

# **A Long View of Employment Growth and Firm Dynamics in the United States: Importers vs. Exporters vs. Non-Traders**

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## Abstract

The first experimental product from the U.S. Census Bureau's Business Dynamics Statistics (BDS) program -- BDS-Goods Traders -- provides annual, public-use measures of business dynamics by four mutually exclusive goods-trading classifications: exporter only, importer only, exporter and importer, and non-trader. The BDS-Goods Traders offers a comprehensive view of employment growth at firms associated with goods trading activities in the United States from 1992-2019. We highlight three patterns. First, employment is skewed towards goods traders in several ways. Only 6% of all U.S. firms are goods traders but they account for half of total employment. Moreover, 80% of large firms and 70% of older firms are goods traders. Second, exporter-importer firms represent 70% of manufacturing employment and over half of employment in services-producing industries (management, retail, transportation, utilities, and wholesale). Third, goods-traders exhibit higher net job creation rates than non-traders controlling for firm size, age, and sector. Goods traders contribution to total job creation grows over time, rising to more than half after 2008.

**Keyword:** exporters, importers, job creation, job destruction, entry, exit

**JEL Classification:** F10, F14, F23

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\* Comments welcome. The title is inspired by Haltiwanger, Jarmin and Miranda (2013). Author contact: khandley@ucsd.edu, fariha.kamal@census.gov, and wei.ouyang@census.gov. Any views expressed are those of the authors and not those of the U.S. Census Bureau. The Census Bureau's Disclosure Review Board and Disclosure Avoidance Officers have reviewed this data product for unauthorized disclosure of confidential information and have approved the disclosure avoidance practices applied to this release (DRB Approval Number: CBDRB-FY21-270). We thank J. Bradford Jensen, Shawn Klimek, Martha Stinson, and participants at the CES Brown Bag series for helpful comments and discussions. We owe a special thanks to Marina Krylova and Kimberly Blair for exceptional programming support.

# 1 Introduction

A common perception is that exporting spurs and importing impedes domestic job growth. However, the pervasiveness of global supply chains in the modern production landscape implies a complex relationship between firms’ export and import decisions. Likewise, there is a growing share of employment in the services sector at firms that participate in international trade. Understanding the implications of export and import participation on jobs requires comprehensive and longitudinal information on firms, workers and trade transactions. Public-use data linking job creation and business dynamics to trade participation has not been available until now. We provide a set comprehensive statistics describing employment growth and firm dynamics at goods-traders and non-traders across all sectors in the U.S. economy.

We describe the first experimental product from the U.S. Census Bureau’s Business Dynamics Statistics (BDS) program—BDS-Goods Traders.<sup>1</sup> The BDS provides annual measures of business dynamics that include job creation and destruction, establishment births and deaths, firm entry and shutdowns for the economy overall and aggregated by establishment and firm characteristics. The BDS-Goods Traders provides annual measures of business dynamics by four mutually exclusive goods-trading classifications: exporter only, importer only, exporter and importer, and non-trader.

The public-use BDS-Goods Traders can be used to answer a variety of questions such as: How many businesses trade in goods? What share of businesses and jobs are tied to trading activities? What is the size and age of these businesses? In what sectors do they operate? How many jobs do they create or destroy? How do traders fare during economic downturns? Do they outperform non-trading businesses? The statistics are useful to characterize goods traders’ business dynamics. But the statistics, on their own, cannot be used to assign a causal interpretation to the relationship between goods-trade and business dynamics.

Our contribution to the long view of employment growth at U.S. goods-traders is twofold. First, we demonstrate how the BDS-Goods Traders can be used to inform researchers and practitioners on important questions about the role of international trade participation in U.S. business dynamics and job growth. We quantify the economic importance of goods traders in U.S. employment and how it varies by firm characteristics—firm size, firm age, broad geography, and industry—and trade participation—importer, exporter, or both. Second, we highlight the growing contribution of goods-traders to job creation. We find net

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<sup>1</sup>Census Bureau’s experimental data products are “innovative statistical products created using new data sources or methodologies that benefit data users in the absence of other relevant products.” (U.S. Census Bureau, 2021f).

job creation is higher at goods-traders than non-traders, which we refer to as the goods-trader premium, in both the goods-producing and services-providing sectors. A large share of the goods-trader employment growth premium is driven by the extensive margin—jobs supported by the net entry of new establishments—suggesting that participation in international markets has spurred new business activity and opportunities. In contrast, the contribution of non-traders to job growth declines over time and occurs primarily at incumbent establishments.

We characterize goods-traders’ rising contribution in net employment growth after 2007 as a “survive, then thrive” pattern. Our analysis suggests an important transition by goods-traders, especially between 2001 and 2007, as the U.S. economy adjusted to globalization and major shocks, such as China’s 2001 accession to the World Trade Organization (WTO). Goods-trading firms and entire sectors that could adapt to competition or access new international markets for inputs and outputs, survived and become important sources of employment growth in the recovery from the Great Recession. This development complicates the application of traditional mercantilism to international trade, as some of the most dynamic firms and sectors create jobs by participating in both importing and exporting activity.<sup>2</sup>

The BDS-Goods Traders relies on links between two confidential micro data sets—the Longitudinal Business Database (LBD) and the Longitudinal Firm Trade Transactions Database (LFTTD). Firm level trade indicators (exporter only, importer only, exporter and importer) are constructed using LFTTD. A firm in the LBD that is not classified in one of the three trading categories is defined as a non-trader. The LBD tracks U.S. establishments in the non-farm, private sector universe consistently over time (Chow, Fort, Goetz, Goldschlag, Lawrence, Perlman, Stinson and White, 2021). The LFTTD links the universe of merchandise transactions to U.S. firms in the Census Bureau’s Business Register (BR); however, not all transactions can be linked to a U.S. firm (Kamal and Ouyang, 2020).<sup>3</sup> Therefore, BDS-Goods Traders does not represent the universe of good traders but the set of *known* goods exporting and importing firms.

The public-use statistics confirm that goods trading is a rare activity—about 6% of firms trade in goods in a given year but they account for nearly half of total employment. Moreover, firms that both export and import are even rarer—representing only 2% of firms but over 35% of total employment. The skewed distribution of employment towards firms that participate in both margins among goods traders reflects the aggregate trade distribution. Bernard,

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<sup>2</sup>Mercantilism refers to an economic system that maximizes exports and minimizes imports, often by promoting domestic activity through protectionism and industrial policy.

<sup>3</sup>Merchandise transactions are collected for export values at or above \$2,500 and import values at or above \$2,000.

Jensen, Redding and Schott (2018) document that average total trade for the largest 10% of firms, who are also exporters and importers, is 42 times greater than average trade of firms in the previous decile. The economic importance of firms that both export and import highlight the interconnections between trading activities and hence the need to carefully assess the relationship between trading activities and employment growth.

The BDS-Goods Traders also reveal that there is a monotonically increasing relationship between goods-trading status and firm size as well as between goods-trading status and firm age. On average, over 80% of employment at large (employ 500 or more workers) firms is at goods-trading firms with 63% at firms that both export and import; in contrast, 93% of employment at small (employ less than 20 workers) firms is at non-trading firms. Employment shares at goods-traders within an age class reveals that 92% of births are at non-traders while over 70% of employment at firms born before 1977 is at goods-traders.

Goods-traders operate in a diverse set of sectors across the economy. They account for over 80% of employment in the manufacturing sector and more than half of employment in agriculture and mining, retail, transportation, utilities, wholesale, information, finance, insurance and real estate, and management. We also find that firms in the U.S. economy have been shifting away from goods-producing to services-providing industries between 1992 and 2019 and this pattern is more pronounced for firms that export. Thus, goods-trading firms' operations are not only concentrated in goods-producing industries, but increasingly in services-providing industries.

Goods-traders' contribution to the economy-wide net job creation between 1992-2019 averages 40%, but this share is growing over time. After the 2008 Great Recession, goods-traders account for 60% of the annual average net job creation rate. This is driven by higher rates of net establishment entry rather than net employment growth at existing establishments. On average, goods-traders have higher net job creation rates than non-traders controlling separately for size, age, and detailed industries. Within manufacturing, wholesale, and retail sectors—which together account for about one third of U.S. employment—there is a net job creation premium at goods-traders. Net job creation at importer only firms is consistently higher than all other firm types, which defies the common perception that only exporters create jobs.

The rest of the paper is organized as follows. Section 2 describes the data sources and the public-use BDS-Goods Traders. Section 3 describes the BDS methodology. Using the public-use BDS-Goods Traders, Section 4 characterizes goods-traders in the U.S. economy and Section 5 presents results on net job creation. Section 6 provides a discussion of the results. Finally, Section 7 discusses open research questions and the ongoing research agenda to expand the BDS along two additional dimensions of global engagement—services trade

and multinational activity—in addition to goods trade.

## 2 Data

We rely on two data sources to construct the measures of business dynamics statistics of U.S. goods trading firms: the Longitudinal Business Database (LBD) and the Longitudinal Firm Trade Transactions Database (LFTTD). We describe each of these data sources and the resulting public-use BDS-Goods Traders.

### 2.1 Longitudinal Business Database

The LBD contains the universe of U.S. establishments in the non-farm, private sector with time-consistent establishment links enabling accurate identification of births, deaths, and transitions from single-unit to multi-unit status (Chow et al., 2021).<sup>4</sup> An establishment is associated with a parent firm indicated by a firm identifier. The BDS is constructed using the following information in the LBD at the establishment level: firm affiliation, year of birth, six-digit NAICS, state, and employment. We link the LBD to the LFTTD using common firm identifiers. See Appendix A.1 for details on the linking algorithm.

### 2.2 Longitudinal Firm Trade Transactions Database

The LFTTD combines merchandise export and import transactions from confidential customs declaration forms with administrative data on the universe of non-farm, private sector U.S. firms in the Census Bureau’s BR (Kamal and Ouyang, 2020). The LFTTD covers the universe of imported shipments valued over US\$2,000 and exported shipments valued over US\$2,500 of merchandise goods. The LFTTD enables identification of U.S. firms that export or import goods.

The LFTTD is not the universe of goods trading firms in the U.S.; it is the set of *known* goods exporting and importing firms. The LFTTD does not represent the universe of U.S. merchandise exporting or importing firms because, on average, it contains a firm identifier for approximately 89% of export and import value in customs transactions records with higher match rates in later years. (Kamal and Ouyang, 2020). Customs transactions records may not match BR records for three main reasons. First, the BR only contains the set of Employer Identification Numbers (EIN) used for income and payroll tax filings associated

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<sup>4</sup>LBD excludes operations with no statutory employees, e.g. self-employed, farms (but not agri-business), and the public sector.

with a firm. It is possible that a firm uses a different set of EINs to file merchandise trade shipments. Therefore, EINs in the transaction records need not be in the universe of payroll active EINs known to the Census Bureau. Second, firms may file trade shipments using an identifier other than the EIN (or name) such as a foreign identifier or Social Security Number (SSN). Finally, a small but non-negligible share of export and import shipments are missing identifier information altogether.

### 2.2.1 Trading Status

A firm can only export, only import, both export and import, or not trade goods in a given year  $t$ . We classify all firms in the LBD in any given year  $t$  into four mutually exclusive categories: exporter only, importer only, exporter and importer, or non-trader as follows:

- Exporter only: if a firm has non-zero export value in LFTTD and does not have any import transactions in year  $t$
- Importer only: if a firm has non-zero import value in LFTTD and does not have any export transactions in year  $t$
- Exporter and Importer: if a firm has non-zero export and import values in LFTTD in year  $t$
- Non-Trader: if a firm does not have any export or import transactions in the LFTTD in year  $t$

The “Non-Trader” classification captures all firms not classified as one of the three goods-trading types in year  $t$ . It is possible that there may be unidentified goods traders in the “Non-Trader” classification. This is especially relevant in years before 2007. As discussed in Appendix A.1 and shown in Figure A1, LFTTD identifies a significantly higher number of importing firms beginning in 2007 due to the availability of the EIN associated with the ultimate consignee of the import shipment distinct from a broker or intermediary in the transaction.

The goods-trader definition adopted in BDS-Goods Traders does not make distinctions across firms based on volume of trade or years active in foreign markets.<sup>5</sup> Underlying this definition is the assumption that firms that engage in goods trade, irrespective of their exporting volume or tenure, are inherently different from firms that do not trade. Firms

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<sup>5</sup>Trade status definitions based on volume will be sensitive to partial year effects that can significantly alter exporter dynamics. As Bernard, Bøler, Massari, Reyes and Taglioni (2017) explain “[t]wo identical firms that start exporting in different months, one each in January and December, will report dramatically different exports for the first calendar year. This partial-year effect biases down first-year export levels and biases up first-year export growth rates.”

must incur fixed costs to serve or source from foreign markets which implies that larger and more productive firms participate in international trade (Bernard et al., 2018).

The BDS-Goods Traders categorizes the net and gross flows of establishments and jobs at the establishment level by the goods-trading classification of the parent firm. Establishments under common ownership are assigned the same goods-trading classification as the firm. An example illustrates the assignment of goods-trading status for a multi-sector and multi-location firm. Consider a hypothetical Firm A with five establishments – A1, A2, A3, A4, A5 where A1 and A2 operate in the manufacturing sector in State 1; and A3, A4, and A5 operate in the wholesale sector in State 2. Firm A is classified as “exporter only”. BDS-Goods Traders will also classify establishments A1 – A5 as “exporter only”. Establishments A1-A2 will be included in the “exporter only” tabulations for the manufacturing sector; establishments A3-A5 will be included in the “exporter only” tabulations for the wholesale sector. Analogously, establishments A1-A2 will be included in the “exporter only” tabulations for the division corresponding to State 1; establishments A3-A5 will be included in the “exporter only” tabulations for the division corresponding to State 2. Thus, trading status is a firm characteristic that describes the goods-trading activities of the enterprise and not individual establishments.

## 2.3 BDS-Goods Traders

The BDS-Goods Traders provides annual statistics on (i) employment changes and growth rates due to job creation, job destruction, job expansions, and contractions; (ii) number of establishments, firms, establishment openings, establishment closings, firm startups, and firm shutdowns. The first release of the series provides annual statistics for 1992 to 2019. The BDS-Goods Traders will be updated as additional years of the LBD and LFTTD become available.<sup>6</sup> The annual statistics are stratified by the following firm and establishment characteristics using BDS definitions (U.S. Census Bureau, 2021c).

- Economy-wide: the U.S. economy.
- Firm size: three broad size categories of firms in year  $t$  employing (a) 1 to 19; (b) 20 to 499; or (c) 500+ workers.
- Initial firm size: a categorical variable for the three broad firm size classification described above and defined for any given consecutive two-year period as the size in year

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<sup>6</sup>The LBD and LFTTD are typically produced with a two-year lag dictated by availability of the final BR files used to create these data sets. For example, the 2019 LFTTD and LBD are available in 2021.

$t - 1$ . In cases where year  $t - 1$  employment is equal to zero, the initial size is defined as employment in year  $t$ .

- Firm age: five broad age categories indicating the number of years a firm has 1 or more workers as of year  $t$  (a) 0; (b) 1 to 5; (c) 6 to 10; (d) 11+; (e) Left Censored. A firm born prior to 1977 is of unknown age and assigned a firm age of “Left Censored”.
- Division: aggregation of the 50 states into nine Census divisions of the United States (U.S. Census Bureau, 2021g) as follows:<sup>7</sup> (a) 1 – New England; (b) 2 – Middle Atlantic; (c) 3 – East North Central; (d) 4 – West North Central; (e) 5 – South Atlantic; (f) 6 – East South Central; (g) 7 – West South Central; (h) 8 – Mountain; (i) 9 – Pacific.
- Sector: vintage consistent 4-digit NAICS 2017 codes.

The BDS-Goods Traders provides statistics for each of the categories described above separately for exporter only, importer only, exporter and importer, and non-traders. All statistics are aggregated from establishment level employment or counts by the parent firm’s goods-trading status as described in Section 2.2.1. While firm size and firm age are firm characteristics, division and sector are based on the parent firms’ individual establishments. The data can be electronically accessed from the BDS-Goods Traders homepage (U.S. Census Bureau, 2021e) and also from the homepages of the Business Dynamics Statistics program (U.S. Census Bureau, 2021b) or Census Bureau’s experimental data products (U.S. Census Bureau, 2021f).

### 3 BDS-Goods Traders Methodology

The BDS-Goods Traders follows the BDS methodology (U.S. Census Bureau, 2021d). The BDS measure changes in establishment-level employment. Employment changes may arise from the extensive or intensive margins. On the extensive margin, employment can increase due to opening new establishments (entry) or decrease due to closing establishments (exit). On the intensive margin, employment can increase from expansion at existing establishments; or decrease from contractions at existing establishments. A net increase in employment or job creation (JC) is the sum of all employment gains from expanding and startup establishments from year  $t - 1$  to year  $t$ . A net decrease in employment or job destruction (JD) is the sum of all employment losses from contracting and closing establishments from year  $t - 1$  to year  $t$ .

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<sup>7</sup>The divisions are comprised of the following states: New England (CT, ME, MA, NH, RI, VT); Middle Atlantic (NJ, NY, PA); East North Central (IN, IL, MI, OH, WI); West North Central (IA, KS, MN, MO, NE, ND, SD); South Atlantic (DE, DC, FL, GA, MD, NC, SC, VA, WV); East South Central (AL, KY, MS, TN); West South Central (AR, LA, OK, TX); Mountain (AZ, CO, ID, MT, UT, NV, WY); Pacific (AK, CA, HI, OR, WA)

Employment,  $E$ , growth at establishment  $i$  in year  $t$  is defined following Davis, Haltiwanger and Schuh (1996):

$$g_{it} = \frac{E_{it} - E_{i,t-1}}{X_{it}}, \quad (1)$$

where  $X_{it} = 0.5(E_{it} + E_{i,t-1})$ . The DHS growth rate is symmetric and bounded by -2 (exit) and 2 (entry). It is a second-order approximation of the log difference for growth rates around 0.

Changes in employment, job creation and destruction, for establishments classified in a group  $s$  (goods trader classifications by firm size, firm age, division, and sector as defined in Section 2.3) can be described as follows:

$$JC_{st} = \sum_{i \in s} \max\{E_{it} - E_{i,t-1}, 0\} \geq 0, \quad (2)$$

$$JD_{st} = - \sum_{i \in s} \min\{E_{it} - E_{i,t-1}, 0\} \geq 0. \quad (3)$$

The net change in employment is then the difference between total jobs created and total jobs destroyed,

$$NETJC_{st} = JC_{st} - JD_{st}. \quad (4)$$

The growth rates in the different sources of employment changes in a group  $s$  can be computed by dividing the change by the sum of average employment in the same group  $s$ . Therefore, the creation, destruction, and net job creation rates are computed as,

$$JCR_{st} = \frac{JC_{st}}{X_{st}}, \quad (5)$$

$$JDR_{st} = \frac{JD_{st}}{X_{st}}, \quad (6)$$

$$NETJCR_{st} = \frac{JC_{st} - JD_{st}}{X_{st}}. \quad (7)$$

where  $X_{st} = \sum_{i \in s} X_{it}$

## 4 Characteristics of U.S. Goods Traders

We begin by describing basic characteristics of goods trading firms in the United States. Goods trading is a rare activity—about 6% of all U.S. firms are goods traders in any year; and only 20% of establishments are owned by goods-trading firms. However, goods-traders account for almost half (49%) of economy-wide employment. Firms that both export and import goods represent less than 2% of all firms but over a third of total employment in the economy. These average shares are displayed in Figure 1.

Goods traders are also much less likely to shutdown than non-traders. We find that traders, on average, account for 2% of total firm deaths in the economy as shown in Figure 2. Moreover, traders account for almost negligible shares of establishments and employment (2% and 6%, respectively) associated with firm deaths. Among goods traders, firms that both export and import are the least likely to shutdown.

### 4.1 Firm Size

Goods traders are among the largest firms in the U.S. economy, which is consistent with previous findings (Bernard, Jensen and Schott, 2009). There is a monotonically increasing relationship between firm size and goods trading status.<sup>8</sup> Table 1 shows that traders account for only 7% of employment at small (employing between 1 to 19 workers) firms; 25% of employment at medium (employing between 20 and 499 workers) firms; and 81% of employment at large (employing 500 or more workers) firms. Firms that both export and import account for the majority (63%) of employment at all large firms.

While goods trade is a characteristic of large firms, we find that small firms also play an important role in this economic activity. Table 2 shows the employment-weighted size distribution of firms by goods trading status. Small and medium firms together account for around 40% of employment at exporter only and importer only firms. However, this is a much smaller share (10%) at firms that both export and import. Around 90% of all firms that both export and import are large. These statistics suggest that firms engaged globally along multiple dimensions are larger than firms with fewer margins of global engagement.

### 4.2 Firm Age

The low shares of firm deaths among traders imply that traders are long-lived. Table 3 shows the employment-weighted age distribution by trading status confirming that traders tend to

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<sup>8</sup>This relationship also holds using initial firm size.

be older firms.<sup>9</sup> Over 95% of employment at firms that both export and import is associated with firms that are 11 years or older. This share is 85% and 83% for exporter only and importer only firms, respectively. In contrast, only 63% of employment at non-trading firms is associated with firms that are 11 years or older.

While goods traders are likely to be the oldest firms in the economy, a non-trivial share of employment at startup and young firms are associated with trading activities as shown in Table 4. Almost 10% of employment at startups is associated with firms that export or import. This share is a little higher (13%) at firms that are between 1 and 5 years. These statistics are somewhat surprising given the high information costs, such as learning about foreign markets, associated with trading which imply that it would be more difficult for younger firms to penetrate new foreign markets. These startup and young trading firms might be the result of spin-offs from larger firms. They may also be startup operations that perform design and marketing operations domestically, but outsource goods production overseas. Job creation *and* destruction at young firms is typically high (often due to shutdowns), but the continuing firms may eventually become larger employers. We leave it to future research to investigate the dynamics of young goods-trading firms.

### 4.3 Sector

We explore the industrial distribution of traders organized by broad sectors in Table 5 separated into goods-producing and services-providing industries. Goods-producing industries include natural resources and mining, construction, and manufacturing; services-providing industries include trade, transportation, utilities, financial activities, professional and business services, education and health services, leisure and hospitality, and other services (Bureau of Labor Statistics, 2021). Looking across a row which indicates a broad sector, we find that about 85% of employment in the manufacturing sector is at goods trading firms with 70% associated with firms that both export and import. Traders account for a smaller share (45%) of employment in the non-manufacturing sector. Nonetheless, 30% of non-manufacturing employment is housed at firms that both export and import.

We classify four-digit industries into the following broad groups—accommodation, administrative, agriculture and mining, arts, construction, education, finance and real estate, health, information, manufacturing, management, professional services, retail, other services, wholesale, utilities—to explore heterogeneity in the distribution of non-manufacturing em-

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<sup>9</sup>For exporter-importer firms, the share of employment associated with new firms is very small (0.0014) and is shown as 0 due to rounding.

ployment by trading status.<sup>10</sup> Table 5 shows that outside of manufacturing, firms that both export and import account for over half of employment in information (61%), management (72%), retail (51%), transportation (53%), wholesale (52%), and utilities (66%); and about a third of employment in finance and real estate (34%), professional services (28%), and agriculture and mining (42%).

Although goods traders account for majority of employment in the manufacturing sector, Table 6 shows that manufacturing represents a relatively small share of traders’ activities: 14% of exporter only, 10% of importer only, and 25% of exporter and importer firms’ total employment. Goods-traders engage in activities across a diverse set of sectors. Comparisons of the employment shares within a goods-trading classification by broad sectors between 1992 and 2019, as shown in Table 7, reveal that all firms in the U.S. economy have been shifting away from goods-producing to services-providing industries and this pattern is more pronounced for firms that export. The decline in goods-producing employment shares is 4 percentage points (pp) for non-traders but 10pp, 3pp, and 18pp for exporter only, importer only, and exporter and importer firms, respectively. The increase in goods-traders’ employment shares in services-providing industries reflects not only the secular trend in the increasing importance of the services sector in the U.S. economy but also the trend towards “servitization”—the phenomenon where manufacturers increasingly sell services (Fort, Pierce and Schott, 2018).

The shift away from goods-producing to services-providing industries among goods traders is consistent with the changing nature of production arrangements that became increasingly reliant on global supply chains beginning in the 1990s precipitated by revolutionary advances in information and communications technology (Baldwin, 2016). The higher shares of services-providing employment at firms that export and import is consistent with factoryless production arrangements where firms outsource processing and manufacturing activities while retaining ownership of the intellectual property and controlling sales to customers (Bernard and Fort, 2015; Kamal, 2018).

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<sup>10</sup>The broad sectors are defined as a single or group of two-digit NAICS as follows: accommodation and food services (NAICS 72), administrative and support and waste management and remediation services (NAICS 56), agriculture, forestry, fishing and hunting and construction (NAICS 11, 23) arts, entertainment, and recreation (NAICS 71), educational services (NAICS 61), finance and insurance and real estate and rental and leasing (NAICS 52, 53), health care and social assistance (NAICS 62), information (NAICS 51), manufacturing (NAICS 31, 32, 33), management of companies and enterprises (NAICS 55), professional, scientific, and technical services (NAICS 54), retail trade (NAICS 44, 45), other services and public administration (NAICS 81, 92), transportation and warehousing (NAICS 48, 49), wholesale trade (NAICS 42), utilities (NAICS 22).

## 4.4 Geography

Table 8 shows that traders and non-traders are similarly distributed across the nine Census divisions. Roughly half of all employment in a division is at non-trading firms; over a third at exporters and importers; and the remaining at exporter only (9%) and importer only (6%) firms. The even distribution of goods trading activities across space is corroborated in Table 9 which shows the employment-weighted shares of regional activity by goods-trading classifications. Non-traders and traders exhibit very similar employment shares in the nine different divisions which simply reflects the U.S. population shares in each of these divisions (U.S. Census Bureau, 2021i).

The regional statistics suggest that the activities of goods traders are evenly distributed across space. However, we cannot rule out that goods-trading activities may be highly concentrated in more granular definitions of geography. For example, Boehm, Flaaen, Pandalai-Nayar and Schlupp (2021) document that 5% of counties account for over 70% of total U.S. exports. Their analysis also reveals that most of the variation in exporting activities occurs within rather than across states strongly suggesting that spatial concentration of trading activities may be masked across broad divisions.

## 5 Do U.S. Goods Traders Create Jobs?

In this section, we examine the rates of net job creation, job creation, and job destruction by goods-trading status. We begin with aggregate data and then analyze differences in job growth along size, age, and sector characteristics.

### 5.1 Economy-wide Job Creation

We begin by plotting the annual net job creation rates by the goods-trading classifications in Figure 3. Comparing net job creation rates across types, two key patterns emerge between 1992 and 2019. First, importer only firms display the highest net job creation rates during most of this 28 year period, particularly during downturns. Second, net job creation rates by firms that both export and import tend to be lower than non-traders and other goods traders except during recessions. The average net job creation rates over this entire time period are 2.8% for importer only firms followed by exporter only firms (1.7%), non-traders (1.4%), and exporter-importer firms (0.45%). Separately exploring the job creation and job destruction margins in Figures 4 and 5, respectively, reveals that importer only firms have higher net job creation rates because they have lower job destruction rates compared to all other firm types.

How important is each goods-trader type for economy-wide net job creation? To answer this question, we compute the overall net job creation rate for the economy and decompose it into the contribution from non-traders and traders (importers, exporters, and importer-exporters). The first four panels of Table 10 display the contribution of each type to the overall net job creation rate, which sums up to the total in the bottom panel. We further decompose each trader type’s contribution into net job creation at continuing establishments (intensive margin) and from establishment births and deaths (extensive margin).

Goods-traders are an important source of net job creation and differ from non-traders across the intensive and extensive margins. Overall net job creation rate is 1.18% over the entire period from 1992 through 2019 as shown in Table 10. Of this total, the net job creation rate is 0.71% at non-traders and 0.47% at goods-traders. Thus, goods-traders account for 39% of the overall net job creation rate in the economy.<sup>11</sup> Job creation at non-traders occurs primarily through continuing establishments (the intensive margin) rather than through net establishment entry (births minus deaths). Specifically, the net job creation via the extensive margin for non-traders is only 0.15%. This accounts for a share of only 13% in overall net job creation. In contrast, exporter-importers alone create more net jobs on the extensive margin compared to non-traders (0.19% vs. 0.15%). Moreover, the share of the extensive margin at goods-traders is 70% of overall net job creation from 1992-2019.

The role of goods-traders in net job creation also grows in importance over time, especially during the recovery from the 2008 global financial crisis and “Great Recession.” The BDS-Goods Traders time series encompasses three U.S. business cycles with peaks in July 1990, March 2001, and December 2007 (National Bureau of Economic Research, 2021). In Table 10 we compute average net job creation rates in each of these business cycles from peak-to-peak. Goods-traders’ contribution to net job creation is increasing over time. Between 1992-2000, goods-traders accounted for 35% of total net job creation. Goods-traders contributed very little during the 2001-2007 period at only 10%. After 2008, however, goods-traders are responsible for 60% of total net job creation. We find that the vast majority of goods-trader’s contribution to net job creation rate is driven by the extensive margin, consistent with goods-traders creating jobs through new establishments. Moreover, after 2008 the contribution of non-traders to the extensive margin averages a negligible 0.04%, or almost 8 times less than the extensive margin contribution of all goods-traders.

The aggregate job creation statistics demonstrate the growing role of goods-traders in overall net job creation. In the following sections, we investigate the role of firm size, firm

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<sup>11</sup>The net job creation rate by goods-traders in all years is obtained by summing  $0.07 + 0.13 + 0.17 = 0.47$ . The percent share is then calculated as  $(0.47/1.18) \times 100 = 39\%$ .

age, and industry composition of these economy-wide patterns.

## 5.2 Role of Firm Size and Firm Age

We explore heterogeneity in job creation rates across size, age, and industries in the BDS-Goods Traders. We show that the net job creation premium for goods-traders relative to non-traders is persistent and robust to conditioning on these firm characteristics.

The heterogeneity in employment shares by firm size (Table 1) and firm age (Table 4) imply that the aggregate job creation statistics are likely to mask significant heterogeneity by firm size and firm age. Our empirical approach leverages the higher dimensionality in the age, size and industry tables to estimate goods-trader job creation premia, conditional on firm characteristics and time-varying unobservable shocks. We estimate the following representative specification:

$$\begin{aligned} NETJCR_{gst} = & \beta_{Exp}I_{st}(\text{Exporter}) + \beta_{Imp}I_{st}(\text{Importer}) + \beta_{ExIm}I_{st}(\text{Exp-Imp}) \\ & + \delta_{st} + \varepsilon_{gst}, \end{aligned} \tag{8}$$

where  $NETJCR_{gst}$  is the net job creation rate in a goods-trader category  $g$ ;  $s$  is firm size, firm age, or 4-digit NAICS; and  $t$  is year. We control for annual shocks to size, age, or sector group via fixed effects  $\delta_{st}$ . We include indicators for each goods-trader group to estimate the net job creation premia (or discount) with coefficients relative to the omitted non-trader category:  $\beta_{Exp}$ ,  $\beta_{Imp}$ ,  $\beta_{ExIm}$ . The regression is weighted by  $X_{gst}$  to account for the importance, in terms of employment, of each goods-trader group within a category  $s$  in year  $t$ . This weighting approach exploits a useful aggregation property of the DHS growth rate measures where the  $X_{gst}$  weighted average over the categorical subsets  $s$  is the aggregate net growth  $NETJCR_{gt}$ .<sup>12</sup> We report robust standard errors.

We initially estimate Equation (8) on the aggregate economy-wide data. In this sample, we can only include year fixed effects and the goods-trader indicators are also the panel identifier fixed effects. We present results in Table 11. The first column displays the average net job creation rates by the three goods-trader groups relative to non-traders for the U.S. economy. As discussed in Section 5.1, there is a large importer net job creation premium over non-traders, a small but insignificant exporter premium and a discount for exporter-

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<sup>12</sup>Specifically,  $NETJCR_{gt} = \frac{1}{\sum_s X_{gst}} \sum_s X_{gst} NETJCR_{gst}$ . Likewise,  $NETJCR_t$  is the weighted average over all goods-trader type  $g$ .

importers relative to non-traders. The constant term captures the average net job creation rates for non-traders. These coefficients corroborate the patterns in Figure 3.

Does the firm size composition explain the job creation premia among goods-traders? The second column of Table 11 includes the controls in Equation 8 for size $\times$ year effects using the BDS-Goods Traders firm size tables. The importer only premia is robust to these controls and the exporter only category becomes large and significant relative to the omitted non-trader group. The negative coefficient associated with exporter-importer firms becomes small and statistically insignificant. It is well-known that large firms have slower employment growth than smaller or medium sized firms (Haltiwanger, Jarmin and Miranda, 2013). Once we control for firm size, we are comparing goods traders' job creation to similarly sized non-trading firms. With inclusion of size $\times$ year comparison groups, the coefficients on the goods-trader premium increase.

We find positive and significant net job creation premium for all goods-traders once we control for firm age. The third column in Table 11 estimates Equation 8 with age $\times$ year fixed effects using the BDS-Goods Traders firm age table. Controlling for firm age reveals that all three types of goods-traders display higher net job creation rates than non-traders. Firms that both export and import now exhibit statistically significantly higher net job creation rates than non-traders. Importer only firms continue to display the highest average net job creation premium.

Is the goods-trader employment growth premia a recent phenomenon or does it hold over the short- and long-run? As shown in Table 3, employment is skewed toward older firms among goods-traders, especially exporter-importers. Given the important role of age controls, we explore it further in semi-parametric analysis through time. We drop the goods-trader indicators from Equation (8) and regress net job creation rates on indicators for the five age categories. We then run a local polynomial regression of the residuals on the year variable for each firm type. We plot the results in Figure 6 with 95% confidence intervals. We find the goods-trader premia is robust over time and not driven by any particular year or time period in the sample. We discuss the implications of this premium in more detail in Section 6.

Our results contribute to and reinforce the findings of Haltiwanger et al. (2013), who established the importance of controlling for firm age to understand the relationship between firm size and net employment growth. Because the BDS-Goods Traders does not contain size by age cross-tabulation statistics for trader types, we implement a close approximation that may be useful for future researchers in other applications. We take the annual shares of employment by each goods-trader and age category type that we reported in Table 3 and treat the shares as time-varying controls for the age distribution by trader type. Then we

re-estimate Equation 8 on the size tables as in column (2) including the age share controls.<sup>13</sup> These regressions show that all types of goods-traders have higher net job creation rates than non-traders in contrast to the results in column (2). This proxy strategy only imperfectly recovers a noisy, positive effect for importer-exporters. Nevertheless, it may be useful in other contexts with the caveat that we are including potentially endogenous contemporaneous employment levels as explanatory variables where employment growth is the dependent variable.

In sum, we find goods-traders exhibit higher net job creation rates than non-traders controlling for age. Importer only firms consistently display the highest average rates. Exporter-importers, controlling for age, also exhibit a strong advantage in net job creation. These findings are at odds with a common, popular conception that exporting is positive for job growth, which we confirm, but importing is not, which we reject in the aggregate. We explore this further in the next section by looking at the sectoral composition of goods-traders' employment growth over time.

### 5.3 Role of Industry

We use the BDS-Goods Traders sector table to show that the goods-trader net job creation premium persists even after controlling for sector by year fixed effects. In broad sector level analysis, we show that the goods-traders premia are prevalent in sectors that represent large shares of domestic employment - especially manufacturing, wholesale, and retail.

We begin by combining the goods-trading firms into a “trader” group—summing together importer only, exporter only and exporter-importers—to reduce the dimensionality of the data. We then compute aggregate net job creation rates in four mutually exclusive cross-tabulations by year: (1) non-traders in goods-producing industries, (2) goods-traders in goods-producing industries, (3) goods-traders in services-providing industries, and (4) non-traders in services-providing industries.

Figure 7 shows that goods-traders exhibit consistently higher net employment growth beginning in 2007 in both goods-producing and services-providing industries. Net employment growth in the goods-producing sector during the 2008-2009 global financial crisis suggest that although both types of firms experienced net job losses, goods-traders' job losses were smaller. One reason for goods-traders' superior performance may be due to their ability to diversify and smooth out the demand shocks across both domestic and foreign markets (Kurz

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<sup>13</sup>The five categories sum to unity by definition, so we omit births to avoid multi-collinearity. Note that the constant in this regression no longer shows the average net job creation rate for non-traders due to inclusion of the age controls.

and Senses, 2016). The drop in net job creation rates at traders and non-traders in 2016 reflects the overall deceleration in the U.S. economy between 2015 and 2016, which was more pronounced in the petroleum and manufacturing industries in the goods-producing sector (Bureau of Economic Analysis, 2017). But from 2017-2019, goods-traders' net employment growth rebounded more and the gap with non-traders widened. The difference between goods-traders and non-traders remained positive in the services-providing sector.

To better understand these aggregate patterns and control for domestic and global industry specific shocks, we estimate Equation 8 on BDS-Goods Trader sector table where  $\alpha_{st}$  are controls for four-digit NAICS by year fixed effects. While the sector statistics do not include firm size and firm age characteristics we controlled for in Section 5.2, trader( $g$ )-industry( $s$ )-year( $t$ ) level observations mean that the sector sample size is 55 to 277 times larger than the more aggregated samples (economy-wide, firm size, firm age) used in Table 11. We can obtain greater precision on our estimates and control for unobservable industry-year supply and demand shocks.

We organize these results in Table 12 as follows. The first column reports the average share of total U.S. employment by the broad sector classifications. The next three columns display the coefficients on the three types of goods-traders,  $\beta_{Exp}$ ,  $\beta_{Imp}$ , and  $\beta_{ExIm}$ , and the number of observations in each sample. The  $\beta$  coefficients are relative to non-traders. The first row shows the results across all four-digit NAICS and then the remaining rows report results within broad sectors. All regressions include four-digit NAICS by year fixed effects and reports robust standard errors.

We confirm a robust goods-trader net job creation premium in the industry sample and show that it holds for a large share of employment in sector level regressions. Focusing on the first row, where we pool the sample across all 4-digit industries, we find that all three types of goods-traders have a positive coefficient, i.e. goods-traders display higher net job creation rates than non-traders. Relative to non-traders, average net job creation rate is about 1pp higher at exporter only firms; about 2pp higher at importer-only firms; and about 0.50 pp higher at exporter-importer firms.

The sector level results show wide variation in the goods-trader premium, but are uniformly positive for all trader types for more than half of U.S. employment. Among goods-producing industries there is a strong premium for exporters and importers in agriculture and mining, construction, and manufacturing but the importer-exporter premium is only positive in the manufacturing sector. In the services-providing sector, we find the trader job creation premium is positive and significant for all trader types in the wholesale and retail sectors. These three sectors (manufacturing, wholesale, and retail) account for 30% of non-farm, private sector employment. At least one or more types of goods-traders display

higher net job creation rates across all sectors compared to non-traders.<sup>14</sup>

## 6 What the Evidence Suggests So Far

Evidence of the strong performance of traders relative to non-traders in net job creation for manufacturing, wholesale, and retail, motivates a deeper-dive into the data in these three sectors. We then discuss the sector-specific patterns in the context of the broader patterns of job creation in the BDS-Goods Traders economy-wide, size, and age statistics.

Starting with the manufacturing sector, Figure 8 plots the average net job creation rates over 4-digit industries at traders and non-traders. Overall, goods-traders displayed higher net employment growth with a much higher premia in years after 2006 mirroring patterns in the goods-producing sector in Figure 7.

These patterns combined with the finding that goods-traders' contribution to net job creation differs systematically across three main time periods in the series (1992-2000, 2001-2007, and 2008-2019) hint at major reorganization of goods-trader's activities, especially between 2001 and 2007. First, the 2001-2007 period is notable for China's 2001 accession to the WTO, which reduced uncertainty about China's access to U.S. markets (Handley and Limao, 2017). The subsequent surge in Chinese import growth has been linked to the sharp drop in U.S. manufacturing employment beginning in 2000 (Autor, Dorn and Hanson, 2013; Pierce and Schott, 2016). Second, during this transition period we begin to see differences in employment growth rates between traders and non-traders that becomes more distinct at the onset of the Great Recession. From about 1999 to 2010, manufacturing employment growth at traders and non-traders is negative on average. But while non-traders continue to shrink, the goods-trading manufacturers exhibit positive net job creation from 2011-2019. Third, total manufacturing employment increased by about 10% from 2011-2019. Because the share of goods-traders in manufacturing employment averages 84% (see Table 5) this recovery would not have occurred if all manufacturers grew at the same (negative) rate as non-trading firms.

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<sup>14</sup>The only exception is the utilities sector where there appears to be a goods-trader discount. We caution against placing too much importance on the agriculture, mining and natural resources sectors or utilities. First, these sectors are uniquely subject to periodic volatility and shocks to commodity or energy prices. Utilities and natural resources are also heavily regulated. Second, each of these sectors is only 1% of total non-farm, private sector employment and the samples are fairly small. Furthermore, employment in parts of the agriculture industry (e.g. agricultural services, forestry, fishing, and hunting) is out of scope of the LBD.

What can explain the divergence in employment growth between goods-traders and non-traders in manufacturing? We posit a “survive, then thrive” narrative for firms that successfully adapted to the challenges of globalization.

- First, firms that participate in international trade, especially exporting, are more likely to have higher employment growth (Bernard and Jensen, 1999). This is consistent with our findings in Section 5.1 that goods-traders are more likely to grow on the extensive margin—net job creation at new establishments—relative to non-trading goods-producers.
- Second, direct imports may have enabled manufacturing goods-traders to access cheaper inputs, raise output, and thus survive Chinese import competition and other negative shocks. The higher job growth at importers (importer only and exporter-importer firms) we document in Section 5 is consistent with imported goods and labor being complements in production.
- Third, Chinese import penetration was highest in labor-intensive manufacturing sectors such as apparel, leather, and furniture where imports were more likely to substitute for domestic labor. Goods-traders, however, tend to be concentrated in technology-intensive sectors. Using BDS-Goods Traders sector tables and the definition of technology-intensive sectors in Goldschlag and Miranda (2020), we find that 93% of employment in the high-tech sector is at goods-trading firms.

In sum, non-traders were more likely to be marginal firms directly and negatively impacted by import competition than goods-traders. The longevity of goods-traders documented in Table 3 suggest that traders who adjusted to these shocks and survived the downturn in 2008-2009 were more resilient.

In the retail (Figure 9) and wholesale trade (Figure 10) sectors, goods-traders are driving net job creation. Goods-traders display higher employment growth in all years over the approximately three decades. But similar to manufacturing patterns, non-trader employment growth is more likely to be negative, especially after 2007 and in the wholesale sector.

We make the following observations from these patterns about transformation in the service-providing sector of the U.S. economy.

- First, because goods-traders represent 60% of retail and 70% of wholesale trade employment, job growth in these sectors is tied to international trade participation. While service-providers may not be directly engaged in goods production, many of their activities support goods-traders such as goods intermediation by the wholesale trade sector

and transportation and warehousing of merchandise. The observed job creation in the services-providing sector may thus support domestic manufacturing activity.<sup>15</sup>

- Second, although we cannot rule out the possibility that service sector importers, especially of final goods in the retail sector, could displace workers at domestic producers in the manufacturing sector, the slower job growth at non-traders in the retail and wholesale trade sectors suggests more research is needed to understand the source of differences in employment growth at traders and non-traders. Do the non-trading firms lack the information or scale needed to access international markets directly? Are services-providing non-traders engaged in business activities that are primarily local and domestic?
- Third, the growing importance of goods-traders in the services-providing sector strongly suggest a process of Schumpeterian creative destruction: the opening of new markets and new forms of organization. The higher contribution to employment growth rates by goods-traders through job creation at new establishments (births) compared to non-traders is consistent with new opportunities being created for *domestic* job creation in retail, wholesale, and other services that may not have existed in the absence of trade participation.

## 7 Concluding Remarks

This paper describes the first experimental, public-use product extending the Business Dynamics Statistics program at the U.S. Census Bureau—BDS-Goods Traders. These statistics describe the business dynamics of goods trading firms in the U.S. economy. The BDS-Goods Traders is the first in a set of public-use statistics developed under the broader research agenda of constructing business dynamics statistics of globally engaged firms—BDS-GEF. Under this research agenda, firm’s global engagement is defined along three main dimensions: trade in goods, trade in services, foreign direct investment. The Center for Economic Studies at the U.S. Census Bureau jointly with the U.S. Bureau of Economic Analysis (BEA) is actively developing the data infrastructure to identify services traders and multination-

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<sup>15</sup>In related work, Bloom, Handley, Kurmann and Luck (2019) find that job loss from exposure to Chinese import competition is mitigated at establishments which are part of firms that import and export. They also find that manufacturing job loss is partially offset by firms that expand in the services sector even as they shrink their manufacturing footprint.

als in the BR.<sup>16</sup> The BDS-GEF will extend our view of U.S. business dynamics along key dimensions of firms’ participation in global markets.

We present several findings using BDS-Goods Traders. Goods-traders, on average, account for 6% of all firms but half of total employment in the U.S. economy. Firms that both export and import are even rarer and account for the bulk of employment associated with traders. Moreover, goods-traders are unlikely to shutdown demonstrated by extremely low (2%) shares of firm deaths and share of establishments and employment associated with firm deaths. These share are very stable over time.

Goods-traders are the largest firms in the economy. Large firms account for 90% of employment at firms that both export and import; this share is about 60% for exporter only and importer only firms but only a fifth for non-traders. Goods-traders also tend to be older than non-traders. Firms born prior to 1977 account for over three-quarters of employment at firms that both export and import; this share is 50% for exporter only and importer only firms but only 28% for non-traders. Although goods-traders represent over 80% of manufacturing employment, the manufacturing sector has a relatively low share of the total employment at goods-traders. Between 1992 and 2019, the share of employment at goods-traders declined in goods-producing industries and increased in services-providing industries.

Goods-traders exhibit higher net job creation rates than non-traders especially controlling for firm age. All three types of goods-exporter exhibit 3-5pp higher net job creation rates than non-traders in manufacturing, wholesale, and retail—sectors that collectively account for almost a third of total U.S. employment. Importer only firms display the highest average rates among goods-traders across different firm size classes, firm age classes, and sectors. Goods-traders’ contribution to total net job creation is increasing over time and makes up more than half of employment growth after 2007.

Our analysis suggests that goods-traders adjustments to global shocks precipitated by China’s 2001 accession to the WTO made them more resilient to future shocks like the 2008-2009 global financial crisis. In the goods-producing sector, the divergence in manufacturing employment growth between goods-traders and non-traders especially after 2007 is consistent with direct imports enabling manufacturing goods-traders to access cheaper inputs, raise output, and survive the 2001 Chinese import competition and other negative shocks. The

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<sup>16</sup>The data infrastructure entails links between BEA’s surveys on multinational operations and services trade to the Census Bureau’s BR. The confidential multinational crosswalks (Kamal, McCloskey and Ouyang, 2020) are available to qualified researchers on approved projects through the Federal Statistical Research Data Centers (FSRDC). The services crosswalks will also be similarly made available when completed. U.S. Census Bureau (2021a) provides information on the application process.

prevalence of the Chinese import competition shock in more labor-intensive industries like apparel and leather coupled with the dominance of goods-traders in technology-intensive sectors suggest that non-traders were more likely to be directly and negatively impacted by Chinese import competition. In the services-providing sector, the importance of goods-traders to net job creation is consistent with creation of new opportunities for domestic job creation tied to participation in international markets.

The BDS-Goods Traders statistics offer the first comprehensive view of goods-traders' contribution to employment growth and firm dynamics in the overall economy and across firm size, firm age, divisions, and detailed sectors. We document the growing importance of goods-traders in overall net job creation and the increasing share of goods-traders' employment in service-providing industries. These findings merit a deeper investigation into the nature and scope of goods-traders' employment changes. For example, how many establishments were closed in the goods-producing sector and opened in the services-providing sector? How much employment was associated with the entering and exiting establishments? How much of the employment growth effects can be attributed to direct import competition from China versus greater market access to foreign inputs and sources of demand? The Census Bureau is actively working on extending the time series and examining additional extensions (such as incorporating destination or source country information in the goods-trader classification) in future releases of the BDS-Goods Traders.

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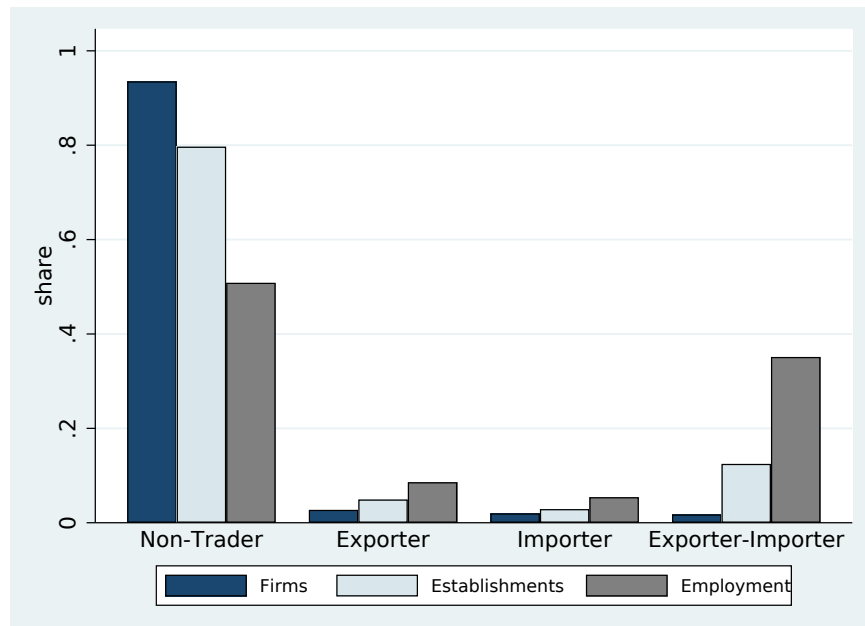
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# Figures

**Figure 1. Share of Firms, Establishments, & Employment by Trader Status  
U.S. Economy, Average 1992-2019**

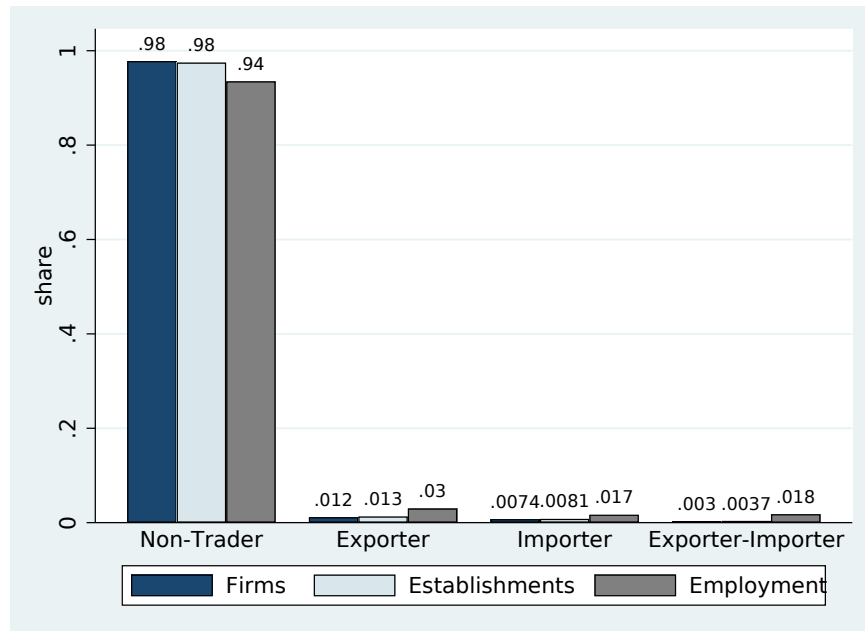


**Notes:** This figure plots the average share of firms, establishments, and employment in the U.S. economy over 1992-2019 by four mutually exclusive goods-trading classifications (defined in Section 2.2.1).

“Non-Trader” are firms that neither export nor import goods in year  $t$ ; “Exporter” are firms that only export goods in year  $t$ ; “Importer” are firms that only import goods in year  $t$ ; “Exporter-Importer” are firms that both export and import goods in year  $t$ .

**Source:** Author’s calculations using BDS-Goods Traders economy-wide table.

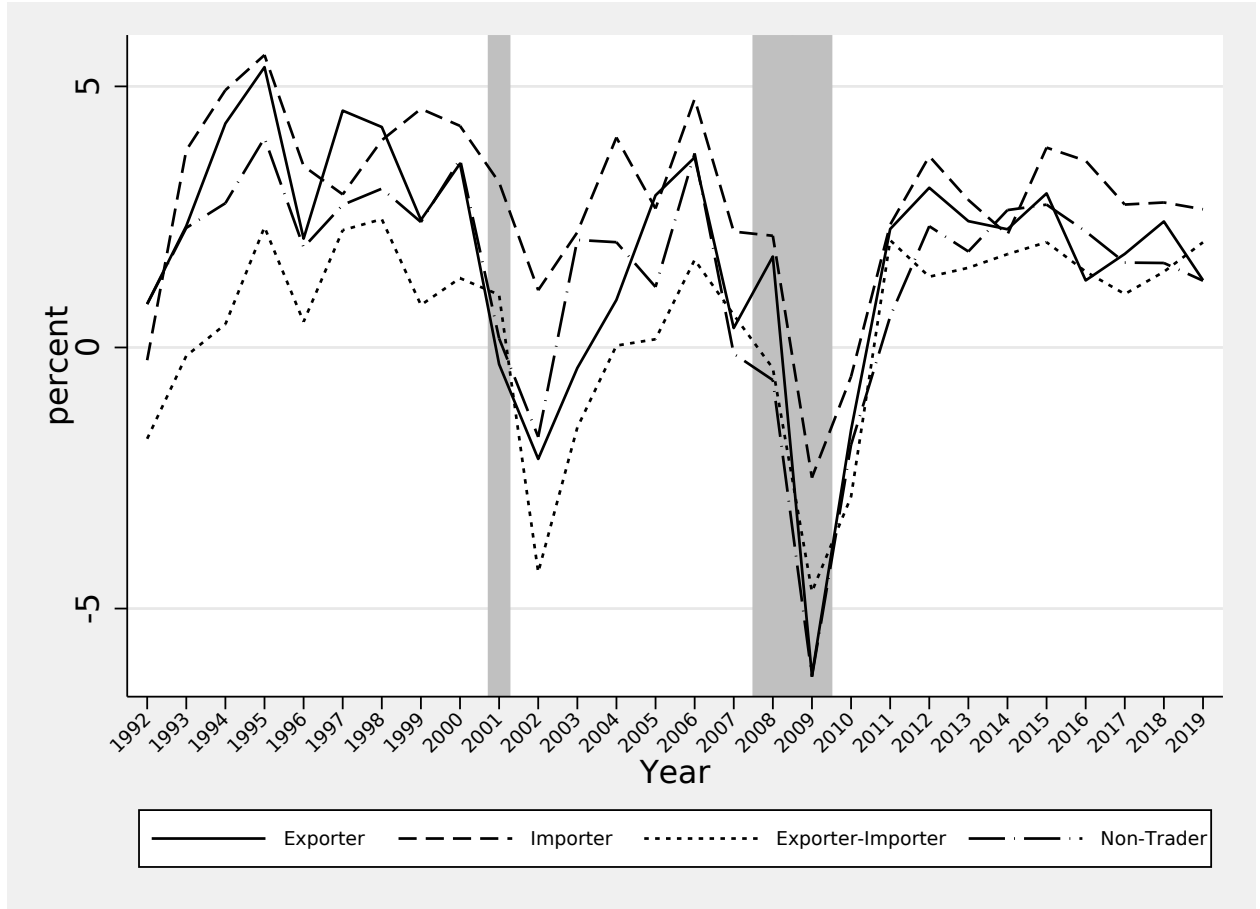
**Figure 2. Share of Firms, Establishments, & Employment due to Firm Deaths by Trader Status**  
**U.S. Economy Average 1992-2019**



**Notes:** This figure plots the average share of firms, establishments, and employment due to firm deaths in the U.S. economy over 1992-2019 by four mutually exclusive goods-trading classifications (defined in Section 2.2.1). “Non-Trader” are firms that neither export nor import goods in year  $t$ ; “Exporter” are firms that only export goods in year  $t$ ; “Importer” are firms that only import goods in year  $t$ ; “Exporter-Importer” are firms that both export and import goods in year  $t$ .

**Source:** Author’s calculations using BDS-Goods Traders economy-wide table.

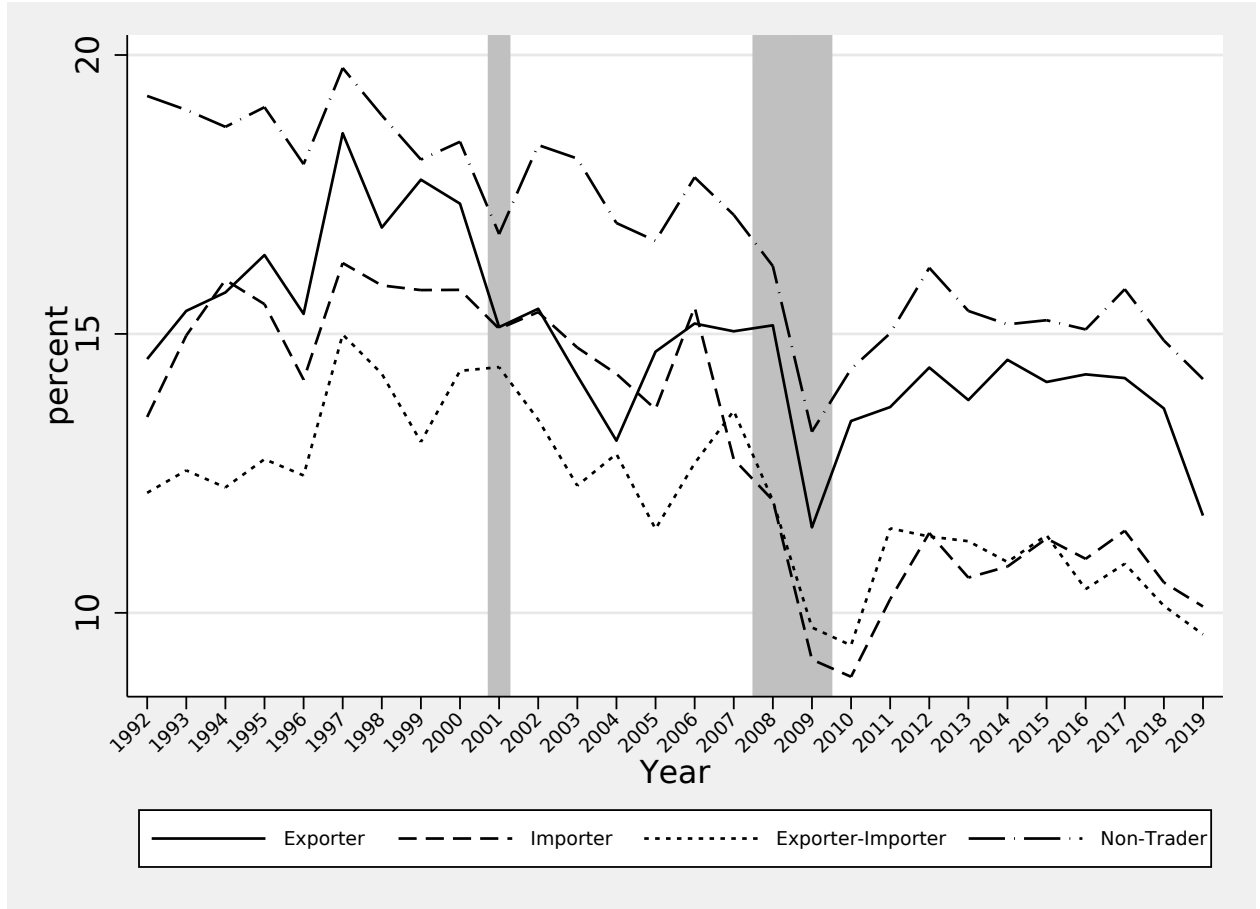
**Figure 3. Net Job Creation Rates by Trader Status  
U.S. Economy 1992-2019**



**Notes:** This figure plots annual net job creation rates by four mutually exclusive goods-trading classifications (defined in Section 2.2.1). “Exporter” are firms that only export goods in year  $t$ ; “Importer” are firms that only import goods in year  $t$ ; “Exporter-Importer” are firms that both export and import goods in year  $t$ ; “Non-Trader” are firms that neither export nor import goods in year  $t$ . Shaded areas represent periods of recessions (National Bureau of Economic Research, 2021).

**Source:** Author’s calculations using BDS-Goods Traders firm size table.

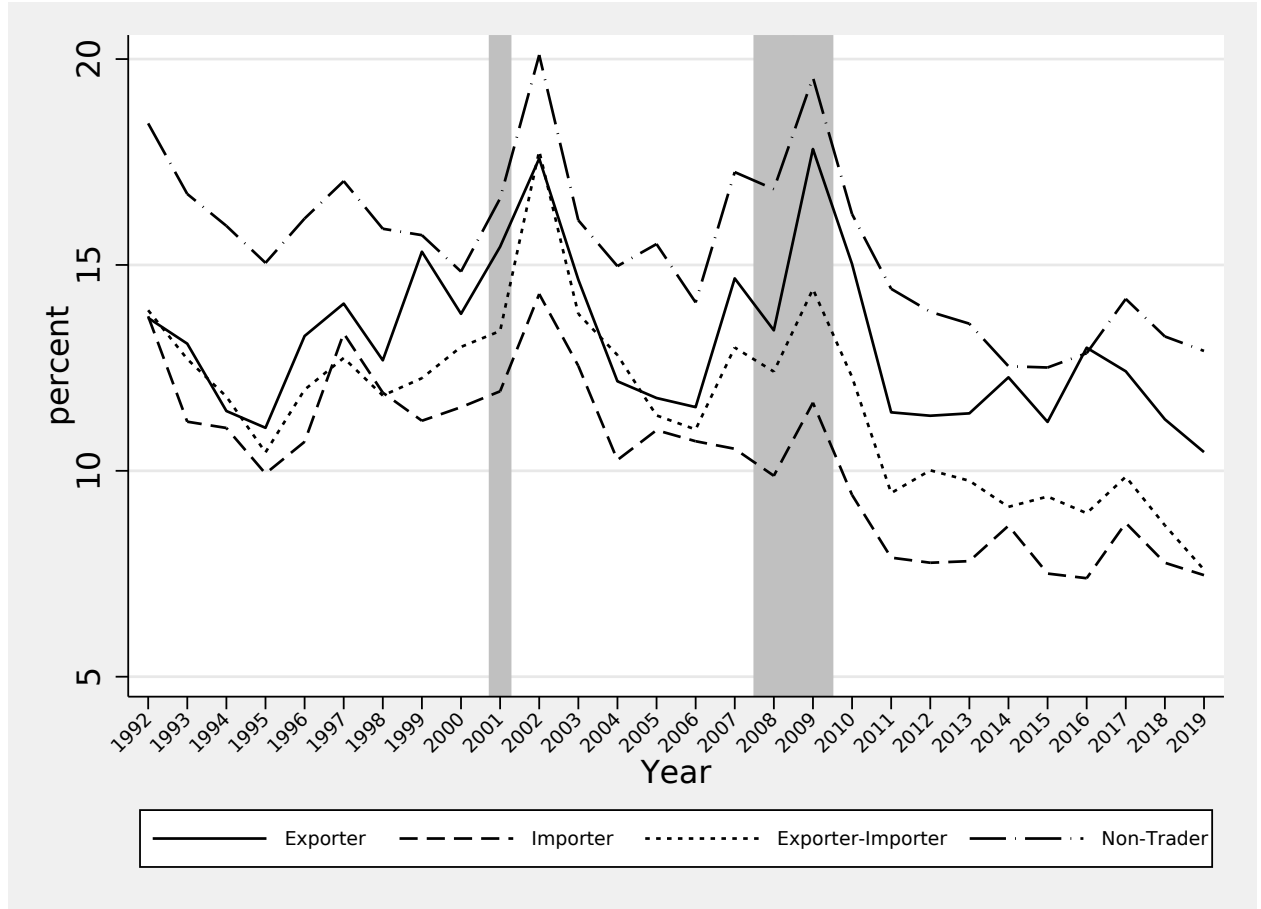
Figure 4. Job Creation Rates by Trader Status  
U.S. Economy 1992-2019



**Notes:** This figure plots annual job creation rates by four mutually exclusive goods-trading classifications (defined in Section 2.2.1). “Exporter” are firms that only export goods in year  $t$ ; “Importer” are firms that only import goods in year  $t$ ; “Exporter-Importer” are firms that both export and import goods in year  $t$ ; “Non-Trader” are firms that neither export nor import goods in year  $t$ . Shaded areas represent periods of recessions (National Bureau of Economic Research, 2021).

**Source:** Author’s calculations using BDS-Goods Traders economy-wide table.

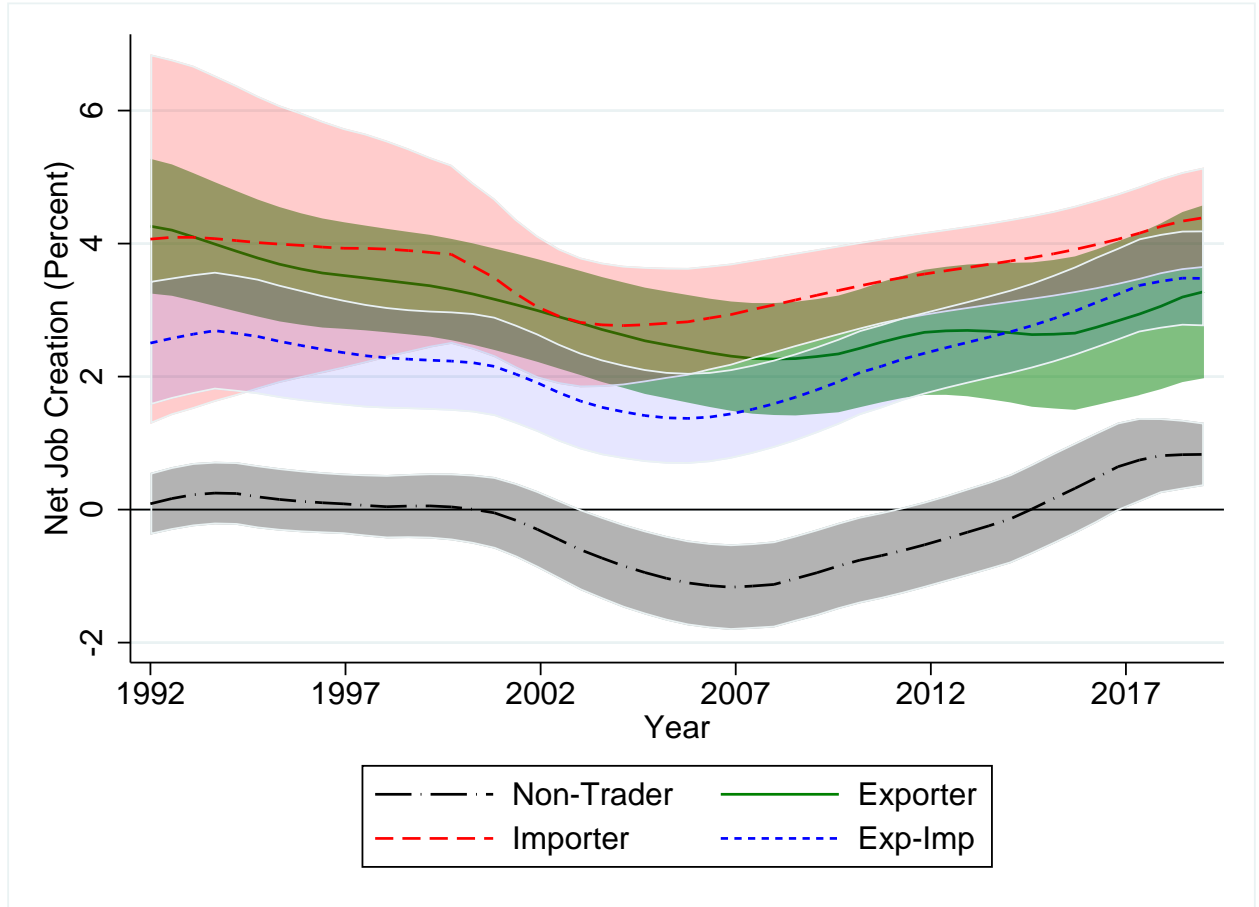
**Figure 5. Job Destruction Rates by Trader Status  
U.S. Economy 1992-2019**



**Notes:** This figure plots annual job destruction rates by four mutually exclusive goods-trading classifications (defined in Section 2.2.1). “Exporter” are firms that only export goods in year  $t$ ; “Importer” are firms that only import goods in year  $t$ ; “Exporter-Importer” are firms that both export and import goods in year  $t$ ; “Non-Trader” are firms that neither export nor import goods in year  $t$ . Shaded areas represent periods of recessions (National Bureau of Economic Research, 2021).

**Source:** Author’s calculations using BDS-Goods Traders economy-wide table.

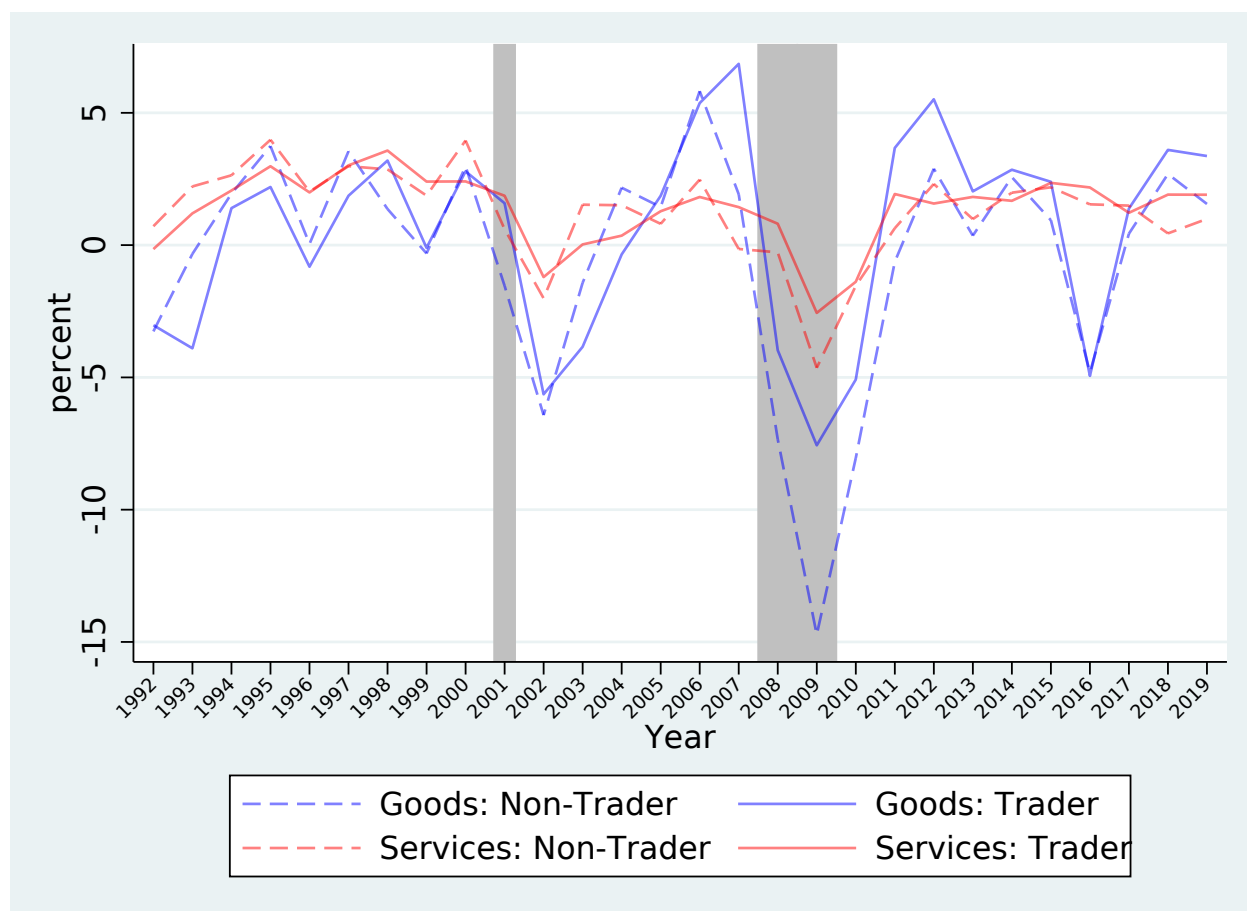
**Figure 6. Semi-Parametric Estimates of Net Job Creation Rates by Trader Status:  
Conditional on Age Controls, 1992-2019**



**Notes:** Local polynomial regression of net job creation rates over time after controlling for firm age category fixed effects. Residuals re-centered around overall mean net job creation rate in sample. Shaded areas are 95% confidence intervals. “Exporter” are firms that only export goods in year  $t$ ; “Importer” are firms that only import goods in year  $t$ ; “Exporter-Importer” are firms that both export and import goods in year  $t$ ; “Non-Trader” are firms that neither export nor import goods in year  $t$ .

**Source:** Author’s calculations using BDS-Goods Traders firm age table.

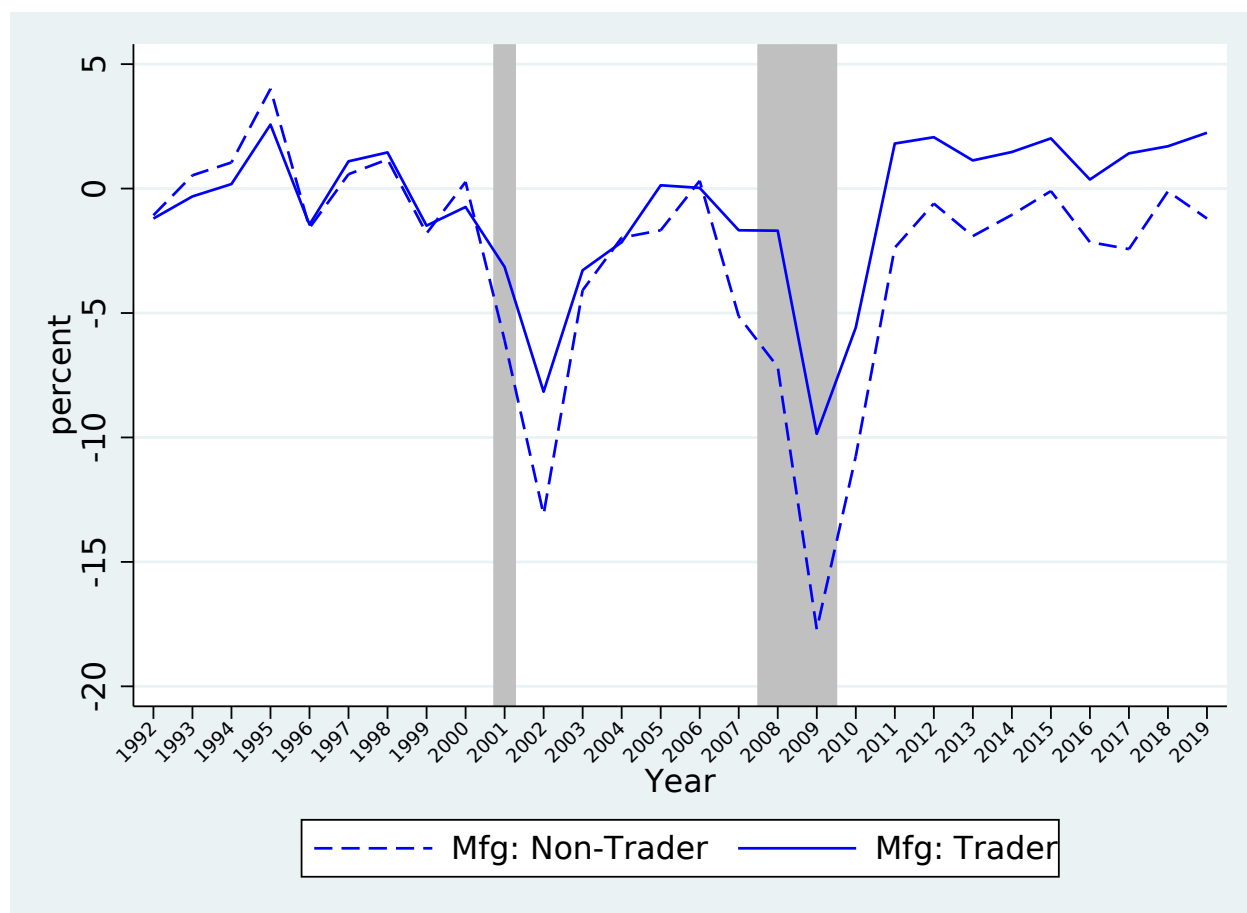
**Figure 7. Net Job Creation Rates in “Goods-Producing” & “Services-Providing” Sectors  
Traders vs. Non-Traders**



**Notes:** This figure plots annual net job creation rates for goods-traders (“Trader”) and non-traders (“Non-Trader”) in “Goods-Producing” (“Goods”) and “Services-Providing” (“Services”) sectors defined by Bureau of Labor Statistics (2021). Shaded areas represent periods of recessions (National Bureau of Economic Research, 2021).

**Source:** Author’s calculations using BDS-Goods Traders sector table.

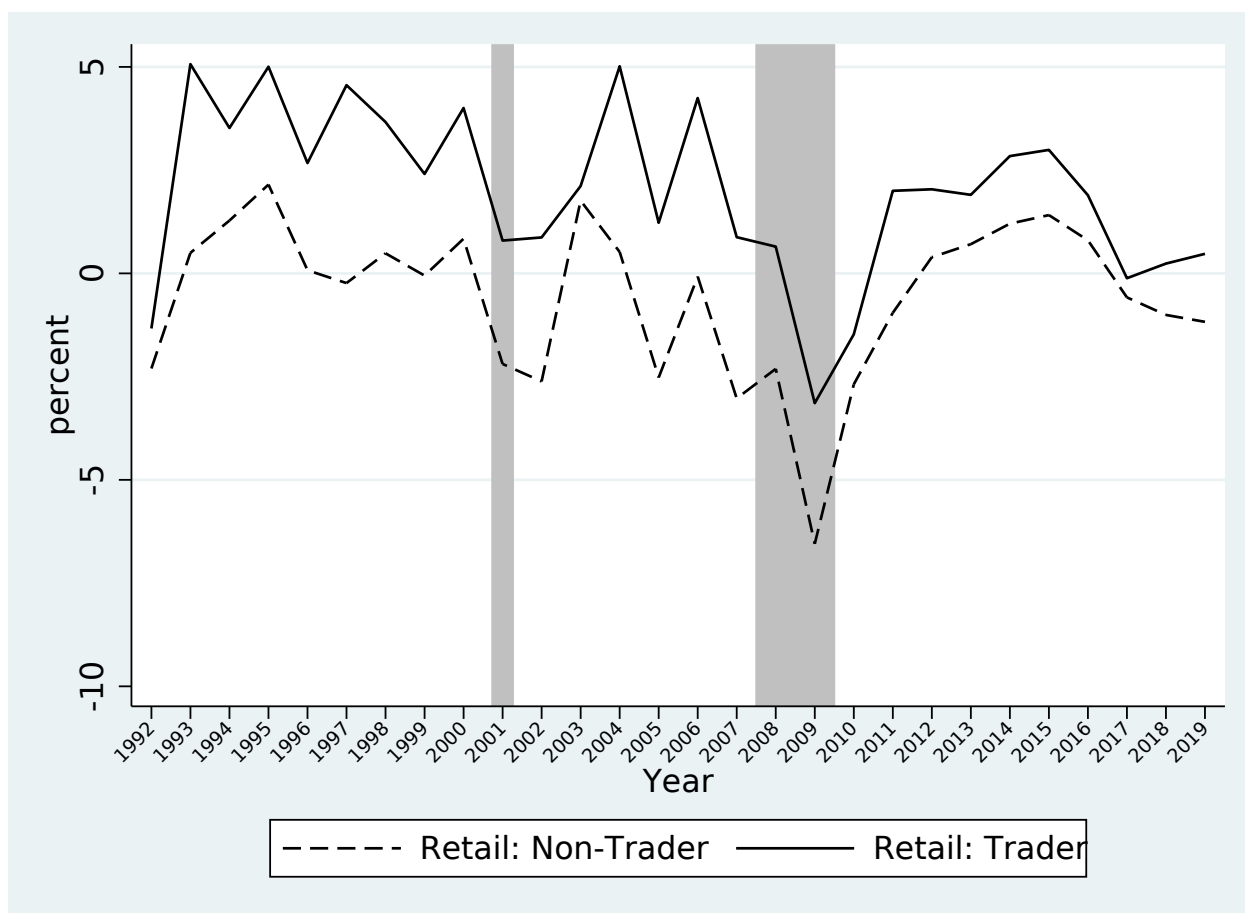
**Figure 8. Net Job Creation Rates in Manufacturing: Traders vs. Non-Traders**



**Notes:** This figure plots annual, average net job creation rates for goods-traders (“Trader”) and non-traders (“Non-Trader”) in the manufacturing sector (NAICS 31-33). Averages computed over 4-digit NAICS subsectors. Shaded areas represent periods of recessions (National Bureau of Economic Research, 2021).

**Source:** Author’s calculations using BDS-Goods Traders sector table.

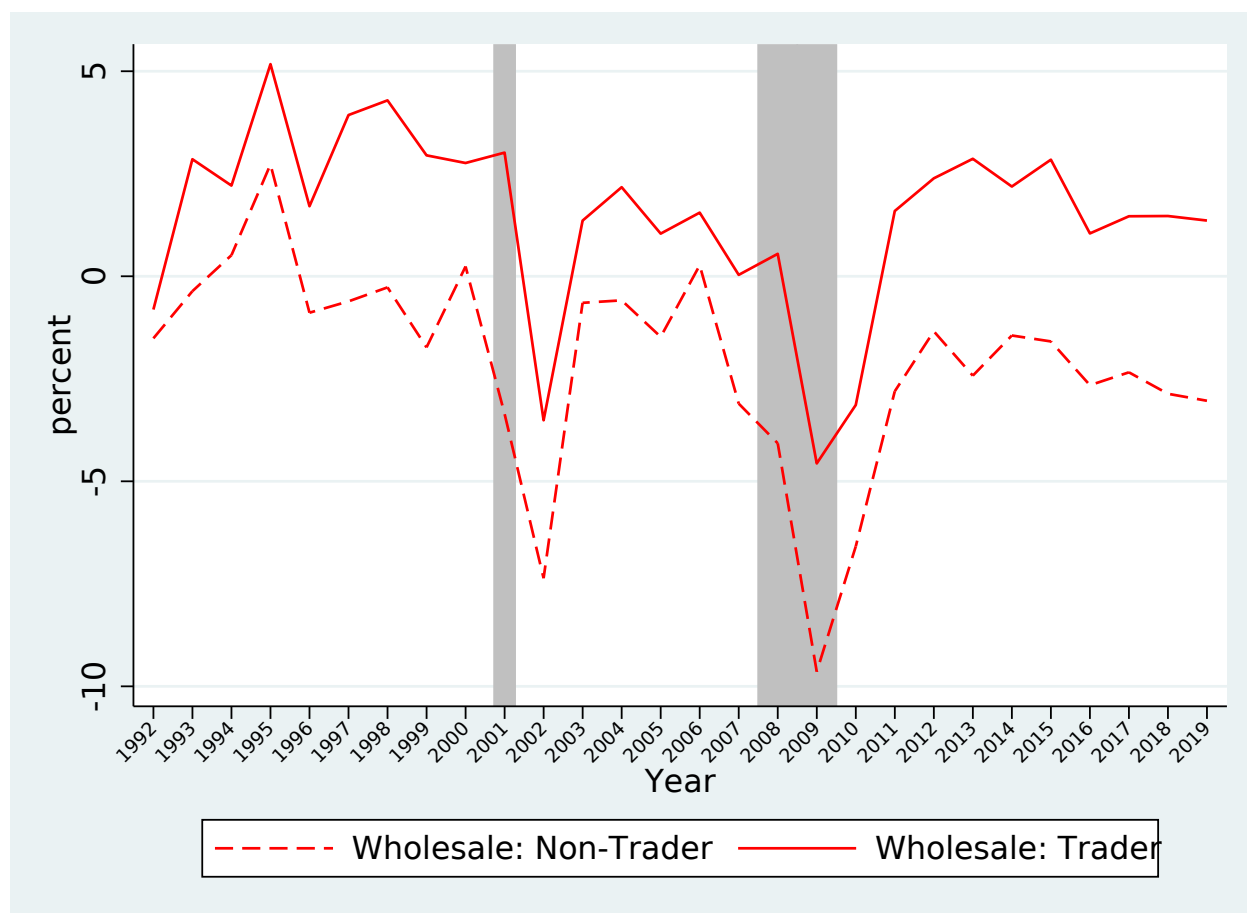
**Figure 9. Net Job Creation Rates in Retail Trade: Traders vs. Non-Traders**



**Notes:** This figure plots annual, average net job creation rates for goods-traders (“Trader”) and non-traders (“Non-Trader”) in the retail trade sector (NAICS 44-45). Averages computed over 4-digit NAICS subsectors. Shaded areas represent periods of recessions (National Bureau of Economic Research, 2021).

**Source:** Author’s calculations using BDS-Goods Traders sector table.

**Figure 10. Net Job Creation Rates in Wholesale Trade: Traders vs. Non-Traders**



**Notes:** This figure plots annual, average net job creation rates for goods-traders (“Trader”) and non-traders (“Non-Trader”) in the wholesale trade sector (NAICS 45). Averages computed over 4-digit NAICS subsectors. Shaded areas represent periods of recessions (National Bureau of Economic Research, 2021).

**Source:** Author’s calculations using BDS-Goods Traders sector table.

# Tables

**Table 1. Share of Employment at Traders, By Firm Size**

	Non-Trader	Exporter	Importer	Exporter-Importer
Small	0.93	0.03	0.02	0.02
Medium	0.75	0.08	0.05	0.11
Large	0.19	0.11	0.07	0.63

**Notes:** This table shows the employment in four mutually exclusive goods-trading classifications (defined in Section 2.2.1) as a share of total employment in a firm size class (defined in Section 2.3). “Non-Trader” are firms that neither export nor import goods in year  $t$ ; “Exporter” are firms that only export goods in year  $t$ ; “Importer” are firms that only import goods in year  $t$ ; “Exporter-Importer” are firms that both export and import goods in year  $t$ . “Small” defines firms that employ 1- 19 workers; “Medium” defines firms that employ 20-499 workers; and “Large” defines firms that employ 500+ workers. Each row sums to 1.

**Source:** Authors’ calculations using BDS-Goods Traders firm size table.

**Table 2. Share of Employment in a Firm Size Category, by Trader Status**

	Non-Trader	Exporter	Importer	Exporter-Importer
Small	0.35	0.08	0.09	0.01
Medium	0.46	0.33	0.34	0.10
Large	0.19	0.60	0.57	0.90

**Notes:** This table shows the employment in three firm size classes (defined in Section 2.3) as a share of total employment in a goods-trading classification (defined in Section 2.2.1). “Non-Trader” are firms that neither export nor import goods in year  $t$ ; “Exporter” are firms that only export goods in year  $t$ ; “Importer” are firms that only import goods in year  $t$ ; “Exporter-Importer” are firms that both export and import goods in year  $t$ . “Small” defines firms that employ 1- 19 workers; “Medium” defines firms that employ 20-499 workers; and “Large” defines firms that employ 500+ workers. Each column sums to 1.

**Source:** Authors’ calculations using BDS-Goods Traders firm size table.

**Table 3. Share of Employment in a Firm Age Category, by Trader Status**

	Non-Trader	Exporter	Importer	Exporter-Importer
Births	0.04	0.01	0.01	0.00
1 to 5	0.18	0.06	0.08	0.02
6 to 10	0.15	0.08	0.08	0.03
11+	0.35	0.35	0.31	0.19
Left Censored	0.28	0.50	0.52	0.76

**Notes:** This table shows the employment in five firm age classes (defined in Section 2.3) as share of total employment in a goods-trading classification (defined in Section 2.2.1). “Non-Trader” are firms that neither export nor import goods in year  $t$ ; “Exporter” are firms that only export goods in year  $t$ ; “Importer” are firms that only import goods in year  $t$ ; “Exporter-Importer” are firms that both export and import goods in year  $t$ . “Births” defines firms that are 0 years; “Left Censored” defines firms that are born before 1977. Each column sums to 1.

**Source:** Authors’ calculations using BDS-Goods Traders firm age table.

**Table 4. Share of Employment at Traders, by Firm Age**

	Non-Trader	Exporter	Importer	Exporter-Importer
Births	0.92	0.04	0.02	0.02
1 to 5	0.87	0.05	0.03	0.05
6 to 10	0.79	0.07	0.04	0.10
11+	0.63	0.09	0.06	0.22
Left Censored	0.29	0.09	0.06	0.56

**Notes:** This table shows the employment in four mutually exclusive goods-trading classifications (defined in Section 2.2.1) as a share of total employment in a firm age class (defined in Section 2.3). “Non-Trader” are firms that neither export nor import goods in year  $t$ ; “Exporter” are firms that only export goods in year  $t$ ; “Importer” are firms that only import goods in year  $t$ ; “Exporter-Importer” are firms that both export and import goods in year  $t$ . “Births” defines firms that are 0 years; “Left Censored” defines firms that are born before 1977. Each row sums to 1.

**Source:** Authors’ calculations using BDS-Goods Traders firm age table.

**Table 5. Share of Employment at Traders, by Sector**

	Non-Trader	Exporter	Importer	Exp.-Imp.
<b>Goods-Producing Industries</b>				
Agriculture & Mining	0.45	0.08	0.05	0.42
Construction	0.80	0.05	0.06	0.09
Manufacturing	0.16	0.10	0.03	0.70
<b>Services-Providing Industries</b>				
Retail	0.38	0.05	0.06	0.51
Transportation	0.36	0.07	0.04	0.53
Utilities	0.17	0.12	0.06	0.66
Wholesale	0.29	0.10	0.08	0.52
Information	0.25	0.10	0.04	0.61
Finance, Insurance, Real Estate	0.50	0.13	0.04	0.34
Administrative	0.66	0.12	0.03	0.19
Management	0.15	0.08	0.05	0.72
Professional Services	0.61	0.08	0.04	0.28
Education	0.61	0.05	0.11	0.23
Health	0.68	0.11	0.08	0.13
Accommodation & Food	0.72	0.07	0.05	0.17
Arts	0.68	0.06	0.09	0.17
Other Services	0.84	0.04	0.03	0.09

**Notes:** This table shows the employment in four mutually exclusive goods-trading classifications (defined in Section 2.2.1) as a share of total employment in a broad sector (defined in Section 4.3. “Non-Trader” are firms that neither export nor import goods in year  $t$ ; “Exporter” are firms that only export goods in year  $t$ ; “Importer” are firms that only import goods in year  $t$ ; “Exporter-Importer” are firms that both export and import goods in year  $t$ . Broad sectors defined as a single or group of 2-digit NAICS as follows: Agriculture & Mining (NAICS 11, 23); Construction (NAICS ); Manufacturing (NAICS 31-33); Retail (NAICS 44, 45); Transportation (NAICS 48, 49); Wholesale (NAICS 42); Utilities (NAICS 22); Information (NAICS ); Finance, Insurance, Real Estate (NAICS 51); Administrative (NAICS 56); Management (NAICS 55); Professional Services (NAICS 54); Education (NAICS 61); Health (NAICS 62); Accommodation & Food (NAICS 72); Arts (NAICS 71); Other Services (NAICS 81, 92). “Goods-Producing” and “Services-Providing” defined by Bureau of Labor Statistics (2021). Each row sums to 1.

**Source:** Authors’ calculations using BDS-Goods Traders sector table.

**Table 6. Share of Employment in a Sector, by Trader Status**

	Non-Trader	Exporter	Importer	Exp.-Imp.
<b>Goods-Producing Industries</b>				
Agriculture & Mining	0.01	0.01	0.01	0.01
Construction	0.08	0.03	0.05	0.01
Manufacturing	0.04	0.14	0.10	0.25
<b>Services-Providing Industries</b>				
Retail	0.10	0.08	0.19	0.19
Transportation	0.03	0.03	0.02	0.06
Utilities	0.00	0.01	0.01	0.01
Wholesale	0.03	0.06	0.10	0.08
Information	0.01	0.03	0.02	0.05
Finance, Insurance, Real Estate	0.07	0.11	0.05	0.07
Administrative	0.10	0.12	0.04	0.04
Management	0.01	0.03	0.03	0.06
Professional Services	0.08	0.06	0.04	0.05
Health	0.19	0.16	0.16	0.05
Education	0.03	0.01	0.05	0.02
Accommodation & Food	0.14	0.09	0.09	0.05
Arts	0.02	0.01	0.03	0.01
Other Services	0.08	0.02	0.03	0.01

**Notes:** This table shows the employment in a broad sector (defined in Section 4.3 as a share of total employment in a goods-trading classification (defined in Section 2.2.1). “Non-Trader” are firms that neither export nor import goods in year  $t$ ; “Exporter” are firms that only export goods in year  $t$ ; “Importer” are firms that only import goods in year  $t$ ; “Exporter-Importer” are firms that both export and import goods in year  $t$ . Broad sectors defined as a single or group of 2-digit NAICS as follows: Agriculture & Mining (NAICS 11, 23); Construction (NAICS ); Manufacturing (NAICS 31-33); Retail (NAICS 44, 45); Transportation (NAICS 48, 49); Wholesale (NAICS 42); Utilities (NAICS 22); Information (NAICS ); Finance, Insurance, Real Estate (NAICS 51); Administrative (NAICS 56); Management (NAICS 55); Professional Services (NAICS 54); Education (NAICS 61); Health (NAICS 62); Accommodation & Food (NAICS 72); Arts (NAICS 71); Other Services (NAICS 81, 92). “Goods-Producing” and “Services-Providing” defined by Bureau of Labor Statistics (2021). Each column sums to 1.

**Source:** Authors’ calculations using BDS-Goods Traders sector table.

**Table 7. Share of Employment in a Broad Sector, by Trader Status  
1992 and 2019**

	Non-Trader	Exporter	Importer	Exp.-Imp.
<hr/> Employment Shares in 1992 <hr/>				
Goods-Producing	0.15	0.23	0.17	0.38
Services-Providing	0.85	0.77	0.83	0.62
<hr/> Employment Shares in 2019 <hr/>				
Goods-Producing	0.11	0.13	0.14	0.20
Services-Providing	0.89	0.87	0.86	0.80

**Notes:** This table shows the annual employment in a broad sector as a share of total employment in a goods-trading classification (defined in Section 2.2.1). “Non-Trader” are firms that neither export nor import goods in year  $t$ ; “Exporter” are firms that only export goods in year  $t$ ; “Importer” are firms that only import goods in year  $t$ ; “Exporter-Importer” are firms that both export and import goods in year  $t$ . “Goods-Producing” and “Services-Providing” defined by Bureau of Labor Statistics (2021).

**Source:** Authors’ calculations using BDS-Goods Traders sector table.

**Table 8. Share of Employment at Traders, by Division**

	Non-Trader	Exporter	Importer	Exporter-Importer
EN Central	0.49	0.09	0.05	0.37
ES Central	0.51	0.09	0.05	0.36
Mid-Atlantic	0.52	0.08	0.06	0.34
Mountain	0.53	0.08	0.05	0.33
New England	0.50	0.09	0.06	0.35
Pacific	0.51	0.09	0.06	0.34
South Atlantic	0.51	0.09	0.05	0.36
WN Central	0.52	0.09	0.06	0.34
WS Central	0.52	0.08	0.05	0.35

**Notes:** This table shows the employment at four mutually exclusive goods-trading classifications (defined in Section 2.2.1) as a share of total employment in a region (defined in Section 2.3). “Non-Trader” are firms that neither export nor import goods in year  $t$ ; “Exporter” are firms that only export goods in year  $t$ ; “Importer” are firms that only import goods in year  $t$ ; “Exporter-Importer” are firms that both export and import goods in year  $t$ . Each row sums to 1.

**Source:** Authors’ calculations using BDS-Goods Traders division table.

**Table 9. Share of Employment in a Division, by Trader Status**

	Non-Trader	Exporter	Importer	Exporter-Importer
EN Central	0.16	0.17	0.14	0.17
ES Central	0.06	0.06	0.05	0.06
Mid-Atlantic	0.14	0.13	0.17	0.14
Mountain	0.07	0.06	0.06	0.06
New England	0.05	0.06	0.06	0.05
Pacific	0.15	0.15	0.18	0.15
South Atlantic	0.19	0.19	0.17	0.19
WN Central	0.08	0.08	0.07	0.07
WS Central	0.11	0.11	0.10	0.11

**Notes:** This table shows the employment in a region as a share of total employment in a goods-trading classification (defined in Section 2.2.1). “Non-Trader” are firms that neither export nor import goods in year  $t$ ; “Exporter” are firms that only export goods in year  $t$ ; “Importer” are firms that only import goods in year  $t$ ; “Exporter-Importer” are firms that both export and import goods in year  $t$ . Regions defined in Section 2.3. Each column sums to 1.

**Source:** Authors’ calculations using BDS-Goods Traders division table.

**Table 10. Decomposition of Total Net Job Creation Rates (average)  
by Trader Status**

	Business Cycle: Peak to Peak			All
	1992-2000	2001-2007	2008 -2019	Years
A. Non-Trader	1.44	0.57	0.33	0.71
1. Intensive	1.14	0.37	0.3	0.56
2. Extensive	0.30	0.2	0.04	0.15
B. Exporter	0.41	0.08	0.05	0.16
1. Intensive	0.20	0.02	0.03	0.07
2. Extensive	0.20	0.06	0.03	0.09
C. Importer	0.07	0.08	0.21	0.13
1. Intensive	0.03	0.03	0.13	0.08
2. Extensive	0.04	0.05	0.07	0.06
D. Exporter-Importer	0.31	-0.10	0.24	0.17
1. Intensive	0.12	-0.32	0.07	-0.02
2. Extensive	0.19	0.22	0.17	0.19
Total (A+B+C+D)	2.23	0.63	0.83	1.18
1. Intensive	1.49	0.10	0.53	0.69
2. Extensive	0.73	0.53	0.31	0.49

**Notes:** This table reports the average net job creation rates by four mutually exclusive goods-trading classifications (defined in Section 2.2.1) for four time periods as shown in the first column. “Non-Trader” are firms that neither export nor import goods in year  $t$ ; “Exporter” are firms that only export goods in year  $t$ ; “Importer” are firms that only import goods in year  $t$ ; “Exporter-Importer” are firms that both export and import goods in year  $t$ . “Intensive” measures the difference in job creation and destruction at continuing firms; “Extensive” measures the difference in job creation at new firms and destruction due to firm shutdowns. Each row sums to the total average net job creation rate in a given period.

**Source:** Authors’ calculations using BDS-Goods Traders economy-wide table.

**Table 11. Net Job Creation Rates by Trading Status**  
**Economy-wide, Size, Age Tables, 1992-2019**

	BDS Sample Aggregation by Goods Trader:			
	Economy-Wide	Size	Age	Size +age controls
Exporter	0.372 (0.243)	0.857*** (0.232)	3.693*** (0.288)	2.878** (1.163)
Importer	1.252*** (0.231)	1.584*** (0.254)	4.420*** (0.255)	3.285*** (1.099)
Exporter-Importer	-0.852*** (0.206)	-0.144 (0.231)	3.332*** (0.240)	1.347 (1.522)
Constant	1.377*** (0.119)	1.070*** (0.125)	-0.552*** (0.142)	75.509 (53.309)
Fixed Effects	Year	Year $\times$ Size	Year $\times$ Age	Year $\times$ Size
adj. $R^2$	0.859	0.793	0.994	0.803
Observations	112	335	560	335

**Notes:** \*  $p < 10\%$ ; \*\*  $p < 5\%$ ; \*\*\*  $p < 1\%$ . Robust standard errors in parentheses. This table displays coefficients from regressing net job creation rates on three mutually exclusive goods-trading classifications (defined in Section 2.2.1) weighted by average employment as described in Equation 8. “Exporter” are firms that only export goods in year  $t$ ; “Importer” are firms that only import goods in year  $t$ ; “Exporter-Importer” are firms that both export and import goods in year  $t$ . The last column includes annual employment shares for each firm age group by goods-trader type as additional controls in the size table sample.

**Source:** Authors’ calculations using BDS-Goods Traders economy-wide, size, and age tables.

**Table 12. Net Job Creation Rates by Broad Sector and Trading Status:  
Industry-Year Controls for Overall Economy and Sector**

	Emp Share	Estimated Effect for:			Obs.
		Exporter	Importer	Exp-Imp	
<b>All Industries</b>	1.00	1.06***	2.07***	0.48***	31,077
<b>Goods-Producing</b>					
Agriculture & Mining	0.01	1.77**	5.92***	-0.73	665
Construction	0.05	1.97***	3.96***	-0.23	1,119
Manufacturing	0.12	2.69***	4.40***	1.48***	9,607
<b>Services-Providing</b>					
Retail	0.13	2.46***	4.04***	3.46***	2,990
Transportation	0.04	1.03*	1.22**	0.32	2,878
Utilities	0.01	-1.70**	-1.37***	-1.87***	335
Wholesale	0.05	3.48***	4.70***	3.45***	2,126
Information	0.03	1.02	1.97**	-0.64	1,224
Finance, Ins. & Real Estate	0.07	0.18***	1.31***	-1.13**	1,889
Administrative	0.08	0.25	-0.26	-1.21*	1,224
Management	0.03	1.02	2.39***	0.37	112
Professional Services	0.06	0.17	3.12***	-1.24***	1,004
Health	0.14	0.41	0.94***	0.23	2,002
Education	0.03	0.99*	0.39	0.44	784
Accommodation & Food	0.10	-0.03	1.34***	-1.00***	662
Arts	0.02	0.77	1.93***	1.42***	1,006
Other Services	0.05	0.89**	1.71***	-0.55	1,450

**Notes:** \*  $p < 10\%$ ; \*\*  $p < 5\%$ ; \*\*\*  $p < 1\%$ . Robust standard errors. This table reports the regression coefficients on three mutually exclusive goods-trading classifications (defined in Section 2.2.1) from estimating Equation 8 on all sectors and separately by seventeen broad sectors (defined in Section 4.3). “Non-Trader” are firms that neither export nor import goods in year  $t$ ; “Exporter” are firms that only export goods in year  $t$ ; “Importer” are firms that only import goods in year  $t$ ; “Exp-Imp” are firms that both export and import goods in year  $t$ . Broad sectors defined as a single or group of 2-digit NAICS as follows: Agriculture & Mining (NAICS 11, 23); Construction (NAICS ); Manufacturing (NAICS 31-33); Retail (NAICS 44, 45); Transportation (NAICS 48, 49); Wholesale (NAICS 42); Utilities (NAICS 22); Information (NAICS ); Finance, Insurance, Real Estate (NAICS 51); Administrative (NAICS 56); Management (NAICS 55); Professional Services (NAICS 54); Education (NAICS 61); Health (NAICS 62); Accommodation & Food (NAICS 72); Arts (NAICS 71); Other Services (NAICS 81, 92). “Goods-Producing” and “Services-Providing” defined by Bureau of Labor Statistics (2021). The first column shows the average share of total U.S. employment by a broad sector. The last column shows the number of observations. All regressions include 4-digit NAICS by year fixed effects. **Source:** Authors’ calculations using BDS-Goods Traders sector table.

# A Appendix

## A.1 Linking the LBD and LFTTD

Firms identified as goods traders in the LFTTD may not be present in the LBD in a given year  $t$ .<sup>17</sup> This occurs for two main reasons. First, the LFTTD utilizes all available years of the BR beginning in 1976 to identify the firm that undertakes the merchandise shipment such that a firm identifier for a goods transactions may be obtained from a year of the BR other than  $t$ .<sup>18</sup> Second, the LBD implements retiming algorithms in intercensal years to capture establishment transitions from single-unit (SU) to multi-unit (MU) in Economic Census years (years ending in “2” or “7”). The LBD assigns the *firmid* associated with the MU firm to the SU firm; however, the BR would contain the SU firm identifier. This implies that the continuing SU will appear with a different *firmid* in the LBD than the LFTTD (Chow et al., 2021, Section 3).

We implement the following algorithm to maximize the links between firm identifiers in the LFTTD and the LBD in year  $t$  to construct the BDS-Goods Traders:

1. Match *firmid* in the LFTTD to *firmid* and *firmid\_rorg* in the LBD.<sup>19</sup>
2. Of the remaining firm identifiers in the LFTTD that did not match to the LBD identify *firmids* that begin with “0”. Single-unit firms have a 10-digit firm identifier structure as follows: “0” + EIN. Then remove the preceding “0” and match the resulting 9-digit EIN to *ein* in the LBD and retrieve the associated *firmid*.
3. Match the *firmid* from the step above to *firmid* and *firmid\_rorg* in the LBD.

Figure A1 shows the count of goods trading firms in BDS-Goods Traders between 1992-2019. We observe a sharp increase in the “importer only” and “exporter-importer” categories and sharp drop in the “exporter only” category beginning in 2007. This is driven by the availability of the ultimate consignee’s EIN (UCEIN) in addition to the EIN of the importer of record in the merchandise import transactions records in 2007. The importer of record is liable for payment of all duties and meeting the legal requirements for goods importation; the ultimate consignee is the final owner of the merchandise. The LFTTD prioritizes links made using the UCEIN and BR. Establishment counts within each goods-trading category as shown in Figure A2 reveal that firms that both export and import account for higher shares of all establishments.

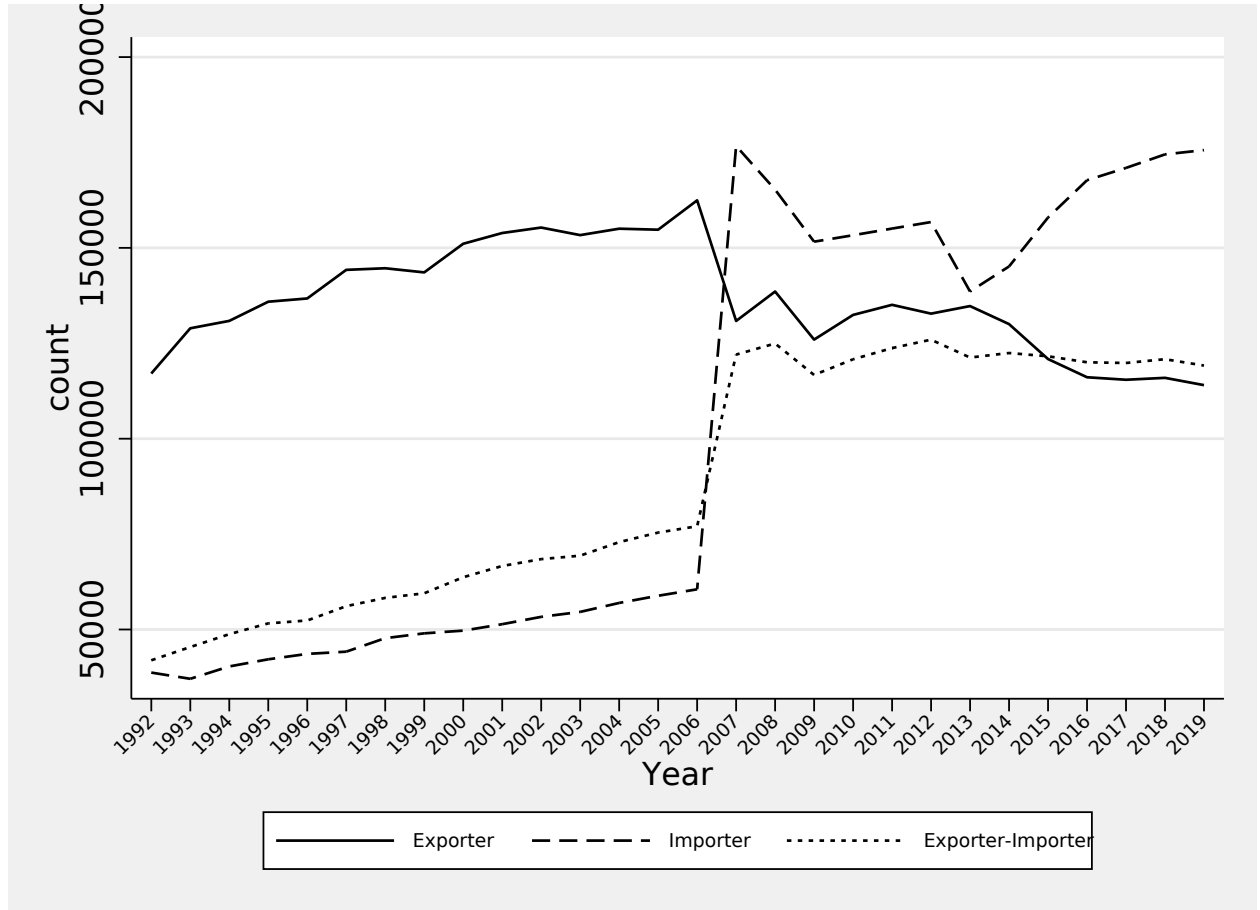
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<sup>17</sup>An implication of incomplete links between firm identifiers in the LFTTD and LBD in a year  $t$  is that simple firm counts by goods-trader classification in the LFTTD will differ from the firm counts in BDS-Goods Traders.

<sup>18</sup>Firms in the LFTTD that do not match to the LBD in year  $t$  will be found in at least one year of the LBD series beginning in 1976 through year  $t - 1$  (Kamal and Ouyang, 2020, Table 3).

<sup>19</sup>The LBD stores two sets of firm identifiers when a re-organization occurs within a year. Therefore, we match LFTTD to the LBD using both *firmid* and *firmid\_rorg*.

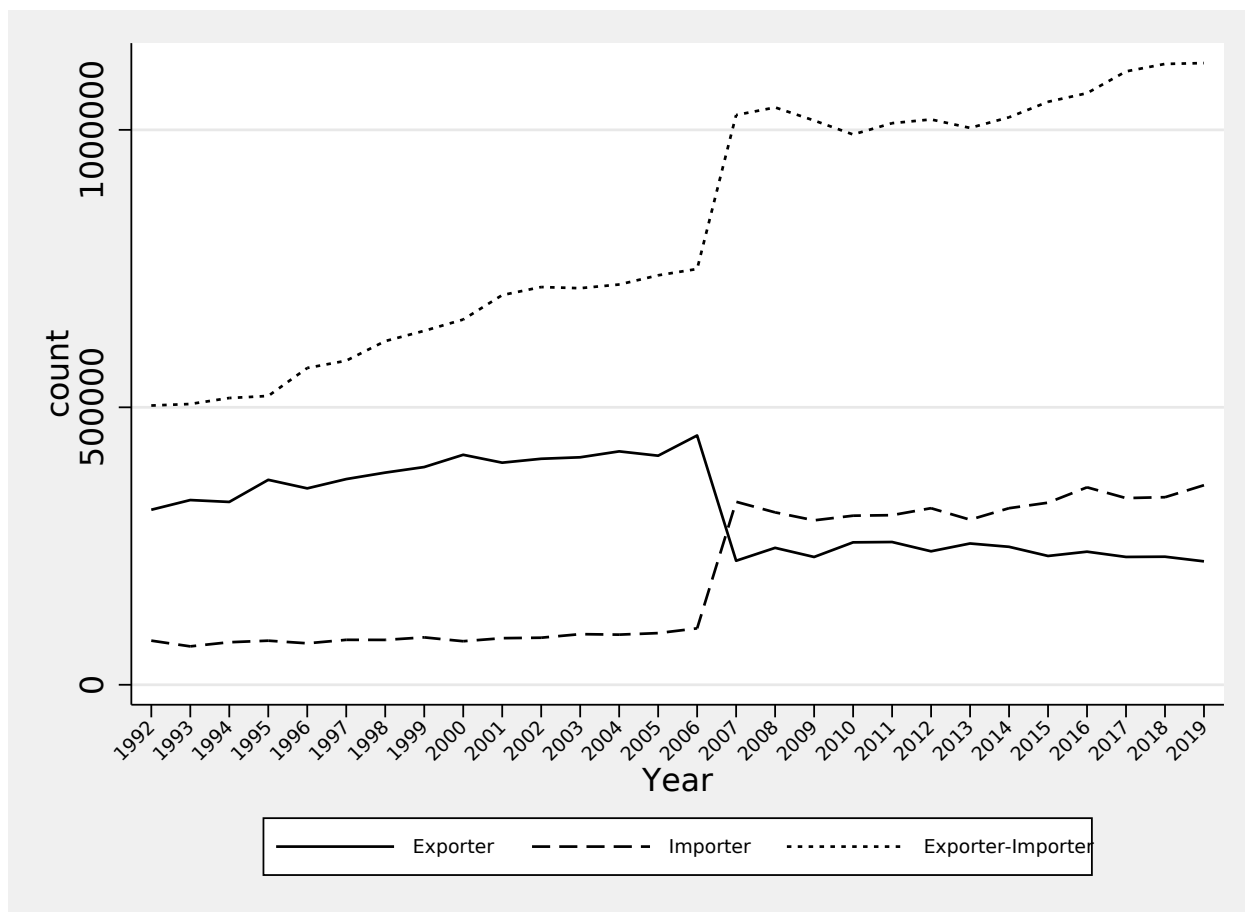
Figure A1. Goods-Trading Firms in the U.S. Economy



**Notes:** This figure plots the number of firms by four mutually exclusive goods-trading classifications (defined in Section 2.2.1). “Non-Trader” are firms that neither export nor import goods in year  $t$ ; “Exporter” are firms that only export goods in year  $t$ ; “Importer” are firms that only import goods in year  $t$ ; “Exporter-Importer” are firms that both export and import goods in year  $t$ .

**Source:** Author’s calculations using BDS-Goods Traders economy-wide table.

**Figure A2. Goods-Trading Establishments in the U.S. Economy**



**Notes:** This figure plots the number of establishments by four mutually exclusive goods-trading classifications (defined in Section 2.2.1). “Non-Trader” are firms that neither export nor import goods in year  $t$ ; “Exporter” are firms that only export goods in year  $t$ ; “Importer” are firms that only import goods in year  $t$ ; “Exporter-Importer” are firms that both export and import goods in year  $t$ .

**Source:** Author’s calculations using BDS-Goods Traders economy-wide table.

## A.2 Comparison to Census Bureau Data Products

The Census Bureau publishes the “Profile of U.S. Importing and Exporting Companies” (“Profile”) on an annual basis (U.S. Census Bureau, 2019). This report contains the value of goods trade by various characteristics of identified U.S. exporting and importing firms. Export statistics are based on the Exporter Database (EDB) and import statistics are based on the Importer Database (IDB) (U.S. Census Bureau, 2021h). The EDB and IDB differs from the LFTTD primarily due to its reliance on matching only to the current year of the BR. In addition, the EDB uses different name matching routines for Canadian export transactions that does not include machine learning; the IDB does not incorporate UCEIN in the matching algorithms.

Distinct from the “Profile”, the BDS-Goods Traders provides statistics on employment and firm dynamics by various characteristics of identified U.S. exporting and importing firms. Nonetheless, both data products report the count of known goods-trading firms in the United States.

Data users should be aware that the annual firm counts will differ between the “Profile” and BDS-Goods Traders for four main reasons. First, there are underlying differences in matching methodologies that link the merchandise transactions to the BR between the LFTTD and EDB and IDB. Second, not all identified trading firms in LFTTD may be linked to the LBD as described in Section A.1. Third, BDS-Goods Traders calculates statistics on employment and firm dynamics which requires firms to be present in both years  $t$  and  $t - 1$ . Finally, BDS-Goods Traders follows the disclosure avoidance method for BDS which uses Hybrid Balanced Multiplicative Noise Infusion (U.S. Census Bureau, 2021d). Hence, noise factors are applied to data in the LBD to construct BDS that may further introduce differences in firm counts between the “Profile” and BDS-Goods Traders.