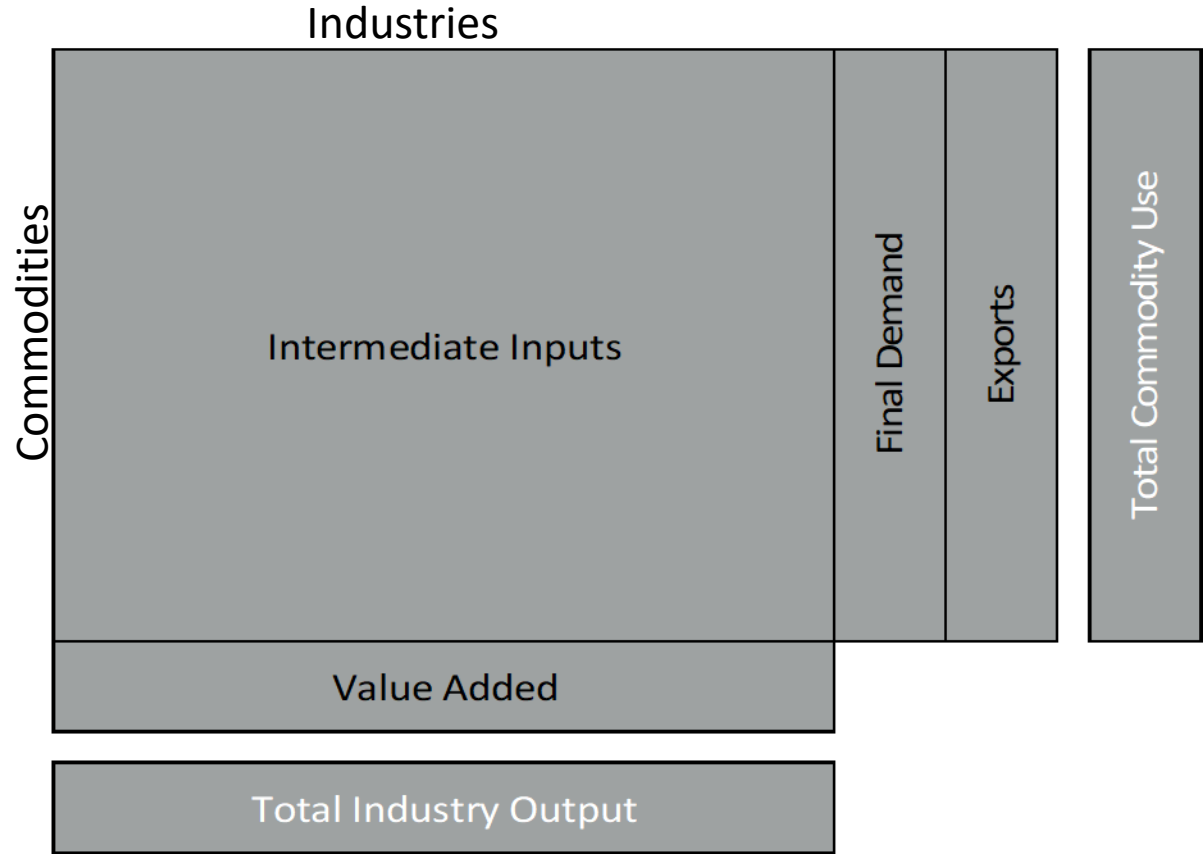
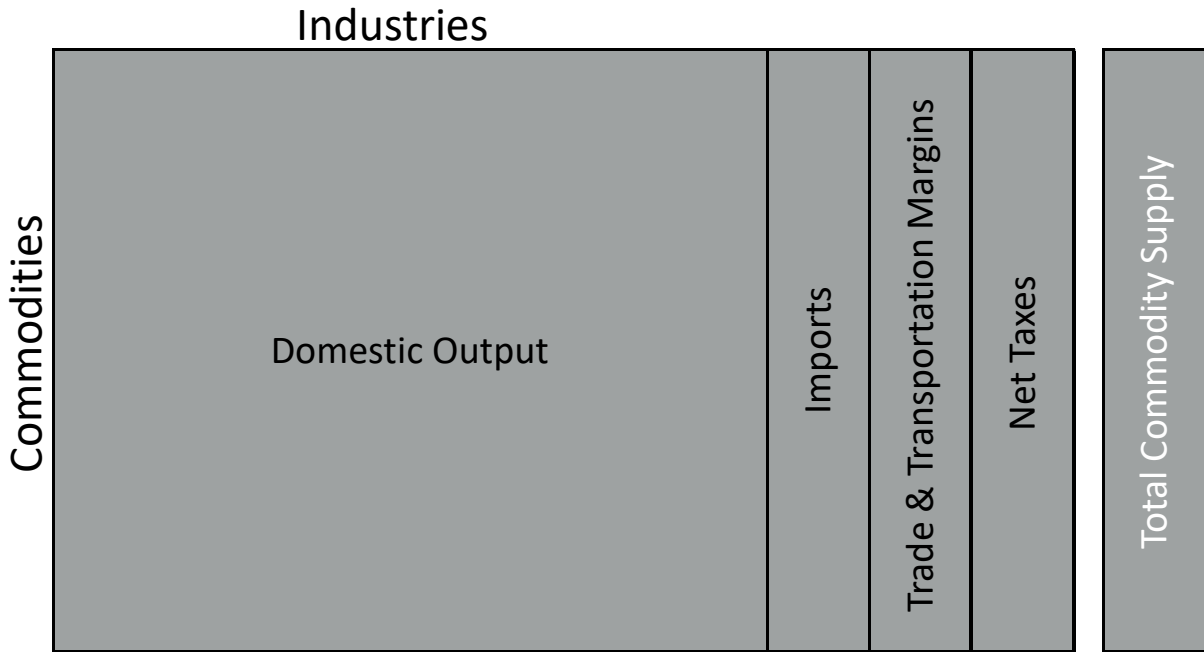
- **Supply table** shows the goods and services available in the U.S. economy



- **Use table** shows how the supply of goods and services is used



Supply and Use Tables (SUTs)



- I-O account statistics can be used to analyze questions such as
 - Which industries are growing and shrinking?
 - How do industries interact with each other?
 - How much does each industry contribute to the nation's economic growth?
- The I-O framework feeds into other analytical tools such as
 - Trade in Value Added (TiVA) statistics
 - Computable general equilibrium models
 - Regional impact analysis models
- Used as a key building block in GDP estimates

- Extended SUTs account for important intra-industry differences in firm characteristics, such as ownership type, export orientation, and firm size
- Current focus of ESUT research at BEA is on ownership by multinational enterprises (MNEs)

	Industry 1			Industry 2		
	U.S. Parent	U.S. Affiliate	Other Domestic	U.S. Parent	U.S. Affiliate	Other Domestic
Commodity 1						
Commodity 2						

- Yield insights about MNEs such as their contributions and relationships in supply chains
 - What upstream jobs are supported by production of MNEs vs. non-MNEs?
 - How would a foreign-owned auto manufacturer's decision to locate within the U.S. impact upstream industries like tire manufacturing?
 - What is the domestic content of production by MNEs vs. non-MNEs?
 - How do MNEs and non-MNEs contribute to U.S. economic growth?

- More accurate statistics in the GVC and TiVA contexts

Underlying Assumptions

- The standard SUT presentation makes a ‘representative establishment’ assumption within industries.
- Intra-industry differences between establishments are fine if they are not correlated with the variables or outcomes being studied.
- In the GVC and TiVA contexts, where the outcomes being studied are trade, behavior of establishments is expected to vary in a way that correlates with their engagement in foreign trade activity.
- Extended SUTs apply the ‘representative establishment’ assumption separately for each firm type.



- An OECD expert group is currently developing a Handbook on Extended Supply and Use Tables
- BEA research has focused on two broad approaches. Both start from previously constructed SUTs
 - *Experimental approach* allocates the original table values based on aggregate enterprise-level employment ratios from other source data (prior focus)
 - *Microdata approach*, to the extent possible, allocates the original table values based on ratios derived from underlying establishment-level microdata used in constructing the original table (current focus)

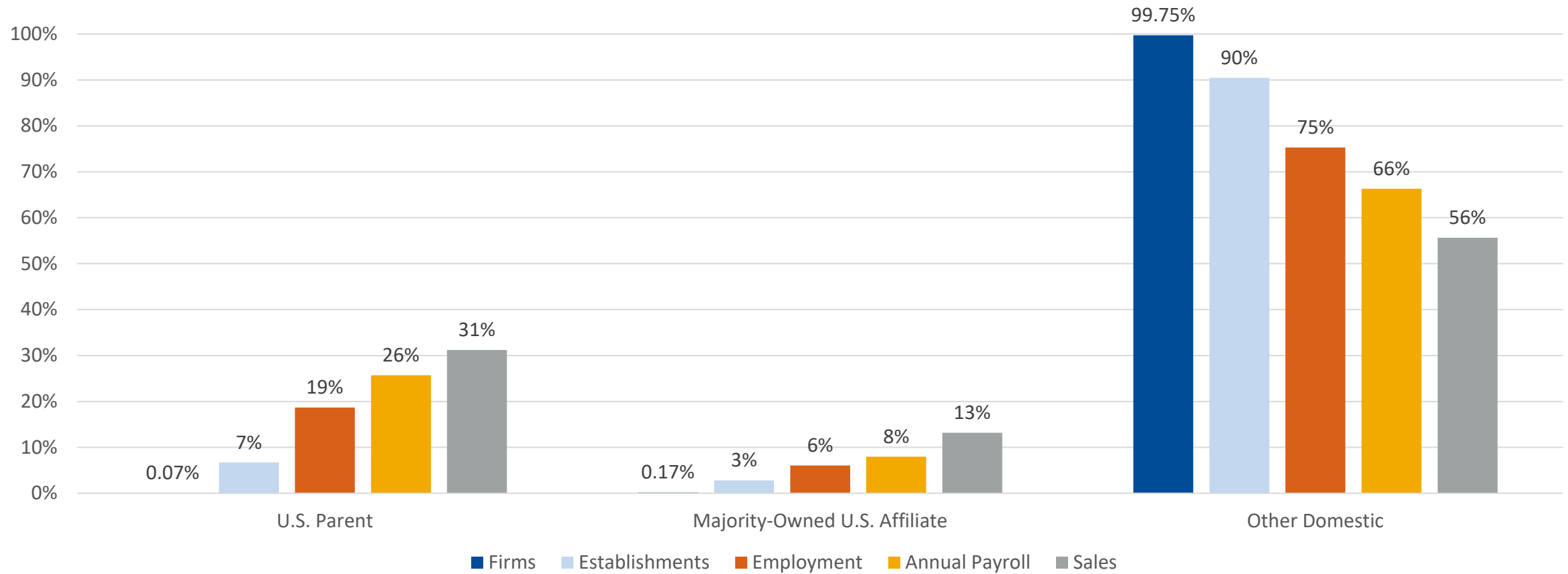
Why Focus on MNEs?

- Empirical and theoretical research suggests important differences in productivity between MNEs and non-MNEs (e.g., Melitz 2003 ‘productivity sorting hypothesis’)
- MNEs are more globally engaged and account for larger shares of trade than non-MNEs



MNEs Play an Important Role in the U.S. Economy

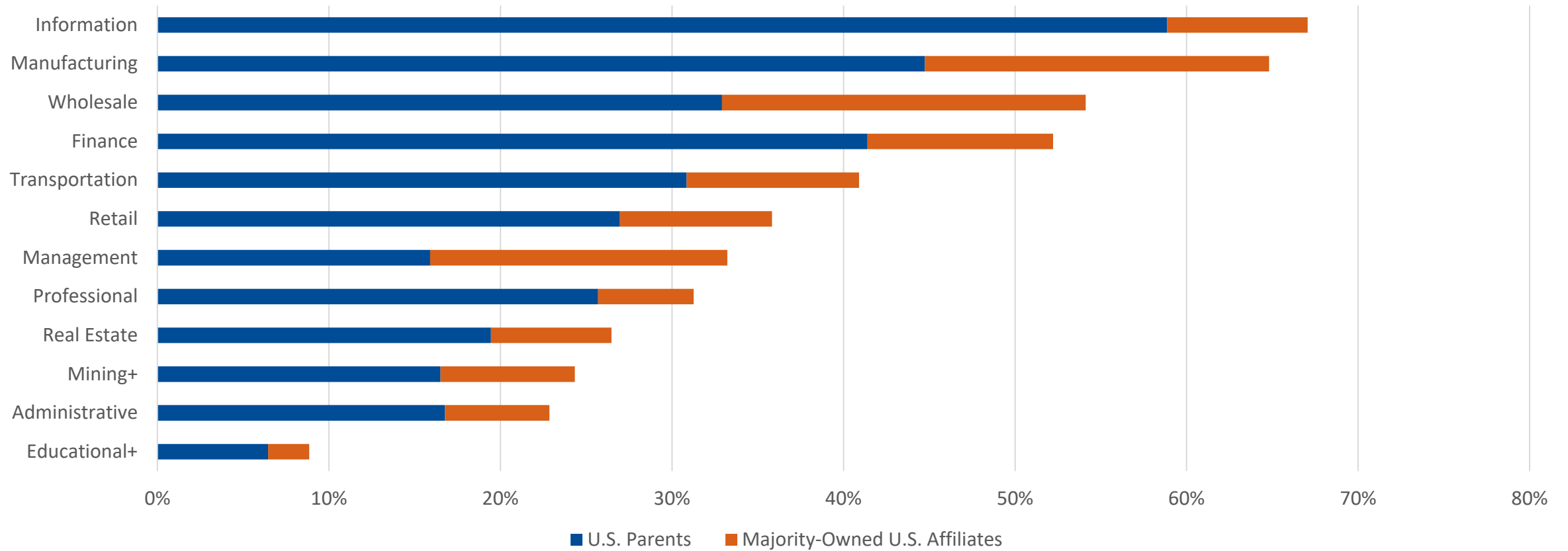
Shares of Domestic Economic Activity, 2012



Source: Kamal, McCloskey, and Ouyang (2021). Data from 2012 Economic Census.

Variation in Shares of Sales by Sector

MNE Share of Sales by Sector Group, 2012

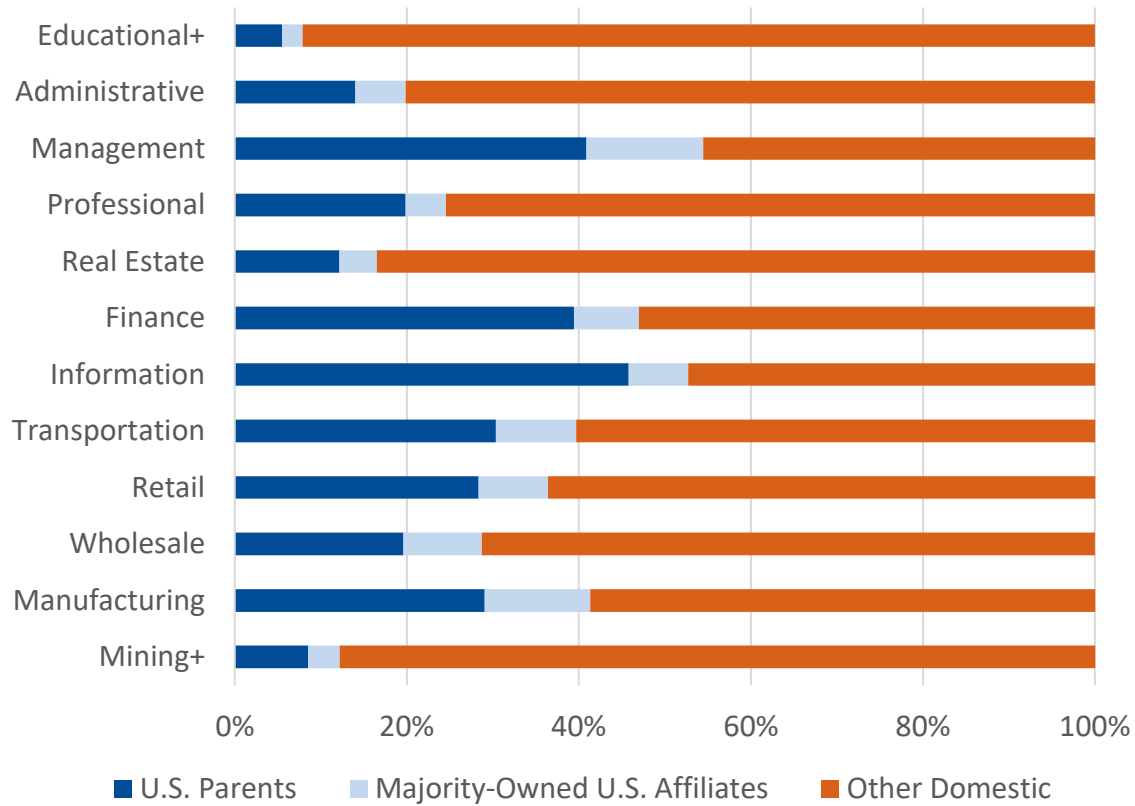


- Prior BEA ESUT research (Fetzer et al.) confirms interesting heterogeneities waiting to be discovered, for example
 - MNEs clearly dominate trade activity in gross exports, consistent with prior research and expectations
 - But non-MNEs make significant contributions to the value added embodied in those exports through production supply chains
 - And there's heterogeneity in contributions to export supply chains by industry and by part of the supply chain
- Experimental approach was faster to implement, but requires more assumptions and may not yield as robust results
 - Reliance on enterprise-level employment shares
 - Questions about whether surprising results may be a function of methods?

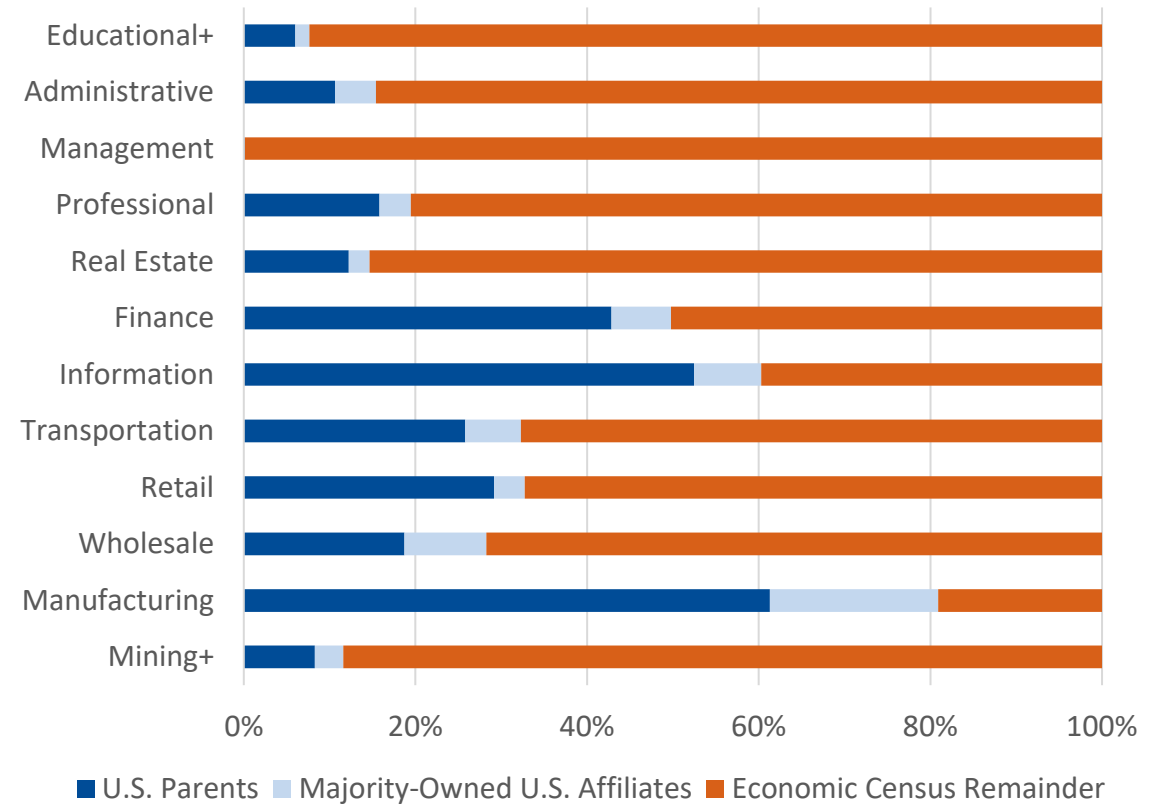
Establishment and Enterprise Based Shares Differ

Share of Employment by Sector, 2012

Establishment-Based



Enterprise-Based



Source: Kamal, McCloskey, and Ouyang (2021). Note: Enterprise-based numbers include some firms in both U.S. parent and U.S. affiliate totals. As a result, combined multinational totals are overstated. Enterprise-based U.S. affiliate employment for the management sector is included in educational+.

Building an ESUT from the Bottom Up



- Long-term project lead by Census researchers linked *BEA survey records* spanning two decades to the Census Business Register
- Preliminary links have been user-tested and refined. High quality version currently available
 - Employment weighted match rates greater than 95% in most years
 - Highly consistent with prior clerical linking (over 99% match consistency with 2010 BRDIS links)
- Work on finalized version currently underway
 - Expanding year coverage
 - Integrating machine learning models (performing clerical linking to expand training and testing data)

Disaggregating Three Broad Categories of SUT Inputs

1. *Census establishment-level business survey data*

- Accounts for the largest share of source data
- Process is to replicate the original data then tabulate it using our firm type classifications
- Can be challenging but we have been highly successful at doing this

2. *Goods and services international trade data*

- Important part of the use table
- Similar process for breaking down original source data but additional methods required for distributing firm records to establishments
- Prior work suggests this can also be challenging

3. *Other sources, adjustments, and original balancing values*

- Accounts for a smaller share of the data needed
- Here we need to identify alternative sources and/or ratios to allocate original values
- Should be simple

A Real Supply Table Column

Commodities	Radio and Television Broadcasting (515100)
Power and communication structures	12
All other retail	10
Motion picture and video industries	134
Sound recording industries	14
Radio and television broadcasting	22,193
Cable and other subscription programming	920
Custom computer programming services	48
Scientific research and development services	720
Advertising, public relations, and related services	50,438
Electronic and precision equipment repair and maintenance	4
Total Industry Supply	74,493

Source: BEA 2012. Millions of dollars.

A Supply Table Column by Data Source

Commodities	Radio and Television Broadcasting (515100)	Data Source	
Power and communication structures	12	Imputations, adjustments, and other sources	12
All other retail	10	Economic Census product lines	37
		Imputations, adjustments, and other sources	-27
Motion picture and video industries	134	Economic Census product lines	134
Sound recording industries	14	Economic Census product lines	14
Radio and television broadcasting	22,193	Economic Census product lines	11,555
		Imputations, adjustments, and other sources	10,638
Cable and other subscription programming	920	Economic Census product lines	920
Custom computer programming services	48	Imputations, adjustments, and other sources	48
Scientific research and development services	720	Imputations, adjustments, and other sources	720
Advertising, public relations, and related services	50,438	Economic Census product lines	50,438
Electronic and precision equipment repair and maintenance	4	Economic Census product lines	4
Total Industry Supply	74,493		74,493

Supply Table Column by Data Source

Commodities	Data Source		NAICS	NAPCS	Receipts
All other retail	EC product lines	37			
Motion picture and video industries	EC product lines	134			
Sound recording industries	EC product lines	14			
Radio and television broadcasting	EC product lines	11,555			
Cable and other subscription programming	EC product lines	920	515120	35800	564.67
			515112	35740	2.28
			515111	35740	352.668
Advertising, public relations, and related services	EC product lines	50,438			
Electronic and precision equipment repair and maintenance	EC product lines	4			
<i>All commodities</i>	Imputations, adjustments, and other sources	11,391			
Total Industry Supply		74,493			

~85% of the value in this column comes directly from EC product lines data

- Product lines data covers receipts by industry and product type data for the services and distributive trade sectors (SLLS1 tables)

Industry (NAICS)	Product Type (NAPCS)	Establishment Count	Receipts
515120, TV broadcasting	35800, Licensing of rights to distribute specialty programming content	201	564,670
...			
515112, Radio stations	35740, Licensing of rights to distribute specialty programming content	28	2,280
...			
515111, Radio networks	35740, Licensing of rights to distribute specialty programming content	60	352,668
...			

Source: Economic Census 2012. Thousands of dollars.

Economic Census Microdata Sketch

**These numbers are provided as an example. They do not reflect actual microdata data values.*

Establishment ID	Firm Type	NAICS	NAPCS	Product Level Receipts*
1	U.S. Parent	515120	35800	70,000
2	U.S. Parent	515120	35800	84,000
3	U.S. Parent	515120	35800	126,000
4	U.S. Affiliate	515120	35800	80,000
5	Other Domestic	515120	35800	8,000
6	Other Domestic	515120	35800	32,000
				400,000

- Not all establishments report product-level sales. Census uses an expansion process to weight product-level sales up to total sales
- Weights are calculated at the most detailed industry level by state, tax exempt status, auxiliary status, and separately for broad and detail level product codes

Economic Census Microdata Sketch


**These numbers are provided as an example. They do not reflect actual microdata data values.*

Establishment ID	Firm Type	NAICS	NAPCS	Product Level Receipts*	Expanded Receipts*
1	U.S. Parent	515120	35800	70,000	98,817
2	U.S. Parent	515120	35800	84,000	118,581
3	U.S. Parent	515120	35800	126,000	177,871
4	U.S. Affiliate	515120	35800	80,000	112,934
5	Other Domestic	515120	35800	8,000	11,293
6	Other Domestic	515120	35800	32,000	45,174
				400,000	564,670

395,269

112,934

56,467



- Once expanded values are computed, we can tabulate sales by MNE type

- *Questions*

- Should weighting process be adjusted to incorporate MNE firm type?
- Implications of coverage differences by firm type? (77% of MNEs but only 31% of non-MNEs report product detail)

Economic Census Tabulations, Now by Firm Type

NAICS	NAPCS	Establishment Count	Receipts	U.S. Parent*	U.S. Affiliate*	Other Domestic*
515120, TV broadcasting	35800, Licensing of rights to distribute specialty programming content	201	564,670	395,269	112,934	56,467
...						
515112, Radio stations	35740, Licensing of rights to distribute specialty programming content	28	2,280	1,345	182	752
...						
515111, Radio networks	35740, Licensing of rights to distribute specialty programming content	60	352,668	208,074	28,213	116,380
...						

Same process to split these rows

**These numbers are provided as an example. They do not reflect actual reported or estimated data values.*

Back to the Supply Table Framework

Commodities	Data Source		NAICS	NAPCS	Receipts	U.S. Parent*	U.S. Affiliate*	Other Domestic*
All other retail	EC sales by product	37						
Motion picture and video industries	EC sales by product	134						
Sound recording industries	EC sales by product	14						
Radio and television broadcasting	EC sales by product	11,555						
Cable and other subscription programming	EC sales by product	920	515120	35800	564.67	395.27	112.93	56.47
			515112	35740	2.28	1.35	.18	.75
			515111	35740	352.668	208.07	28.21	116.38
Advertising, public relations, and related services	EC sales by product	50,438						
Electronic and precision equipment repair and maintenance	EC sales by product	4						
All commodities	Imputations, adjustments, and other sources	11,391						
Total Industry Supply		74,493						

= 604.69
= 141.32
= 173.6

**These numbers are provided as an example. They do not reflect actual reported or estimated data values.*

And Into an Extended Supply Table

Commodities	Radio and Television Broadcasting (515100)	U.S. Parent*	U.S. Affiliate*	Other Domestic*
Power and communication structures	12			
All other retail	10			
Motion picture and video industries	134			
Sound recording industries	14			
Radio and television broadcasting	22,193			
Cable and other subscription programming	920	605	141	174
Custom computer programming services	48			
Scientific research and development services	720			
Advertising, public relations, and related services	50,438			
Electronic and precision equipment repair and maintenance	4			
Total Industry Supply	74,493			

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Finishing the Extended the Supply Table

- The process shown covers much of the data needed to extend supply table columns in services and distributive trade industries
- Underlying data structures and methods are somewhat different for manufacturing industries but same general idea
- Other source data and adjustments will likely be allocated using ratios derived from disaggregated portions of the table cells and/or columns

- Similar work has started to disaggregate Census survey source data on expenses by type for the use table
- Additional challenges anticipated here include,
 - Limited data on shipments between domestic business units (commodity flow data), and
 - Information gaps on use, and destination by firm, of imported goods

The Way Forward



- MNE extended supply table is close to being completed, work on the extended use table is at an earlier stage
- Microdata work is being done in an FSRDC work environment. Results must go through Census and BEA disclosure processes prior to release
- Confidentiality restrictions will limit what can be published
 - Limits on level of detail released
 - Limits on overall quantity of results released
 - May be possible to explore using noise infusion
- Challenges and limitations of disclosure lead to questions regarding scope and timing for publishing results

- Should we release full extended tables or limit focus to derived statistics, such as TiVA?
 - Full tables are large, releasing them will require a lot of disclosure-related work
 - Publishing a narrower set of statistics derived from the final tables could reduce disclosure burdens but would lose some of the value from producing the tables and likely not reduce effort in producing
- Should certain industries be prioritized over others? What criteria should be used to identify priorities?
 - Some industries may have little to no multinational activity, no need to extend
 - Comparing microdata approach results with prior results could help identify areas where the more robust method has the largest impact
- What level of aggregation should we release?
 - We could try to release as much detail as disclosure rules allow, or something more limited

- Should we release pieces of the tables as they become available, wait until the full ESUT is complete, or something in between?
 - Extended supply table is near completion. We could try to release that or related results in the next few months. We could try to release a subset of industries from the supply table even sooner, or from both tables sooner than completion of the full tables.
 - Use table is generally the more interesting component. Supply table on its own provides limited information or additional analysis. Prior efforts to produce and release results for a single industry were complicated by inter-industry dependencies.
 - Disclosures from the supply table or a subset of industries now could result in undesirable limitations on disclosures from the use table in the future: aggregation/scope decisions based on the supply table now may differ from what would be ideal based on the use table and overall quantity restrictions could impose limitations

- Comments or suggestions on current approach
- Suggestions for related work or research
- Thoughts on disclosure and publication options

Thank you

