

Multinational Firms in the U.S. Economy: Insights from Newly Integrated Microdata

*Federal Committee on Statistical Methodology Research and
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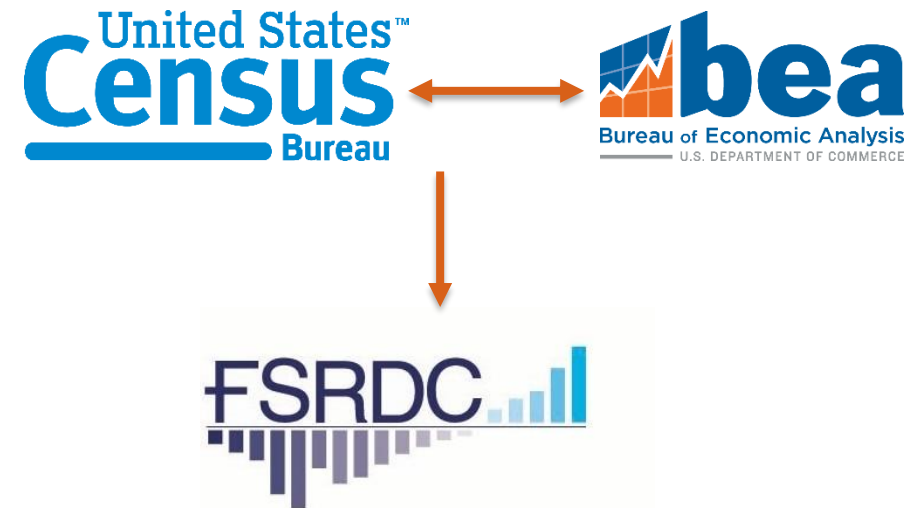
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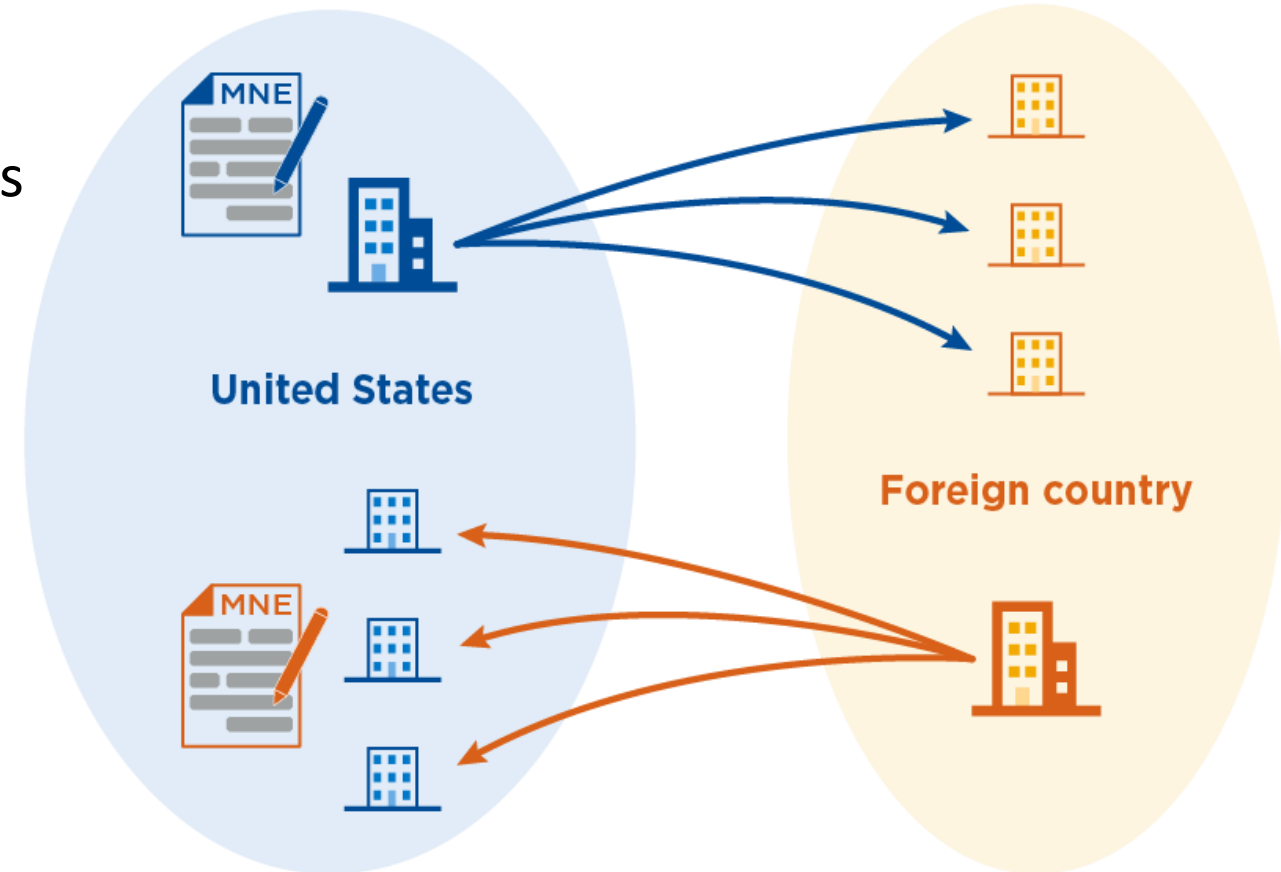
The views expressed in this paper are those of the author and do not necessarily represent the U.S. Bureau of Economic Analysis (BEA) or the U.S. Department of Commerce. BEA has reviewed this paper for unauthorized disclosure of confidential information and has approved the disclosure avoidance practices applied to this release. The statistical analysis of firm-level data was conducted at a Federal Statistical Research Data Center under FSRDC Project Number 6907751, under arrangements that maintain legal confidentiality requirements. (BEA-FY22-P6907751-R1).

- Multiyear project led by Census Bureau (Census) researchers to link entity records from BEA's international surveys to the Census Business Register
- Resulting links are available for use by researchers in Federal Statistical Research Data Centers and are being used on internal BEA and Census projects to develop new statistics
- Additional detail available in working paper



BEA Multinational Enterprise (MNE) Activities Surveys

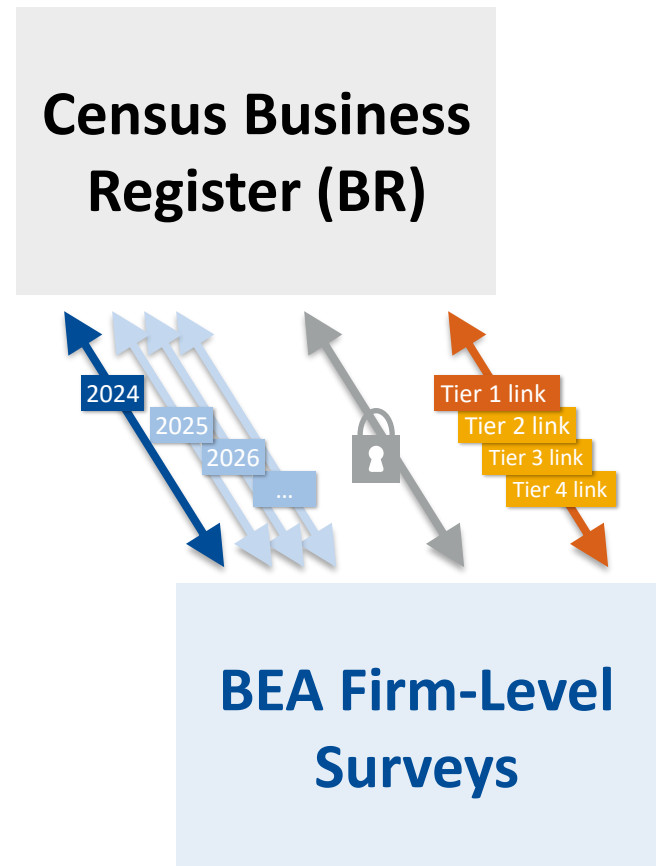
- **‘Outward’ MNE surveys** – collect data from U.S. companies with foreign holdings
 - U.S. parents and their foreign affiliates
- **‘Inward’ MNE surveys** – collect data from U.S. companies with foreign owners
 - U.S. affiliates
- Annual data currently linked
 - Outward (BE-10/11): 1994 to 2019
 - Inward (BE-12/15): 1997 to 2019



- Census Business Register (BR)
 - Record of all U.S. business establishments and companies with paid employees sourced from tax filings
 - Sampling frame for economic censuses and Census employer business surveys
 - Links to a wide array of Census microdata products

- Benefits of linking BEA's firm-level surveys to the BR
 - Granular sub-firm detail along industry and geographic lines
 - MNE classifications and non-MNE comparisons
 - Additional data elements

- **Each BEA survey is separately linked for each year**
 - Include both reported and imputed ('universe') records
 - Initially excluded zero employment records, though those links are available now
- Multiple round matching algorithms on various identification variables
- **Ranking measure of strength is assigned to each link**
 - Quality threshold applied to determine if the link will be retained
- **Highest ranked link is designated as the final link**
 - Each BEA record links to at most one Census firm record in final file
 - A given Census firm record can link to more than one BEA record
- **Production-ready design allows for quick expansion to additional years**



Iterative Matching Algorithms

EIN Matching

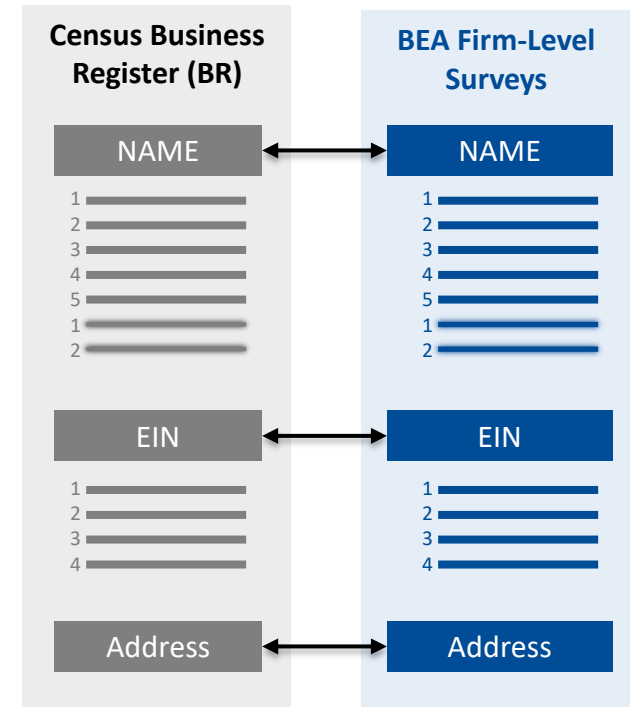
- Up to two primary EINs from BEA records compared with near universe of employer EINs from BR records (payrolls & income tax EINs)
- Window matching uses current, adjacent, then further out years

Name Variant Matching

- Five step deterministic matching based on original and standardized versions of text
- Two step probabilistic matching based on fuzzy matching + four-part ML algorithm

Address Matching

- Street names, city, zip code, and state



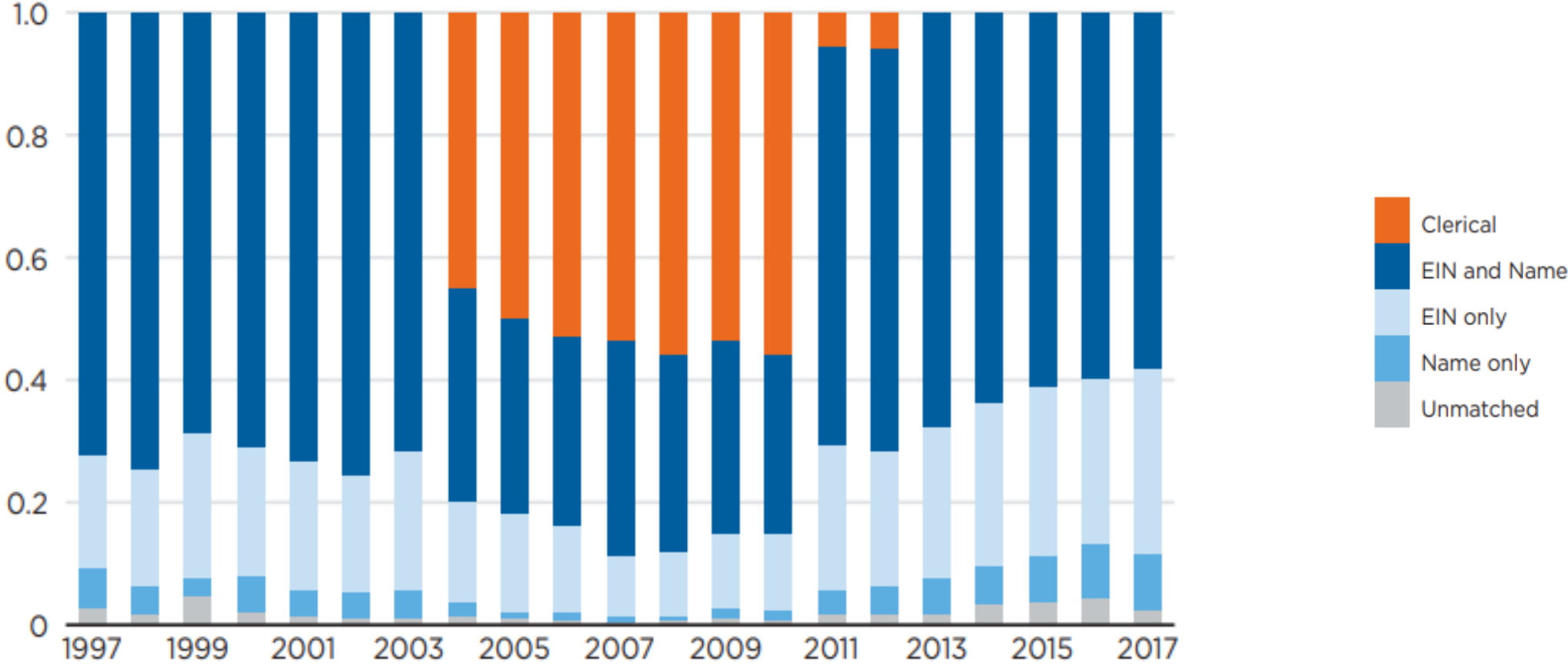
- Ranking based on matching algorithm results + other factors
- Complex structure with many possible values, but generally
 - Clerical matches believed to be of high quality are given precedence
 - EIN matches with common zip, state, industry and a close employment ratio are next highest
 - Among matching criteria, EIN matches rank higher than non-EIN; name + address rank higher than just name; type of name match also considered
 - Among other factors, multi-unit status ranks higher than industry, and industry rank higher than state
- Rank variable included in final link files allowing users to impose stricter criteria if desired

Ranking Factors

- Multi-unit status
- Employment ratio
- Common industry
- Common state
- Common zip code
- Year of match

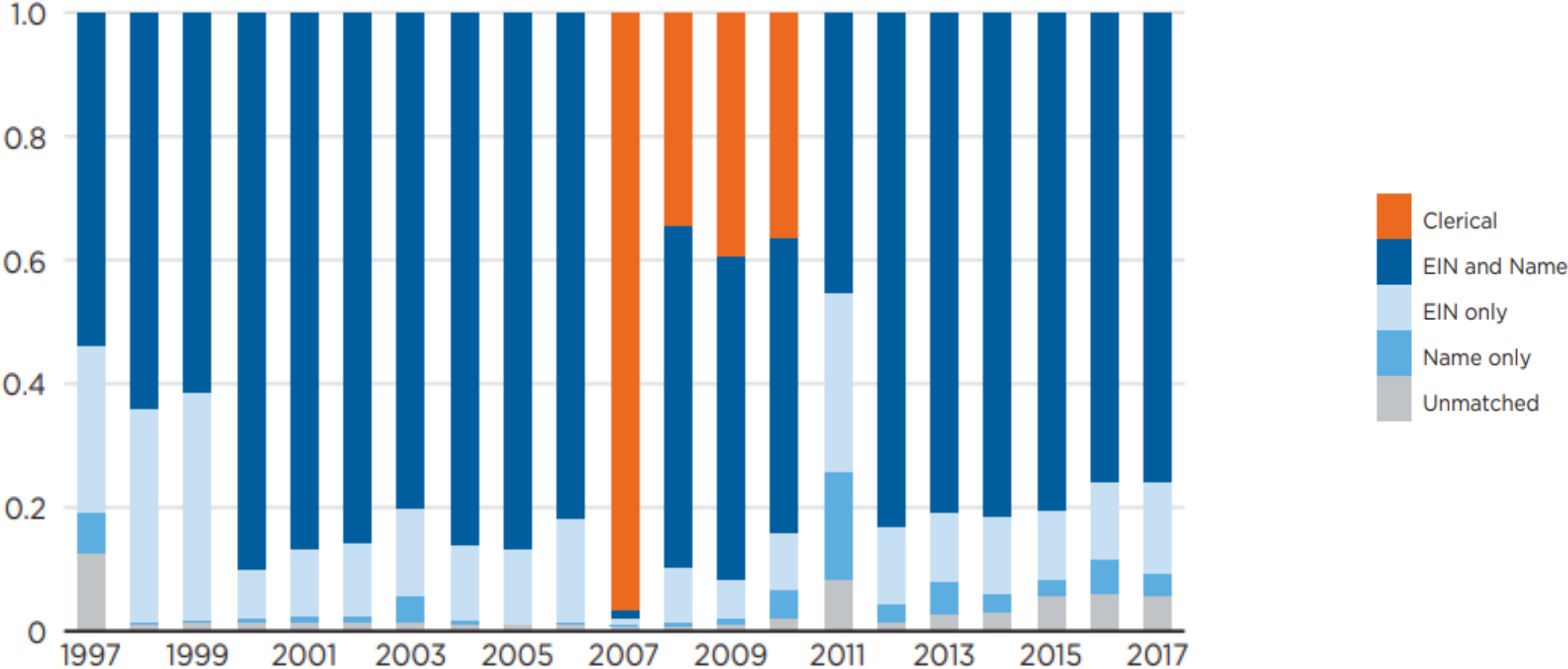
Employment-weighted Match Rates

(a.) Parent Crosswalk (BE-10/11 and BR)



Employment-weighted Match Rates

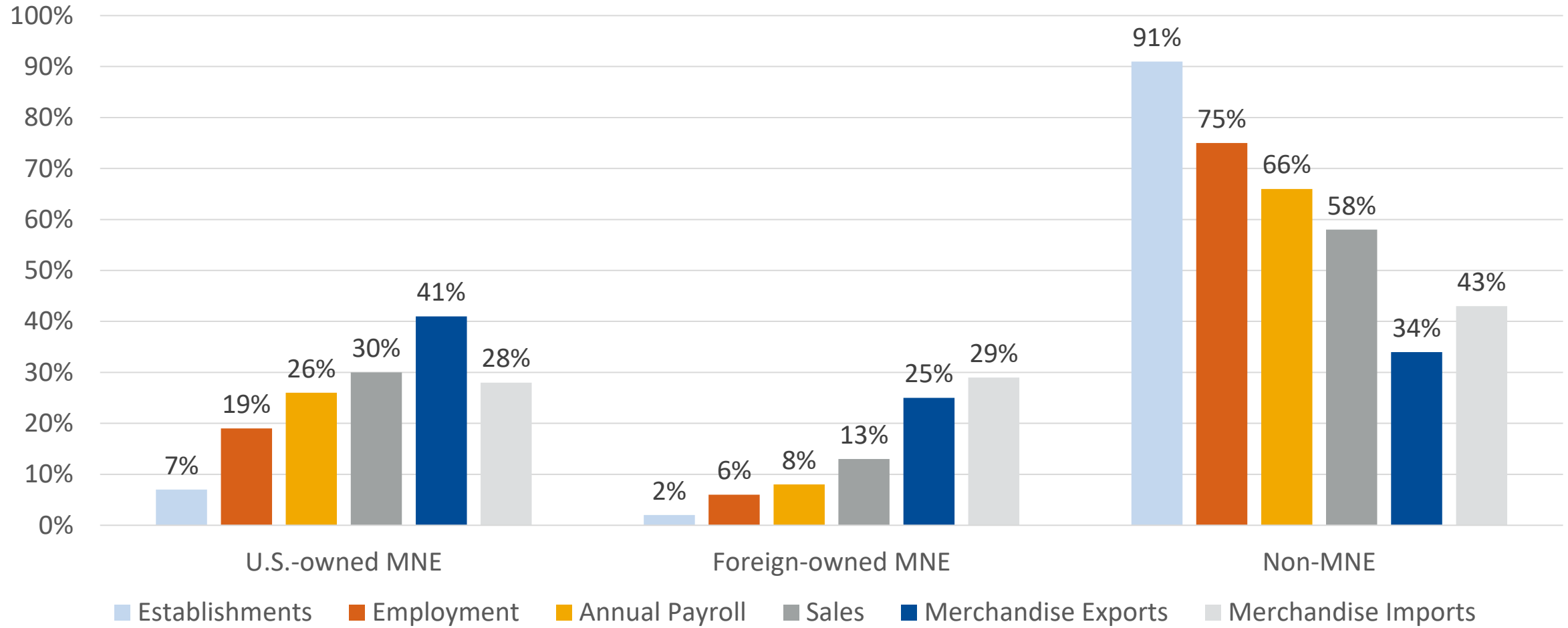
(b.) Affiliate Crosswalk (BE-12/15 and BR)



- Objective: identify firms that are part of MNEs, classify them as foreign or U.S. owned
 - U.S. parent link => MNE, potentially U.S.-owned
 - Majority-owned U.S. affiliate link => MNE, presumptively foreign-owned
 - No links => non-MNE
- Census firms linked to both a U.S. parent and majority-owned U.S. affiliate are classified as foreign-owned MNEs, *unless*
 - The linked U.S. affiliate has a U.S. ultimate beneficial owner* *or*
 - The linked U.S. affiliate has negligible relative employment and is not recognized as the same reporting unit as the U.S. parent in BEA records

*The ultimate beneficial owner (UBO) is that entity, proceeding up a U.S. affiliate's ownership chain, beginning with and including the foreign parent, that is not owned more than 50 percent by another entity

Shares of Economic Activity by Multinational Status, 2017



Sources: Economic Census, LFTTD, BE-10/11-BR, BE-12/15-BR

Scope of Activity by Multinational Status, 2017

	U.S.-owned MNE	Foreign-owned MNE	Non-MNE
Multi-Establishment	65%	35%	3.2%
Multi-Sector	46%	23%	.8%
Multi-State	56%	29%	.9%
<i>Average number of:</i>			
Establishments	96	20	1.23
Industries (4-digit)	3	2	1.02
States	8	3	1.03
Counties	14	5	1.08
Product Exports (HS6)	23	17	5
Product Imports (HS6)	21	16	6

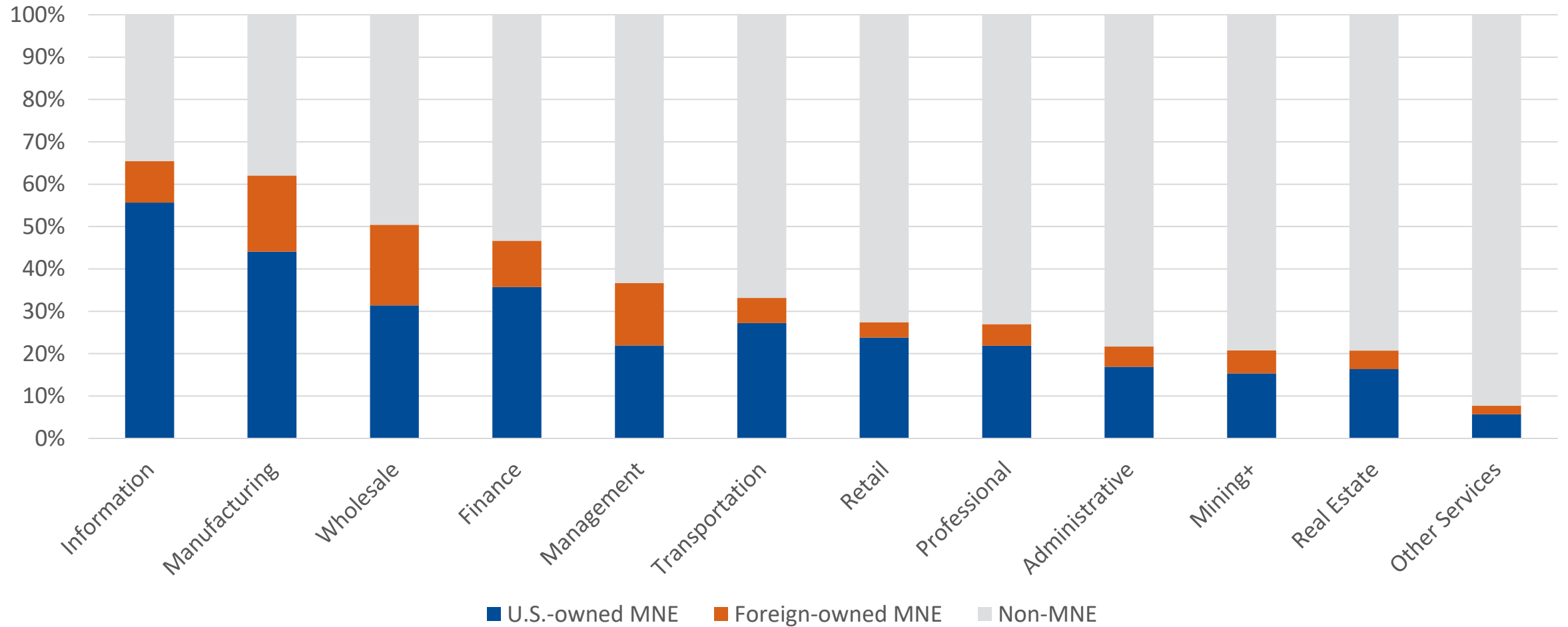
Productivity and Multinational Status, 2017

(\$1,000s)	U.S.-owned MNE	Foreign-owned MNE	Non-MNE
Average Payroll Per Worker	58.8	56.2	39.4
Difference from industry average	9.6	10.8	-1.04
Average Sales Per Worker	539.7	649.2	227.5
Difference from industry average	212.1	286.1	-24.3

Difference from industry average = the average difference in the establishment reported values and corresponding detailed industry average.

- MNEs have substantially higher payroll and sales per worker on average, even after adjusting for industry composition
- Consistent with findings that MNEs have higher productivity and employ higher skilled workers

Average Sales by Sector and Multinational Status, 1997-2017



Sources: Economic Census, BE-10/11-BR, BE-12/15-BR

- Experimental **Business Dynamics Statistics (BDS)** for *Globally Engaged Firms*
 - Using links between the BR and administrative trade records, business dynamics statistics for *goods traders* were released in 2021 and updated last year
 - Currently working on developing similar statistics for *multinationals* using the MNE links
 - Future work will extend service survey links and other sources to create statistics for *services traders*
- BDS use the Longitudinal Business Database to track changes over time in
 - Employment - job creation and destruction
 - Job expansions and contractions
 - Number of establishments and firms
 - Establishment openings and closings
 - Number of startups and firm shutdowns

- Kamal, McCloskey, and Ouyang (2022). “Multinational Firms in the U.S. Economy: Insights from Newly Integrated Microdata” BEA Working Paper 2022-11, <https://www.bea.gov/system/files/papers/BEA-WP2022-11.pdf>
- Business Dynamics Statistics program, <https://www.census.gov/programs-surveys/bds.html>
- Business Dynamics Statistics of U.S. Goods Traders, <https://www.census.gov/programs-surveys/ces/data/public-use-data/experimental-bds/bds-goods-traders.html>

Thank you!

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Sector Groupings

Sector	Short Name	Full Name
21-23	Mining+	Mining, Quarrying, and Oil and Gas Extraction; Utilities; Construction
31-33	Manufacturing	Manufacturing
42	Wholesale	Wholesale Trade
44-45	Retail	Retail Trade
48-49	Transportation	Transportation and Warehousing
51	Information	Information
52	Finance	Finance and Insurance
53	Real Estate	Real Estate and Rental and Leasing
54	Professional	Professional, Scientific, and Technical Services
55	Management	Management of Companies and Enterprises
56	Administrative	Administrative Support and Waste Management and Remediation Services
61-81	Other Services	Educational Services; Health Care and Social Assistance; Arts, Entertainment, and Recreation; Accommodation and Food Services; Other Services (except Public Administration)