A portrait of backshorers.

Evidence from Italian Administrative Data

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Abstract

We investigate the determinants and effects of the backshoring phenomenon. We develop a strategy to identify production backshoring events that draws on the literature on offshoring. We identify backshoring events as persistent negative changes in bilateral imports in the same industry as firm production that are not matched by any increase in offshoring to any other countries. According to our results, backshoring remains relatively rare, with only about 5% of all offshoring firms doing backshoring over 2008-2015. Backshoring firms, on average, are smaller, younger, less productive, less internationally exposed, and employ a higher proportion of part-time workers. They predominantly operate in medium to low-skill sectors. Backshoring is associated with a temporary increase in employment, mainly driven by temporary workers, that is quickly re-absorbed. After backshoring, value-added and turnover display a declining trend. Backshoring appears to drive a reshuffling in labour force composition from white-collar to blue-collar workers and from highly educated to less educated employees. These findings have significant implications for the desirability and the design of policies aimed at promoting backshoring.

Keywords: Backshoring, reshoring, offshoring, trade, import, production

1 Introduction

Supply chain disruptions have become increasingly widespread. Man-made and natural disasters, trade wars, COVID-19 and geo-political conflicts have spurred prolonged uncertainty

and affected access to critical raw materials and components (Shih, 2020; Williams and Bushey, 2021; Schwellnus et al., 2023). The need to reduce supply chain dependency on other countries and to increase supply chain resilience has become a priority in policymaking in Europe and worldwide (European Parliament, 2021; OECD, 2022; World Bank, 2023). The EU Open Strategic Autonomy emphasizes the need to "developing domestic capacities and diversifying sources of supply along the value chain [...] to significantly reduce the existing strategic dependencies and avert the risk of replacing them with new ones" (European Commission, 2022). Jo Biden called for "resilient American supply chains to revitalize and rebuild domestic manufacturing capacity, maintain America's competitive edge in research and development, and create well-paying jobs" (cited in Grossman et al., 2023). The emphasis on domestic capacity development highlights the strong political support not only to mitigate supply chain vulnerability but also to production reshoring (Javorcik, 2022; UNCTAD, 2020; Grossman et al., 2023; Baldwin and Freeman, 2022).

Broadly speaking, manufacturing reshoring refers to the relocation of production or tasks from a foreign location either back home or to another country (De Backer et al., 2016; Johansson and Olhager, 2018; Fratocchi et al., 2015). When production activities are brought back to the home country, the we refer to backshoring. Bringing production back home or reconfiguring global input sourcing mitigates the challenges associated with the geographic dispersion of fragmented value chains. Policy incentives to promote reshoring have been introduced in many developed economies, starting from the USA during the Obama administration in 2012, and continuing with Japan, South Korea and other European countries, in particular France, the UK and the Netherlands (EU Policy Department, 2021; Eurofound, 2019; White House, 2012). More recently, the Italian government announced a 50% corporate tax rebate for companies deciding to backshore production[1], complementing existing incentives introduced in the past at the subnational regional level (Elia et al., 2021; Piatanesi and Arauzo-Carod, 2019).

One could expect that such widespread support draws on broad evidence about the effectiveness of reshoring in promoting social and industrial policy objectives. Quite on the contrary, a closer look at the literature reveals that we still know very little about the potential for reshoring to contribute to performance and employment at home. We also know relatively lit-

[1] Il Sole 24 ore, "Mimit: via metà tasse a imprese che tornano in Italia" October 16th, 2023.

tle about the absolute size of the phenomenon: there are some valuable attempts launched to monitor the phenomenon based on secondary data collected through media sources, mostly involving large firms (e.g., the European Reshoring Monitor project for Europe) or surveys with limited samples (e.g., the Re4It initiative in Italy; the European Manufacturing Survey for Austria, Germany and Switzerland). While precious to identify the reasons why firms decide to reshore, these approaches do not allow to properly compare the profile of reshorers to that of other firms, to assess the size and the dynamics of the phenomenon, nor to estimate its impact on firm performance and labour market outcomes.

Leveraging a unique administrative-based firm-level database, this study aims to offer a comprehensive portrait of backshoring firms and first robust evidence on the economic consequences of backshoring for firms and their labour composition. In this paper we restrict our focus to production backshoring, i.e., the relocation process leading a firm to bring part or the whole of its production back to its own in-house plants. In so doing, we follow the well-established literature on offshoring at the firm level (see Hummels et al., 2014 for an application and Hummels et al., 2018 for an overview of the issue), and start from the interpretation of backshoring as the reverse of "narrow" offshoring, i.e., is a negative change in the imports in the same HS4 product category as firm production. Yet, a simple reversal of the standard offshoring measure is likely to fall short of properly capturing backshoring. First, a sheer decline in offshoring may capture other phenomena that are unrelated to backshoring, such as a reduction in firm activities. Second, the restructuring involved in backshoring requires the decline in offshoring to be persistent over time. Furthermore, a decline in offshoring between two countries that is associated with a subsequent increase in offshoring towards another country would not match the backshoring of production to the origin country — although it may under some conditions measure the related phenomenon of nearshoring. Hence, we include some additional conditions to be associated with the mere decline in offshoring: (a) an increase in employment in the original (home) plant must occur; (b) the negative change in offshoring must be persistent over time; (c) it is not matched by any increase in offshoring of the same firm to any other country; (d) it is associated with an increase in employment in the home plant.

Our empirical analysis relies on a unique dataset linking COEWEB-ISTAT population data about Italian firms trade over the period 2005-2020, the VisitINPS social security data about the

population of Italian firms, as well as CERVED and Aida Bureau Van Dijk data about firms' production sectors and balance sheets. We find that about one third of all manufacturing firms which trade also do offshoring and among those about 5% did backshoring during the observation period. Backshoring firms are on average smaller, younger, less productive, less internationally exposed, have a higher percentage of part-time workers and a low share of top managers, and operate in medium-low sectors. After backshoring, employment displays a sizeable but temporary increase, while value added, turnover and turnover per employee display a declining trend over time. In the longer run, backshoring appears to drive a labour force recomposition, away from white collars towards blue collars, and from highly educated to less educated, which operates in the short term through an increase in the employment of temporary workers. These findings, novel in literature, hold crucial implications for policy makers in the design and implementation of backshoring policies as well as for managers in the forecast of the consequences of backshoring.

To our knowledge, this is the first attempt to measure backshoring on the entire population of a country using administrative data and to provide evidence on its effect on firms and labour force. Furthermore, our approach to measure backshoring is in principle scalable and replicable in different countries and periods, and it allows monitoring the time dynamics of backshoring, as well as estimating its impacts. While we focus on production backshoring, our operationalization may be easily extended to other forms of relocation such as supply-chain backshoring and nearshoring[2].

The structure of this paper is as follows: in Section 2, we offer an overview of the determinants and effects of backshoring drawing from the existing literature. In Section 3, we provide a brief description of our data sources. In Section 4, we present the criteria proposed to advance the measurement of production backshoring. Moving to Section 5, we apply our measurement to the data and discuss some summary statistics. Section 6 delves into the characteristics of firms engaged in backshoring based on our criteria, and Section 7 estimates the impact of backshoring

[2]Several related concepts are used in the literature and policy documents, emphasizing different dimensions of the phenomenon. The first one is where tasks are relocated. As mentioned, "reshoring" is used as a generic term, while "backshoring" applies when tasks are relocated back into the home country of the firm. "Nearshoring" refers to relocating activities closer to the home country. "Friendshoring" refers to relocating activities to countries that are considered as reliable for geopolitical reasons. Moreover, depending on the entity that was performing the tasks abroad, we can distinguish between "captive" reshoring if the tasks were performed in a subsidiary, and "supply chain reshoring" if it was performed by an external supplier (De Backer et al., 2016; Johansson and Olhager, 2018; Fratocchi et al., 2015).

on firm performance and labour composition. Finally, Section 8 concludes with a summary of the study and a discussion of its policy implications.

2 Backshoring in the literature

2.1 Determinants and outcomes of backshoring

Over the past decades, there has been a notable trend toward the international disaggregation of production processes and global sourcing. Three key developments have enabled this phenomenon: the advancement in information and communication technology, allowing firms to more easily monitor production processes placed in distant locations; a significant reduction in trade costs, due to lower transportation expenses and faster shipping methods, coupled with decreased trade tariff- and non tariff-barriers; and the removal of political and economic barriers, exemplified by events like the fall of the Berlin Wall, China's access to the WTO, and the adoption of market economy practices in East and Southeast Asia. These factors collectively contribute to the increased presence of labour-intensive economies in the globalization process (Antràs, 2020; Fort, 2017; Contractor et al., 2010; Hummels, 2007). Previous studies have extensively discussed that global sourcing and offshoring involve high fixed costs to enter foreign markets, including transaction costs, some of which are sunk in nature, along with the presence of uncertainty when operating in different markets. This explains the sticky nature of global value chain configurations (Dixit, 1989; Arte and Larimo, 2019; Antràs, 2020), and the fact that the most productive firms are more likely to be able to bear the costs of going abroad, and to further benefit from this international exposure (Miroudot et al., 2009).

Since 2008, the slowing down in the growth path of globalization, i.e., "Slowbalization", has become apparent (World Bank, 2019; Antràs, 2020). Several factors are eroding the advantages of offshore production. Among those, the key features include marked rise in factor costs in developing and emerging economies, supply chain disruptions due to health and political emergencies, global financial crises and changes in trade policy stance with a stall in multilateral and bilateral liberalization and an upsurge in protectionist activities. This might push companies to reassess their global value chain structures, production and sourcing locations,

drawing increased attention to reshoring, defined as the decision to relocate (partially or totally) activities back into the home country (backshoring) or to a country near home (nearshoring).

Furthermore, the restructuring of the production process can be facilitated through the adoption of industrial automation and robotics, diminishing the appeal of low-cost countries for international production (Laplume et al., 2016; Dachs et al., 2019; Faber, 2020; Krenz et al., 2021; Baldwin and Freeman, 2022). At the same time, while product quality concerns and the willingness to show commitment towards the home country, related to the made-in effect, play an important role in marketing strategies and may contribute to the decision to re-shore (Grappi et al., 2015; Fratocchi et al., 2016; Ancarani et al., 2019), other studies argue that the decision can be influenced by technology-related factors, like the loss of know-how in the home country and the geographical proximity between production and R&D activities to boost innovation and product development (Pisano and Shih, 2012; Stentoft et al., 2015). In turn, the balance between increasing costs and decreasing benefits from offshoring becomes more compelling as the economic conjuncture worsens. Accordingly, some contributions have highlighted that reshoring is more frequently observed during recessions or other macroeconomic events, including conflicts and the probability of supply shocks (Delis et al., 2019; di Stefano et al., 2022). Another factor to consider is the local business environment, which encompasses traditional location factors that render specific locations attractive, such as tax incentives, education, talent availability, and systems for intellectual property protection. Additionally, the lack of local suppliers at home may deter reshoring decisions (Porter and Rivkin, 2012; Nujen et al., 2019; Canello, 2022).

Moreover, there is growing awareness of the hidden costs of globalization, especially about the management difficulties of a transnational business and error correction of previous managerial mistakes. Some of the disadvantages manifest subtly and become apparent only over time and can negatively impact firm performance (Porter and Rivkin, 2012; Larsen et al., 2013; Barbieri et al., 2018). The impact of offshoring costs can vary among different firms. These costs are notably more significant for small and medium enterprises (SMEs) due to their limited experience in coordination and communication procedures, and in managing the complexity of operating internationally (Canello, 2022; Larsen et al., 2013). Small firms face challenges due to inadequate methods and capabilities to evaluate the offshoring decision, and difficulties in implementing monitoring procedures. This increases their vulnerability to opportunistic be-

havior from foreign suppliers, resulting in higher coordination costs and extended delivery times. This may suggest that smaller firms repatriate manufacturing activities earlier compared to large companies (Ancarani et al., 2015; Barbieri et al., 2018). Benstead et al. (2017) find evidence that the number of SMEs reshoring has increased over time. This might also be explained by an unwillingness or inability to financially support further difficulties faced in offshoring-related activities (Kinkel, 2012; Benstead et al., 2017). However, while small firms tend to mimic the behaviour of their peers when going abroad, this mimic behaviour does not emerge when peers reshore (Canello, 2022). However, it is not just about the size of the firm, and productivity levels are an important element in the decision to internationalise and source from abroad, and so in the decision to revert existing international configurations. The most productive firms are better equipped to operate in foreign countries, therefore further changes can be incentivised only from shocks perceived as permanent (di Stefano et al., 2022).

The above discussion highlights that larger and more productive firms are expected to be more capable of bearing the costs of operating and sourcing internationally, and they can further benefit from this global configuration. Among the firms engaging in global sourcing, larger and more productive firms are more likely to stay abroad as they have learnt how to manage and coordinate geographically dispersed activities and complex organisational structures, evaluate costs and generate value from it. Furthermore, considering the sunk nature of specific fixed costs to establish their international operations, it is more likely that companies will stick with their current structural configurations. Additionally, when firms are less committed to foreign markets, reversing their offshoring strategies can be relatively easier. Hence, unless external conditions undergo significant changes, reshoring may represent a survival strategy to correct poorly performing offshoring activities, raising questions about the actual impact of such a decision on the performance of the company and the broader economy.

While the determinants of reshoring have attracted substantial interest in literature, the evidence on its outcomes is rather limited. From a firm-level perspective, Brandon-Jones et al. (2017) investigate the effect of the reshoring announcement on shareholder wealth made by companies domiciliated in the U.S. from 2006 and 2015, and find positive abnormal (short-term) stock returns. However, investors can under (or over) react to firm-specific news, therefore long-term returns should also be analysed. Two other studies focus on domestic employment growth

and the effect on local supply chains at the sub-national regional level. De Backer et al. (2016) find that for US multinational firms there is no evidence of a positive impact on home-country employment, despite an evidence of a higher concentration of capital investment within the country. Canello (2022) find a positive effect on the productivity growth of local subcontractors after reshoring in the region, but no significant effect on the birth or survival of suppliers. He also finds indications that some firms opt to retain their relationships with domestic suppliers relationships when expanding abroad as part of their strategy. This can facilitate relocation decisions, considering that the search for new suppliers can entail significant costs, and represent a possible mechanism explaining the effect on productivity.

Two recent papers study reshoring as the mechanism of the labour market adjustment to robot adoption. Faber (2020) finds that robot adoption in the US reduces the need for foreign sourcing from Mexican maquiladoras over 1990-2015 and has sizeable effect on Mexican local labour employment, notably for men and low educated machine operators. Krenz et al. (2021) use data for 9 manufacturing industries for a sample of mostly EU countries in the 2000-15 period and finds a significant positive effect of robot adoption on reshoring and on the wages of high-skilled workers only.

2.2 Existing evidence on backshoring: the size of the phenomenon

Backshoring is a clear, although multifaceted, concept. Yet, there is no official definition nor official statistics available on it. This lack has led scholars to propose ad hoc measures, either at the industry or at the firm-level, to quantify the size of the phenomenon. Some studies adopt industry level measures. Faber (2020) measures reshoring as the change in the export value per worker and the change in export-producing plants per worker, using data from Mexican local labour markets. Krenz et al. (2021) measure reshoring as the ratio between domestic inputs and foreign inputs, using the World Input-Output Tables.

As for firm-level measures, most of the studies have employed secondary data of reshoring events or ad hoc surveys for specific countries or sectors, providing only a partial picture of the phenomenon and a methodology that is not necessarily replicable across countries. On the one hand, data on reshoring events rely on data collected from secondary sources (media, news-

papers and companies' websites). An example is the European Reshoring Monitor database, collected by Eurofound – The European Foundation for the Improvement of Living and Working Conditions, which reports 250 cases among European countries over the period 2015-2018. A similar collection method is used by Fratocchi et al. (2016) for Europe and Brandon-Jones et al. (2017) in the USA. However, this type of data suffers from both a large-firm and a positive bias, as it is more likely that news tracks large relocation decisions which have, at least in the short run, a large impact on employment and investments.

On the other hand, many survey-based studies on reshoring have been limited to single countries with relatively small sample sizes. For instance, Stentoft et al. (2015) surveyed Danish firms, obtaining a 23% response rate (843 out of 3,572 firms), and 10.3% report reshoring. Johansson and Olhager (2018) focused on Swedish manufacturing firms with over 50 employees, discovering 133 cases of offshoring and 99 cases of backshoring from 2010 to 2015. di Stefano et al. (2022) use Italian multinational enterprise data from a survey (Spring 2021) of the Bank of Italy, showing that only 2.6% had reshored production. Surveying 762 Italian firms in 2021-2022, Confidustria Servizi and Re4It find that 16% of them were involved in offshoring, 16.5% of which backshored. Canello (2022) and Canello et al. (2022) utilized a dataset from the Italian Ministry of Economy and Finance Annual Survey for the clothing and footwear industries, showing that, on average, 7% engaged in offshoring, and 21% of offshoring firms (264) engaged in backshoring between 2006 and 2012. Dachs et al. (2019) used the European Manufacturing Survey 2015, covering 1,705 manufacturing firms from Austria, Germany, and Switzerland, finding a 4.2% share of backshoring firms in the sample.

While some studies claim representativeness of the sample (e.g. di Stefano et al. (2022)), they often cover short periods, have small sample sizes, and their approach proves challenging to be replicated in other countries.

Delis et al. (2019) propose an alternative methodology using parent-subsidiary information retrieved from Bureau van Dijk's Orbis dataset. They identify a reshoring episode when a negative change in employment in the foreign subsidiaries of a manufacturing firm, matched by an increase in employment (of any size) in the parent company, occurs. Analyzing more than 3,500 MNEs from 14 developed countries in the 20062013 period, they found that 13% of firms engaged in reshoring at least once and from at least one subsidiary. However, this method cap-

tures only captive offshoring, overlooking the importance of "outsourcing offshoring" which involves offshoring through contracts with foreign third-party suppliers.

Overall, the available evidence highlights that reshoring firms represent a small but not negligible fraction of offshoring firms (between 20 and 10%). However, these figures are obtained using small samples distorted towards large firm size so that a more comprehensive approach is necessary to have a proper picture of the phenomenon as well as to portrait reshoring firms and estimating the economic effects of relocating production activities home. Large administrative dataset, potentially covering the whole population of firms in a country, would be extremely valuable in this respect once a firm level measure of backshoring, based on available information and not on survey answer, is devised. This approach would have the additional advantage of being easily replicable across countries. To the best of our knowledge, such an approach does not exist yet and developing it is the aim of the present paper.

3 Data

The data sources we employ to implement our administrative-based measure of backshoring are similar to the ones employed in recent studies on the labour market effects of offshoring and automation, e.g., Hummels et al. (2014); Carluccio et al. (2019); Olney and Pozzoli (2021); Domini et al. (2022).

Our analysis is based on the combination of three main data sources. The first measure backshoring from detailed international trade data flows for Italian firms, the COEWEB-ISTAT database, that include administrative population-level data on all the import-export activities of Italian firms in value and quantity. Such dataset reports highly disaggregated details on the product classification at the 8-digit Combined Nomenclature level, the corresponding 5-digit ATECO 2007 industry classification[3], the partner country and the transport mean at the transaction level. To implement our administrative-based measure of backshoring, we match such detailed information on trade with the main industry of activity of the firm from balance sheet records by AIDA-Bureau Van Dijk, in order to identify the main product category of firm pro-

[3] ATECO is the Italian classification of economic activities, the first four digits of which are identical to the NACE Rev2 classification

duction, essential for our measure of backshoring. We have access to these trade data over the 2008-2019 period. The second data source, retrieved by the Italian Social Security Institute (INPS), provides administrative matched employer-employee information on the whole population of employees in Italy, on yearly basis. It combines three different pieces of information. The first one is worker level and contains personal information on each worker (e.g., gender, age). The second one is job-level and contains complete information on worker's job records over the period 2005-2020 (e.g. wages, working days, job contract type, main task and education). The third one is firm-level and provides information on firms like industry activity, location, establishment date. The last data source, CERVED, is provided by the CERVED Group and collects balance-sheet information, on yearly bases, for the main economic and financial indicators such as revenues, production costs, fixed tangible assets and profits for the population of incorporated companies operating in the private sector (excluding agriculture and finance).[4]

The COEWEB, INPS and CERVED datasets are then matched by using the firms fiscal number as a firm identifier. The resulting dataset, which we call COEWEB-INPS-CERVED, covers the whole population of private-sector incorporated firms in Italy observed from 2008 to 2019. For each firm and year, we can identify all of its employees, their job contracts, economic variables, whether the firm participates in international trade or if the firm offshore or backshore activities.

Despite their very high quality and comprehensiveness, our data bear relevant limitations. The first limitation concerns the absence of detailed product-level data about firm production. This makes it difficult to exactly match the good produced with the one imported, a crucial issue to measure offshoring and reshoring. A second limitation concerns the lack of data on domestic purchases, which prevents us from identifying domestic outsourcing and supply chain backshoring. A third limitation concerns the matching phase within the Visitinps program. In particular, the need to aggregate trade data for privacy reasons in the process of matching COEWEB with VisitINPS data implies aggregating firm-level imports and exports into classes

[4] As we discuss below, practical considerations force us to employ two different databases on balance sheet data, i.e., CERVED and AIDA, as they are, respectively, accessible within the VisitINPS servers and outside the institution. Given that privacy reasons prevent us from importing the transaction-level datased in INPS, we have to compute the measure of de-shoring outside the institute and import it as firm-level data. Reassuringly, CERVED and AIDA contain the same information: as declared by AIDA, the information gathered by Bureau Van Dijk on the balance sheets of Italian firms is drawn from CERVED.

of turnover share, dropping some unique observations, and giving up all information about exports and country of origin. Moreover, to ensure firms' anonymity, we have to drop observations relating to firms that are "unique" in our dataset, in the sense that they have trade data that are not matched by at least 3 other firms in the dataset. We loose at most 66 backshorers in this process. This practical limitation also constrains our ability to compare different operationalizations of reshoring in the matched employer-employee dataset.

This type of data is accessible in a number of countries, e.g., Denmark, France, Italy, Sweden, and Turkey, and makes our measure in principle replicable and scalable in a number of contexts.

4 Measuring backshoring

A well-established firm-level measure of offshoring does exist. This is import-based, draws on administrative data on trade, and is grounded in the wake of the prominent contributions pioneered by Feenstra and Hanson (1999) as well as their subsequent applications (see, e.g., Feenstra and Hanson (2003) and Harrison et al. (2011) for comprehensive reviews). Feenstra and Hanson (1999) measure offshoring as the imports of intermediate goods. Using US data, they identify two possible measures of offshoring at the industry level, one broad and one narrow, where the broad measure includes all intermediate goods for the industry, and the narrow measure includes only the inputs in the same two-digit SIC industry as the good has been produced. Using Danish data, Hummels et al. (2014) apply this approach to a matched employer-employee database linked with firm-level imports. Broad firm-level offshoring is the sum of all inputs imported by the firm; narrow offshoring is the sum of the inputs in the same broad product or industry category where the firm operates (e.g., in the same 4-digit HS category of the firm in the case of Danish firms). The intuition is that the closer the imported inputs are to the final outputs, the more likely it is that these products could have been produced within the company at home without resorting to offshoring.

We follow this granular approach to develop a novel firm-level measure of backshoring. In so doing, we recognize that any kind of reshoring is based on some degree of reduction in narrow offshoring. Additional criteria may apply depending on whether we consider production backshoring, supply chain backshoring nearshoring, or other types of relocation.

In this paper, we focus on production backshoring, i.e. the restructuring process leading a firm to bring all or part of its production back to its own plants. Thus, we focus on a relatively narrow definition of backshoring, which excludes supply chain backshoring, as well as any reshoring that remains abroad.

For illustration, this implies that our measure of production backshoring will capture the case of an Italian firm that closes down a subsidiary in China and brings its production back to its own plants in Italy, but not the case of a firm that reshores its foreign production away from China onto Poland (an example of nearshoring), nor of a firm that closes its Chinese subsidiary and starts purchasing from an Italian manufacturer. Our measure may be viewed as restrictive, but it allows for a precise identification of our phenomenon of interest.

We call backshoring a firm strategy where all of the following criteria apply:

1. A negative change in offshoring to a particular partner country occurs
2. The negative change is persistent over time
3. The negative change is not matched by any increase in offshoring of the same firm to any other country
4. The negative change is associated with an increase in employment in the original (home) plant.

In the next paragraphs, we consider each criterion separately.

4.1 A negative change in bilateral offshoring

The natural starting point to identify reshoring is to reverse the measure of offshoring established in the firm-level literature (Hummels et al., 2018, 2014), i.e. the imports in the same HS4 product category as firm production. As discussed by Hummels et al. (2014), input purchases are highly specific to individual firms, and high-productivity firms are systematically different from other firms. Hence, industry-level analyses may neglect important sources of variation that are instead captured by firm-level analysis. Originally, Hummels et al. (2014) looked at the imports in the same HS4 category as goods produced by the firm (either sold domestically or in exports). Lacking product-level data on domestic sales, we follow Olney and Pozzoli (2021) and Carluccio et al. (2019) and rely on the firm main industry of activity. Hence, we attribute

the entire firm production to the 5-digit ATECO 2007 industry activity of the firm, as reported in the balance sheet dataset. Our ISTAT-COEWEB firm-level trade data allow precisely tracking firms' imports at the HS8 level, which has a many-to-one correspondence with 5-digit ATECO 2007 sectoral categories, hence allowing for an accurate attribution of offshoring decisions to firms. We use the ATECO to classify firm production and import/export transactions.

Looking closer at this first criterion, we can see that not any decline in bilateral offshoring is compatible with backshoring. Specifically, a negative change in import values may be due to changes in factor prices that lead to better purchasing conditions for the importing firm and may have nothing to do with backshoring. By contrast, a negative change in import quantities is more credibly and conservatively reflecting a decline in offshoring to a particular country.

Furthermore, a negative change in imports may reflect a variation in the firm's performance. In other words, if the firm is facing financial difficulties, it may reduce its imports just because it is reducing its purchases of any kind of inputs. To mitigate the impact of variation in firm economic performance on our measure, we normalize imports in quantity with respect to turnover.

Moreover, we want to avoid identifying backshoring events with minor variations of inputs (similarly to Delis et al., 2019, who impose thresholds in the change in employment in the subsidiary). We impose that (i) the initial decrease in offshoring exceeds 20% of the initial offshoring, and (ii) the amount of offshoring 4 years later reduces by at least 50%. The first of the two thresholds turns out to be relatively binding, driving a difference in $\pm$ 200 cases being classified as backshoring. The second is, instead, not very binding, leading to a difference in $\pm$ 20 cases being classified as backshoring.

4.2 A persistent negative change

Fluctuations or temporary variations in offshoring may incorrectly inflate our measure of backshoring. Hence, we only call backshoring the cases in which the negative variation is persistent, i.e., after the first negative variation, we observe only negative or null variations in offshoring.[5]

This condition raises a censoring issue that is not present in the established measure of off-

[5]Unfortunately, for the typical firm-country couple, we do not observe a long enough time period to estimate bilateral import trends (see Section 3), and to allow observed bilateral imports to fluctuate around a generally declining trend. This fact forces us to be, again, a bit restrictive in our definition, and to only consider as negative changes the strictly negative variations in bilateral imports.

shoring: clearly, the condition is more restrictive for negative variations that occurred earlier. We address this issue by imposing a fixed time window of 4 years. Hence, we call backshoring only the negative changes in bilateral offshoring that are not reversed by any increases in the subsequent 4 years. This implies that the latest possible episode of backshoring occurs 4 years before the last year in our trade sample, and we lose potential reshoring occurred in the post-2015 period.

4.3 A bilateral decline in offshoring that is not matched by any increase in multilateral offshoring

If a firm's offshoring decreases bilaterally, but increases towards other partner countries, we may infer that the firm is searching for alternative sourcing strategies, but not that it is doing backshoring. Hence, our third criterion to identify backshoring is that the decline in bilateral offshoring is not matched by any increases in offshoring to any other country. Specifically, we define backshoring as the first year in which both the bilateral and multilateral conditions apply.

For illustration, suppose that an Italian firm's offshoring to China decreases in 2010, and that this decline is persistent over the next four years. If, in 2012, the firm's offshoring to, say, Vietnam, increases, we would not say that the firm is doing backshoring in 2010. Suppose further that, since 2013, the firm's offshoring starts to persistently decline towards Vietnam and all other partner countries. In this case, we would argue that the firm started a backshoring strategy in 2013 — even if the first observed decline in bilateral offshoring was observed in 2010.

Importantly for our estimation strategy, this way of defining backshoring makes it a firm-level event that can be viewed as an absorbing state (Sun and Abraham, 2021), at least for the next four years.

4.4 Firms that de-shore increase employment in the home plant

The above three criteria plausibly identify firms that "de-shore", i.e., firms that divest from other countries, but not necessarily firms that bring production back home. The timing of the restructuring abroad and at home is not obvious, and we don't observe product-level produc-

tion. Hence, it may be that firms undergoing financial difficulties first reduce their imports from abroad and then reduce production as a whole. Hence, it is still possible that offshoring shrinks due to financial difficulties, and not because the firm is backshoring.

For clarity, we label "de-shorers" the firms that satisfy conditions 1–3 without further specifications — i.e., firms that experience a persistent decline in bilateral offshoring that is not matched by any increase in multilateral offshoring. The advantage of this measure may be that it can accommodate supply chain backshoring to other Italian firms, but it may also capture broader cases of firms' financial difficulties.

We label "backshorers" the firms that satisfy conditions 1–3 and, in addition to that, increase their employment by any amounts in the year of de-shoring or the year before (similarly to Delis et al., 2019). Indeed, we expect that a firm that decides to bring production back home in year t will hire at least one person in year t or $t-1$. We consider increases in employment given that employment decisions are more likely to reflect firms' restructuring strategies than, e.g., increases in turnover or sales, which are subject to more complex demand dynamics.

This implies that, in principle, we may call backshoring the rather peculiar case of a firm that satisfies conditions 1-3, increases employment by a single person, but does not increase sales. The reason behind this is that it may take some time before the restructuring becomes fully operational and translates into increased sales.

5 Descriptives

We follow Hummels et al. (2014) and focus on manufacturing firms to avoid confounding offshoring with reselling. Over 2008-2015, 83,233 Italian manufacturing firms engaged in some trade. In 2015, 12% only imported, 35% only exported, 53% did both. A look at the trade data reveals rather concentrated trade patterns. A 27% of firms import one single product, and 60% less than 5 products; similarly, a 28% of firms export one single product, and 70% less than 5 products. Such a small number of products imported suggest that imports and exports are highly firm-specific, supporting the appropriateness of firm-level analysis (Hummels et al., 2014)

Given our focus on production backshoring and our interest in the imports of final and

Table 1: Summary Statistics: Firm characteristics

	Backshoring firms		Offshoring firms		All firms	
	Mean	SD	Mean	SD	Mean	SD
Turnover	4,346	23,333	12,634	153,437	6,654	103,336
Labor cost	546	895	1,570	10,172	892	10,054
Value added	882	1,925	2,441	13,819	1,383	32,589
Employees (FTA)	18.14	24.19	41.48	237.7	11.87	120.21
Ln(employees)	2.34	1.12	2.67	1.36	1.28	1.32
Firm age	11.11	11.67	12.69	12.76	9.02	11.49
Female share	0.34	0.28	0.35	0.27	0.35	0.37
Foreign workers share	0.13	0.18	0.12	0.16	0.22	0.35
Part-time share	0.13	0.18	0.12	0.19	0.30	0.39
Fulltime share	0.87	0.18	0.88	0.16	0.70	0.39
Temporary workers share	0.18	0.25	0.16	0.22	0.17	0.30
Blue collars share	0.61	0.28	0.58	0.27	0.73	0.34
White collars share	0.29	0.25	0.32	0.25	0.15	0.26
Middle managers share	0.008	0.048	0.013	0.054	0.004	0.038
Top managers share	0.005	0.024	0.008	0.037	0.003	0.036
Medium-hightech	0.23	0.42	0.27	0.44	0.09	0.29
Medium-lowtech	0.28	0.45	0.26	0.44	0.33	0.47
Firms	1,144		21,773		494,106	

intermediate products rather than raw materials, we consider narrow offshoring. Following Carluccio et al. (2019), we identify the industry of firm production with the 5-digit ATECO-2007 sectoral classification of the firm and call "narrow offshoring" the imports in the same 4-digit ATECO industry category as firm production. The comparison with Hummels et al.'s original application is not immediate due to the absence of a conversion between higher-level aggregations of HS products with ATECO, but given the correspondence between HS8 and 5-digit ATECO reported in our trade data, we may argue that, employing a 4-digit ATECO instead of a 4-digit HS classification, we end up with a possibly narrower definition of reshoring.

Over our sample period, 27,493 firms did some offshoring over the considered period: about 33% of all trading manufacturing firms, with stable shares over the 2008-2015 period. 26,503 offshoring firms have valid turnover data.

We then match the COEWEB trade data with the VisitINPS social security data to create our trade-employer-employee dataset. The anonymization and matching of firms in the trade and social security databases is performed internally by INPS.

Over the 2008-2015 period, the matched VisitINPS-trade database contains a total of 493,926 manufacturing firms. A vast majority of them, about 91%, do not trade over the observed

period. 44,311 manufacturing firms engage in some import, while 21,771 firms, about 4% of all manufacturing firms, offshore some share of their production. A 11% of all offshoring firms, amounting to 2,431 firms, turn out to satisfy conditions 1–3, i.e., are classified as "de-shorers" according to our criteria. They make up a tiny share of all manufacturing firms, i.e., a 0.5%. The firms satisfying criteria 1–4, i.e., the ones classified as "backshorers" according to our criteria, are 1,144 over our sample period. They make up a 5% of all offshoring firms, and an even smaller share of all manufacturing firms, equal to 0.2%.

The weight of backshorers on offshorers is even lower when we consider workers. Out of the 37,350,657 worker-years employed in manufacturing firms, about 6,8 million worked in firms that engaged in some offshoring over our sample period, implying that about 18% of all manufacturing workers have been exposed to offshoring. Of these, only about 2.4%, i.e., 167 thousands, were also exposed to some backshoring, while about 309 thousand workers were employed in firms doing some de-shoring. Comparing these numbers with those of firms suggests that, on average, firms doing backshoring are larger than the average manufacturing firm, but smaller than the average offshoring firm. The summary statistics in Tables 1 and 2 confirm these facts.

The summary statistics outline a clear profile of backshorers. Relative to offshorers, they are smaller, younger, and more production-oriented. They have a lower share of managers, and are more likely to fall in the low-tech category. Relative to the average manufacturing firm, they are larger, older, and less-production oriented and more likely to fall in the high-tech category. Overall, they appear to fall in between the average manufacturing firm and the average offshoring firm.

6 Determinants of backshoring

To get a better understanding of the drivers of backshoring, we run a set of logit models studying the firm characteristics that make it more likely that an offshoring firm decides to backshore:

$$Pr(y_{it}) = Pr(\alpha + X_{it-1}\beta + \tau_t\gamma + \omega_r\delta + \theta_s\eta > \varepsilon_{it})$$

Table 2: Summary Statistics: Worker characteristics

	Backshorers		Offshorers		All firms	
	Mean	SD	Mean	SD	Mean	SD
total wage	21,723	14,819	27,683	21,456	22,915	21,750
total days paid	254.94	91.72	267.05	82.03	244.15	98.65
weeks paid	42.49	15.29	44.51	13.67	40.69	16.44
daily wage	79.21	63.35	101.51	409.63	86.06	234.99
ln(daily wage)	3.96	1.33	4.29	1.13	3.90	1.50
age	40.18	10.25	41.33	9.78	40.32	10.25
experience	19.98	11.63	21.30	11.08	19.76	11.63
temporary	0.14	0.34	0.09	0.27	0.13	0.32
part time	0.10	0.29	0.06	0.23	0.13	0.33
top manager	0.01	0.08	0.02	0.12	0.01	0.11
middle manager	0.01	0.10	0.04	0.19	0.03	0.16
white collar	0.26	0.44	0.31	0.46	0.27	0.44
blue collar	0.67	0.47	0.60	0.49	0.64	0.48
female	0.31	0.46	0.29	0.45	0.31	0.46
foreign-born	0.14	0.34	0.09	0.29	0.14	0.35
Workers	167,238		6,763,464		37,350,657	

Where $y = \{\text{backshoring event}\}$. y_{it} is a binary dependent var =1 if the firm backshores in year t, = 0 if it does not. We set the variable to missing in the years after the backshoring event. X_{it-1} is a vector of firm characteristics evaluated at the year before backshoring. $\tau_t, \omega_r,$ and θ_s are year, province and 4-digit industry dummies. ε_{it} is the idyosyncratic error term.

We report our estimates of the characteristics of backshorers in Table 3, studying the characteristics that make it more likely that an offshoring firm becomes a backshorer.

The results confirm that, relative to other offshoring firms, backshoring firms have fewer employees, lower turnover per employee, and are disproportionately concentrated in the classes of imports/turnover and offshoring/turnover that are below 25%. These results are confirmed when including turnover growth (column 2). net purchases growth (column 3), to adding growth in fixed assets (column 4), as well as province and industry dummies (columns 5-6).

Interestingly, instead, we do not find strong evidence that backshoring occurs as a consequence of significant capital investments (e.g., Dachs et al., 2019): backshoring firms are less capital intensive than other offshoring firms, and the effect of growth in fixed assets is insignificant.

On the whole, backshoring appears to be a feature of smaller, less productive, less internationally exposed firms,which makes them presumably less able to cope with the challenges of value chain risk relative to other offshoring firms. Differently from what has been argued in survey-based studies, our results do not support the interpretation that reshoring occurs as a

result of capital investments.

7 Effects of backshoring

The above analysis yielded a profile of backshorers that, while plausible, is quite radically different from the profile that policymakers seem to have in mind.

We now turn to a different, although related, issue: the effect of backshoring on firm performance and labour composition.

7.1 Empirical application

By construction, the backshoring event is an absorbing state that could occur in any years between 2009 and 2015. Hence, to estimate the effects of backshoring on firm outcomes, we rely on a staggered diff-in-diff approach (Goodman-Bacon, 2021). In setting the time variable for the staggered diff-in-diff, we recognize that the firm-level strategic decision to reshore presumably anticipates actual backshoring and may display its effects even before the firm actually backshores. For instance, a firm which intends to backshore in year $t+1$ may start hiring new workers in year t to be prepared. For this reason, we allow for one year anticipation in the effects of backshoring— in Callaway and Sant'Anna (2021) notation, we allow for an anticipation horizon $\delta = 1$.

Our identification assumption is that, absent backshoring, firms that ever backshore would have evolved along similar trajectories as other offshoring firms that never backshore, until one year before backshoring. A major estimation issue that we face is that, as discussed in Section 6, reshoring choices are clearly not random. Hence, in what follows, we apply the Callaway and Sant'Anna (2021) approach, which relies on a common trend assumption that holds conditional on covariates, and allows for limited anticipation of the treatment effects.

Moreover, the Callaway and Sant'Anna (2021) approach addresses the well-known issue that, even in the absence of pre-trends, the variation in backshoring timing would make standard two-way fixed effects estimators inappropriate. In presence of treatment effects heterogeneity over time or across cohorts, two-way fixed effects mix never-treated with already-treated units in the control group, and may give negative weights to some of the underlying

Table 3: Estimation results: Characteristics of backshorers

	(1)	(2)	(3)	(4)	(5)	(6)
log(Employment)	-0.003***	-0.003***	-0.003***	-0.003***	-0.003***	-0.003**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
log(Turnover/employee)	-0.002***	-0.002***	-0.002***	-0.002***	-0.003***	-0.002***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
roe	-0.000	-0.000	-0.000	-0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
capital/turnover	-0.0001**	-0.0001*	-0.0001*	-0.0001*	-0.0001**	-0.0001**
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
firm age	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
blue collar share	0.004	0.006	0.006	0.006	0.006	0.005
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
white collar share	-0.001	0.001	0.001	0.001	0.002	0.001
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
middle manager share	-0.001	0.002	0.000	0.001	0.001	0.000
	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)
share less-experienced workers	0.005	0.004	0.004	0.004	0.003	-0.002
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
share primary educated	0.003	0.002	0.002	0.002	0.002	0.003
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
share secondary educated	0.002	0.001	0.001	0.002	0.002	0.002
	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)	(0.003)
share tertiary educated	0.008	0.008	0.006	0.007	0.006	0.005
	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.007)
average age	0.000	-0.000	-0.000	-0.000	-0.000	-0.0003*
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.0002)
share offshoring $< 25\%$	0.002**	0.002**	0.002**	0.002**	0.002**	0.002**
	(0.001)	(0.001)	(0.001)	(0.001)	(0.00102)	(0.001)
share import $< 25\%$	0.004***	0.004***	0.004**	0.004**	0.003**	0.003***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
turnover growth		-0.000004*	-0.000003	-0.000004*	-0.000003	-0.000005
		(0.000002)	(0-000002)	(0.000002)	(0.000004)	(0.000005)
net purchases growth			0.00005	0.00006	0.00006	0.00006
			(0.00008)	(0.00008)	(0.00008)	(0.00008)
capital growth				-0.000007	-0.000005	-0.000006
				(0.000009)	(0.000009)	(0.000009)
N	70,674	69,046	68,991	68,878	68,878	68,878
ll	71,823.0	70,001.9	70,045.1	70,129.5	70,271.0	70,365.0
aic	-143,581.9	-139,937.8	-140,022.1	-140,189.1	-140,478.0	-140,666.0
bic	-143,288.6	-139,636.1	-139,711	139,869.2	-140,185.0	-140,373.5
Firm-level controls	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Province FE	No	No	No	No	Yes	Yes
Sector FE	No	No	No	No	No	Yes

Standard errors in parentheses. $^{*}p < 0.1,^{**}p < 0.05,^{***}p < 0.01$

units and time-specific average treatment effects (Goodman-Bacon, 2021; Sun and Abraham, 2021). As a result, the size and sign of the estimated average treatment effect may be biased, and the estimated coefficients can be contaminated by effects from other periods, invalidating standard pre-trends tests (Sun and Abraham, 2021).

The Callaway and Sant'Anna (2021) approach yields semi-parametric estimates of the so-called group-time average treatment effects, corresponding to the time-specific average treatment effects calculated for a particular cohort:[6]

$$ATT_X(g,t) = E[Y_t(g) - Y_t(0)|X, G_g = 1], \text{ for } t \geq g - \delta$$

$$ATT_X(g,t) = E[Y_t - Y_{g-\delta-1}|X, G_g = 1] - E[Y_t - Y_{g-\delta-1}|X, C = 1].$$

Using Callaway and Sant'Anna (2021) notation, $Y_t(g)$ is the firm-level outcome of interest observed at time t (e.g., employment, value added, turnover per employee...), g periods after being first treated. $Y_t(0)$ is the corresponding outcome for the non-treated firm. G_g is a cohort dummy equal to one if the firm is first treated at time g, and zero otherwise, X is a vector of covariates, δ is the anticipation horizon, C is a dummy identifying never-treated firms. We also experiment with not-yet treated firms as the control group.

Combining the group-time average treatment effects by year or by cohort with the appropriate weights we can obtain the average treatment effects on the treated observed $t - g - \delta$ years from the decision to backshore, resembling a standard event study analysis, test for the presence of pre-trends, and combine all average treatment effects post-treatment, providing the insights that are usually pursued by standard diff-in-diff ATT estimates.

To explore the validity of our conditional common trend assumption for a sufficiently long time period, we exploit the longer availability of labour market data relative to trade data, and consider a time window of 3 years before the decision to backshore. This implies that we are studying firm and labour market outcomes over a time period that is earlier than the first year for which we observe trade data. In other words, we are assuming zero backshoring before 2009 — or equivalently, no decisions to backshore before 2008. The risk that firms which back-

[6] We implement this approach in Stata with the user-written command `csdid` (Rios-Avila et al., 2023).

shored before 2009 end up in the control group should nonetheless be minor: as discussed in, e.g., Antràs (2020), de-globalization tendencies were negligible before the 2008 global financial crisis.[7]

7.2 Results

Before delving into the analysis of the effects of backshoring on firms' performance and composition, we study the impact of backshoring on variables that we expect to validate our measure. By bringing production back home, vertical integration should increase, and the share of labour costs over turnover should increase. In Table 4, we confirm these expectations and find that backshoring increases labour costs over turnover, decreases the share of net purchases over total costs (a measure of vertical disintegration) and increases value added over turnover (a measure of vertical integration). On the whole, these checks support the interpretation that our backshoring measure is internally valid. The pre-trend tests also support the conditional absence of pre-trends.

Table 4: Validation of the backshoring measure

	(1)	(2)	(3)
Dep. var:	**ln(Lab. costs/Turnover)**	**ln(Value Added/Turnover)**	**ln(Net purchases/Total costs)**
After backshoring	0.071***	0.033***	-0.059***
	(0.015)	(0.012)	(0.012)
Pretrend test p-value	0.298	0.138	0.591
N	166,653	163,888	166,562

Dependent variables in logs. Average treatment effects estimated with the regression-adjusted method by Callaway and Sant'Anna (2021). *p<0.1; **p<0.05; ***p<0.01. Standard error clustered at the firm level in parenthesis. All controls at base year 2005. Controls included: log full-time equivalent employment, log turnover per employee, roe, distress dummy, leverage, capital by turnover, firm age, female share, migrant share, part-time share, temporary share, blue collar share, white collar share, middle managers share, other workers share, share workers with less than 15 years of experience, share workers with less than 15 years of experience, 4-digit industry and province dummies. Controls: Never treated offshoring firms.

[7] Furthermore, our criteria to identify backshorers should generally minimize that the risk of misattributing backshoring years. One exception in this respect may be the first treatment cohort, i.e., the firms having backshored in 2009. To see this point, consider a hypothetical firm having its first (unobserved) negative variation in backshoring in 2007. In case it continued decreasing its offshoring over the following years, it would be mis-assigned to the 2009 cohort of backshorers. If the negative variation occurred over 2007-2008 and then stabilized, the reshoring of this firm would not be recorded and the firm would fall in the control group. For this reason, in a robustness check, we exclude the 2009 cohort of backshorers, which eliminates the possible misallocation of the first type of firms, and mitigates the impact of the possible misallocation of the second type of firms to a couple of years maximum due to the censoring issue discussed in Section 4.2. Notice that a firm that is classified as a 2010 backshorer is a firm whose offshoring did not decrease in between 2008 and 2009, which makes the measure reasonably free from major sources of attribution error from 2010 onwards.

In table 5, we turn to the analysis of the effects of backshoring on the performance of the firm. On the whole, the average treatment effect estimated over the entire 2005-2019 period is insignificant. Looking closer at the dynamics of these effects, however, some relevant non-linearities emerge. Figure 2(a) reports the estimated effects of backshoring on employment over time. The start of the backshoring strategy is associated with a positive and relatively sizeable increase in employment (up to +11.6%) in the first years, but gets quickly reversed and within 3 years it goes back to levels that are only slightly above the pre-reshoring ones. The effects on wages are insignificant over the entire period (column 2 and Figure 2(b)), consistent with the rigid nature of the Italian labour market.

By contrast, the estimated effects on value added and turnover per employee are unambiguously negative and display a marked reversal in the year of backshoring (columns 3-6 and Figures 2(c)-2(f)). The effects on turnover and value added also display a marked reversal after an initial increase. The pre-trend tests do not reject the null hypothesis of parallel trends, except for value added, whose pre-trend test is significant at the 10%. Overall, the pattern of the estimated treatment effect clearly identifies the time of reshoring as a turning point for firm performance, which can be broadly considered to be detrimental to firm performance.

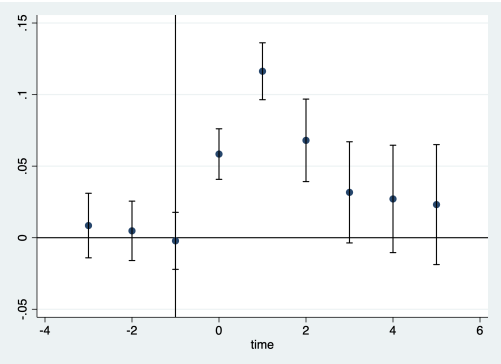
Table 5: Effects of backshoring on firm performance

Dep. var:	(1) **Employment**[a]	(2) **Average firm wage**	(3) **Value Added**[a]	(4) **Value Added/Employee**[a]	(5) **Turnover/Employee**[a]	(6) **Turnover**[a]
After backshoring	0.020	-0.005	-.032*	-0.070***	-.108***	-0.070***
	(0.016)	(0.017)	(0.019)	(0.017)	(0.017)	(0.019)
Pretrend test p-value	0.461	0.205	0.081	0.583	0.418	0.104
N	187,559	187,559	163,763	163,763	166,694	166,694

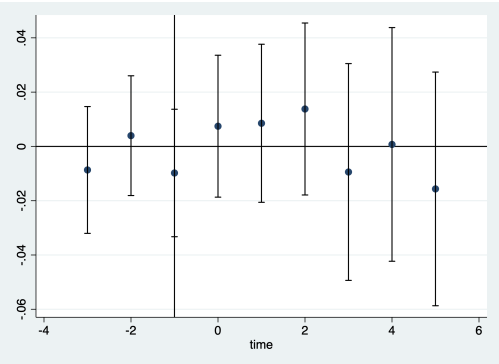
[a]Dependent variable in natural logs. Average treatment effects estimated with the regression-adjusted method by Callaway and Sant'Anna (2021). *p<0.1; **p<0.05; ***p<0.01. Standard error clustered at the firm level in parenthesis. All controls at base year 2005. Controls included: log full-time equivalent employment, log turnover per employee, roe, distress dummy, leverage, capital by turnover, firm age, female share, migrant share, part-time share, temporary share, blue collar share, white collar share, middle managers share, other workers share, share workers with less than 15 years of experience, 4-digit industry and province dummies. Controls: Never treated offshoring firms.

Table 6 reports the impact of backshoring on different types of capital investment. Consistent with the above findings, we do not identify any significant effects of backshoring on the log of fixed assets, on capital remuneration (i.e., the log of capital depreciation plus financial charges), nor on expenditures on intangible assets (columns 1-3 and Fig. 2(g) and 2(h)). As a share of employment, capital expenditures decline. Again, our findings do not support the interpretation that associates backshoring with increased investment in automation.

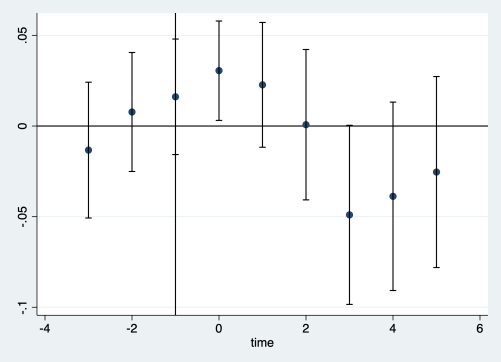
Figure 1: Backshoring effects on firm performance



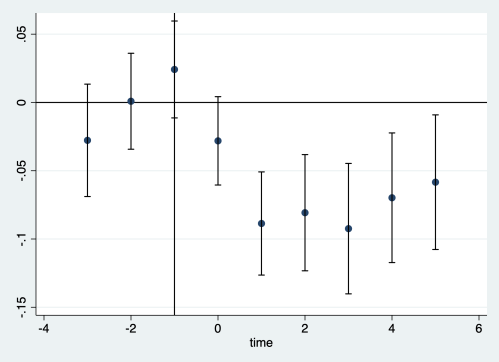
(a) (log) Employment



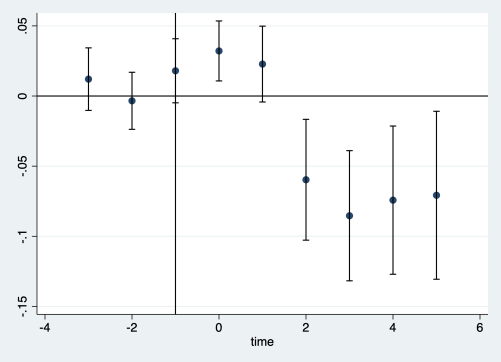
(b) (log) Average firm wage



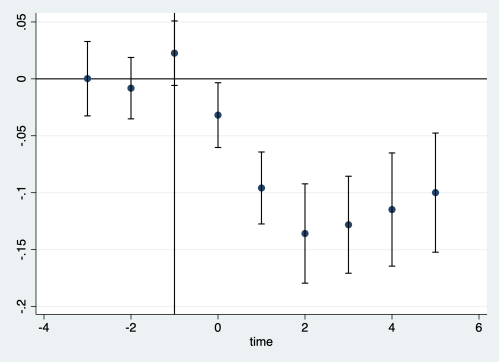
(c) (log) Value added



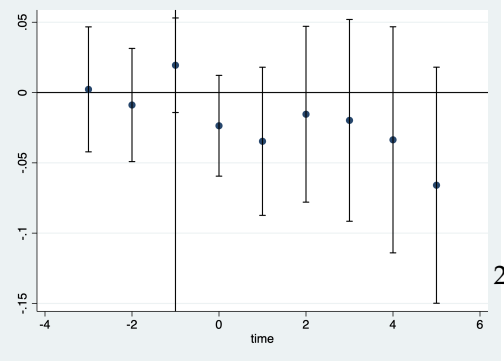
(d) (log) Value added/employee



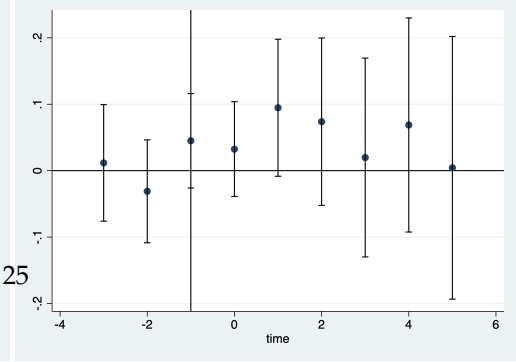
(e) (log) Turnover



(f) (log) Turnover/employee



(g) (log) Fixed assets



(h) (log) Intangible assets

Table 6: Effects of backshoring on capital investment

Dep. var:	Fixed assets[a]	K remun.[a]	K remun. /employee[a]	Intangibles[a]
After backshoring	-0.061*	-0.034	-0.071***	0.041
	(0.031)	(0.024)	(0.025)	(0.059)
Pretrend test p-value	0.416	0.433	0.442	0.646
N	166,174	166,621	166,621	140,644

[a]Dep var in logs. Average treatment effects estimated with the regression-adjusted method by Callaway and Sant'Anna (2021). Dependent variables expressed as shares. *p<0.1; **p<0.05; ***p<0.01. Standard error clustered at the firm level in parenthesis. All controls at base year 2005. Controls included: log full-time equivalent employment, log turnover per employee, roe, distress dummy, leverage, capital by turnover, firm age, female share, migrant share, part-time share, temporary share, blue collar share, white collar share, middle managers share, other workers share, share workers with less than 15 years of experience, share tertiary educated in the firm, average workers' age in the firm, 4-digit industry and province dummies. Number of observations from the corresponding two-way FE OLS estimate. Controls: Never treated offshoring firms.

To dig deeper into the understanding of the impact of backshoring, we now turn to investigating the impact of backshoring on firms' composition (Table 7). Although the average treatment effects are not very precisely estimated, inspection of the dynamic effects clearly shows that backshoring drives a reshuffling in firm composition away from white collars towards blue collars (Fig. 3(a)), which operates in the short term through an increase in the employment of temporary, less experienced workers (Figures 3(b)) and 3(c)). Coherently with the overall short-run employment effects identified, we find no evidence that the initial increase in temporary contracts increases the probability to get an open-ended contract later on (Fig. 3(d)).

Leveraging the availability of detailed information on the ISCO occupation and ISCED education at employment for the subset of workers who changed employment during the observation period, we can also further detail that the increase in the share of blue collar workers is driven by the increased demand for low-skilled workers as opposed to high-skilled workers (Table 8 and Fig 3(e)), and machine operators as opposed to clerks (Fig. 3(f)).

Overall, our findings suggest that backshoring is a rather costly strategy for firms. Hence, one may question why the firm decides to engage in backshoring. A plausible answer may be that backshoring is the only possible way for smaller and less productive firms to survive the

Table 7: Effects of backshoring on workers' contracts

Dep. var:	Blue collar	White collar	Young workers	Temporary	Turned open-ended
After backshoring	0.007	-0.006	0.009	0.009*	-0.001
	(0.004)	(0.004)	(0.006)	(0.005)	0.006
Pretrend test p-value	0.385	0.947	0.292	0.273	0.936
N	187,559	187,559	187,424	187,559	187,559

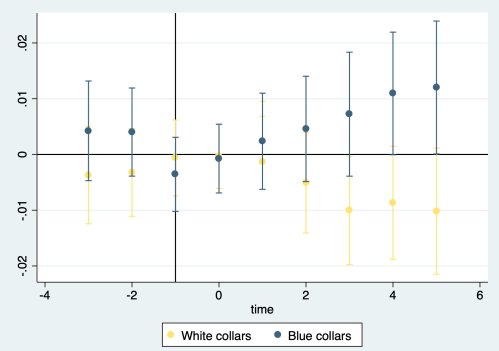
Dependent variables in shares. Average treatment effects estimated with the regression-adjusted method by Callaway and Sant'Anna (2021). *p<0.1; **p<0.05; ***p<0.01. Standard error clustered at the firm level in parenthesis. All controls at base year 2005. Controls included: log full-time equivalent employment, log turnover per employee, roe, distress dummy, leverage, capital by turnover, firm age, female share, migrant share, part-time share, temporary share, blue collar share, white collar share, middle managers share, other workers share, share workers with less than 15 years of experience, share tertiary educated in the firm, average workers' age in the firm, 4-digit industry and province dummies. Number of observations from the corresponding two-way FE OLS estimate. Controls: Never treated offshoring firms.

Table 8: Effects of backshoring on workers' composition

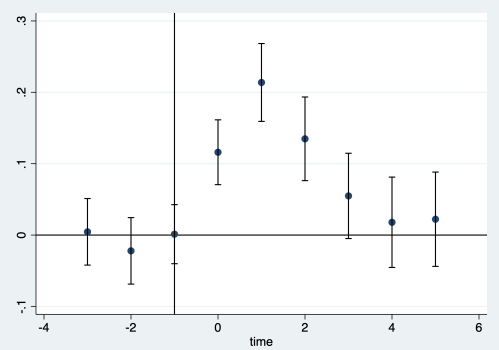
	Education level		
Dep. var:	Primary	Secondary	Tertiary
After backshoring	0.010*	-0.001	-0.004*
	(0.006)	(0.005)	(0.002)
Pretrend test p-value	0.363	0.068	0.027
N	187,424	187,424	187,424

Dep var in logs. Average treatment effects estimated with the regression-adjusted method by Callaway and Sant'Anna (2021). Column numbers correspond to the relevant ISCO occupational category, except for 6, which also contains ISCO category 9. Dependent variables expressed as shares. *p<0.1; **p<0.05; ***p<0.01. Standard error clustered at the firm level in parenthesis. All controls at base year 2005. Controls included: log full-time equivalent employment, log turnover per employee, roe, distress dummy, leverage, capital by turnover, firm age, female share, migrant share, part-time share, temporary share, blue collar share, white collar share, middle managers share, other workers share, share workers with less than 15 years of experience, share tertiary educated in the firm, average workers' age in the firm, 4-digit industry and province dummies. Number of observations from the corresponding two-way FE OLS estimate. Controls: Never treated offshoring firms.

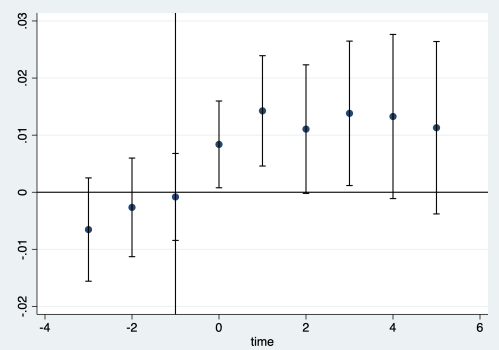
Figure 2: Backshoring effects on firm composition



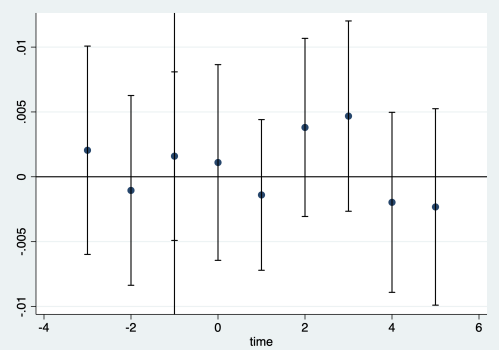
(a) White and blue collar shares



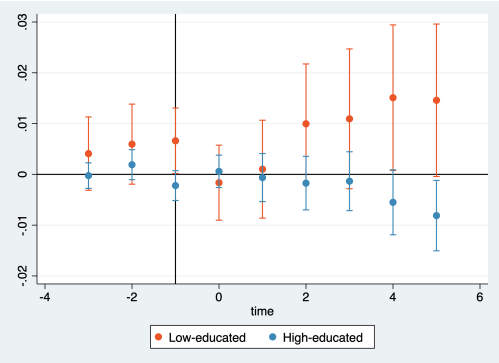
(b) Share temporary workers



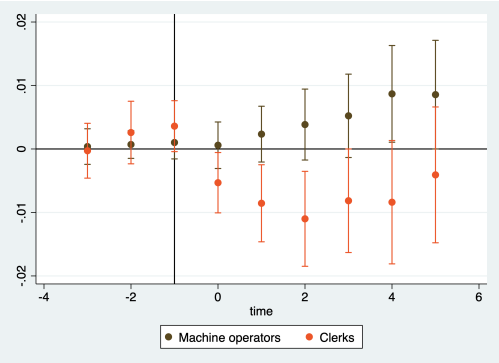
(c) Share low-experienced



(d) Share workers becoming openended



(e) Share high- and low-educated



(f) Share machine operators and clerks

increase in the implicit and explicit costs of international business. To test this interpretation, we explore the effects of reshoring on firm survival.

A sheer look at the summary statistics suggests that reshoring and survival have some interaction. Among the 1,144 firms in our sample, 71.50% survive until the end of 2021, while the share of surviving firms among the control group is only 35.39%. To estimate the impact of backshoring on firm survival, we face a standard challenge in survival studies. Clearly, relative to other offshoring firms, firms doing backshoring have a systematically higher probability to survive until at least the time of reshoring. To address this issue, we modify the Callaway-Sant'Anna routine to impose that, in each average group-time treatment effect estimate, firms in the control group have survived until at least the year before treated firms do backshoring. In a way, we force exact matching on the pre-treatment survival when estimating our diff-in-diff. The estimated average treatment effect that we identify is positive and significant, and suggests that reshoring increases the surviving probability of treated firms by 7% over the entire period (estimated ATT 0.070, s.e. 0.010, p-value < 0.001).

8 Conclusions

In this paper, we have endeavoured to extend the standard firm-level offshoring measure developed by Hummels et al. (2014) to give a measure of backshoring that is based on administrative data. With a view to identify the issues and challenges emerging from this kind of analysis, we took a rather restrictive approach and focused on production backshoring. Our operationalization highlighted the risk of confounding the effects of backshoring with those of a general deterioration of firm performance. We address this risk by considering the case of firms that increase employment in the year of reshoring or the year before. The resulting backshoring measure appears internally valid, and the highly concentrated and firm-specific patterns of trade that we identify support a firm-level perspective in the analysis of backshoring. Our analysis confirms that, until 2015, backshoring was still a limited phenomenon in Italy, with no obvious geographic pattern, that concerned smaller, less productive, less internationally exposed firms.

Our findings do not support the widespread interpretation of reshoring as a strategy that occurs after substantial investments in automation, but rather that it increases the share of manual

workers in the firm, with no significant effects on wages.

Overall, perhaps surprisingly, our findings seem to point to a fairly simple fact: Italian firms that backshore are bringing back the lower-value added phases of production they previously offshored, increasing the share of blue-collar workers and machine operators without substantial increases in capital investment. In this sense, backshoring appears to be the reversal of an offshoring decision that turned out to be too costly, which is associated with very temporary and limited employment effects, rather than a real opportunity for the economy. Although backshoring may initially appear as a survival strategy for underperforming offshoring firms, a closer analysis of the post-decision period suggests that backshoring is more of a palliative care for that type of firms.

The outcomes of our study carry important implications for policy formulation. Policies aimed at providing generic tax incentives to attract businesses may not be sufficient to ensure that reshoring generates a positive effect on the broad economy. Effective policy interventions to enhance the attractiveness of the home country for businesses, therefore for reshoring, involve a multifaceted approach. Prioritizing the improvement of location factors and the local business environment is crucial. Governments should consider initiatives such as investing in infrastructure and education to cultivate a skilled workforce. Drawing inspiration from examples of other countries, such as policies implemented during the Obama and Trump administrations in the United States, policymakers could introduce specific tax incentives and explore strategies to reduce production costs, particularly the cost of energy, and to target companies operating in certain sectors as part of the industrial policies of the country. Equally important is the recognition and investment in addressing weaknesses within the economic system to create a supportive and stable business environment that attracts and retains businesses, fostering economic growth and sustainability. This could initiate a virtuous cycle wherein even productive companies may consider the opportunity of relocating some production activities back to their home country, and generate positive effects on the whole economy. As companies reassess the advantages of domestic production, the potential for increased job creation, enhanced economic resilience, and a more robust local supply chain, becomes evident, therefore the potential for stimulating further economic growth.

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A portrait of backshorers. Evidence from Italian Administrative Data
Online Appendix

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A Robustness

A.1 Including only firms that ever backshore in the control group

Table A.1: Robustness: Including only firms that ever backshore in the control group

Dep. var:	**ln(Lab. costs/Turnover)**	**ln(Value Added/Turnover)**	**ln(Net purchases/Total costs)**
After backshoring	0.071***	0.033***	-0.059***
	(0.015)	(0.012)	(.012)
Pretrend test p-value	0.286	0.143	0.584

Dep. var:	**Employment**[a]	**Average wage in the firm**[a]	**Value Added**[a]	**Value Added/Employee**[a]	**Turnover**[a]	**Turnover/Employee**[a]
After backshoring	0.020*	-0.005	-0.032*	-0.070***	-0.070***	-0.108***
	(0.016)	(0.017)	(0.018)	(0.017)	(0.019)	(0.017)
Pretrend test p-value	0.432	0.203	0.0771	0.596	0.097	0.425

Dep. var:	**Fixed assets**[a]	**K remun.**[a]	**K remun/employee**[a]	**Intangibles**[a]
After backshoring	-0.061*	- 0.034	-0.071**	-0.040
	(0.031)	(0.024)	(0.025)	(0.059)
Pretrend test p-value	0.432	0.653	0.403	0.602

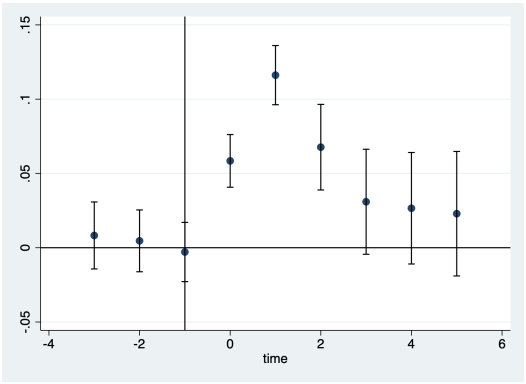
Dep. var:	**Blue collar**	**White collar**	**Low-experienced workers**	**Temporary**	**Turned open-ended**
After backshoring	0.007	0.006	0.009	0.009*	0.001
	(.004)	(0.004)	(0.006)	(0.005)	(0.003)
Pretrend test p-value	0.375	0.952	0.495	0.289	0.925

Dep. var:	Primary	Secondary	Tertiary
After backshoring	.010*	-0.001	-0.004*
	(.006)	(0.005)	(0.002)
Pretrend test p-value	0.358	0.063	0.042

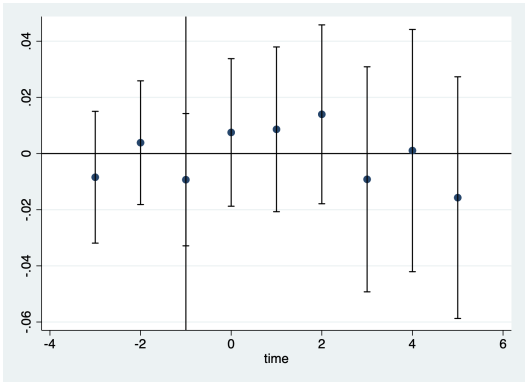
	ISCO level of occupation							
Dep. var:	1	2	3	4	5	6	7	8
	Managers	Professionals	Technicians	Clerks	Service&Sales	Agriculture	Craft	Machine operators
After backshoring	0.000	0.000	-0.001	-0.005	-0.001	0.003	0.004	0.005
	(0.000)	(0.001)	(.003)	(.004)	(0.001)	(0.004)	(0.003)	(0.003)
Pretrend test p-value	0.010	0.103	0.427	0.517	0.022	0.293	.080	0.703

[a]Dependent variables in logs. Average treatment effects estimated with the regression-adjusted method by Callaway and Sant'Anna (2021). *p<0.1; **p<0.05; ***p<0.01. Standard error clustered at the firm level in parenthesis. All controls at base year 2005. Controls included: log full-time equivalent employment, log turnover per employee, roe, distress dummy, leverage, capital by turnover, firm age, female share, migrant share, part-time share, temporary share, blue collar share, white collar share, middle managers share, other workers share, share workers with less than 15 years of experience, share workers with less than 15 years of experience, 4-digit industry and province dummies. Controls: Never treated + Not yet treated offshoring firms.

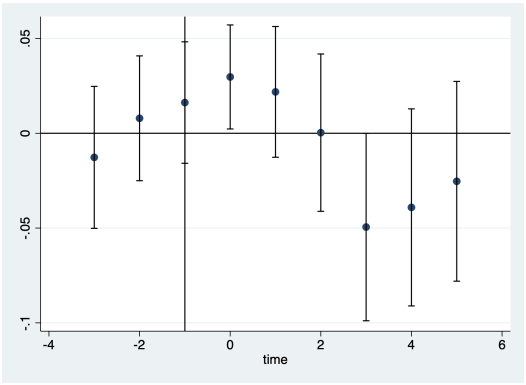
Figure A.1: Backshoring effects on firm performance. Control group: Not yet treated



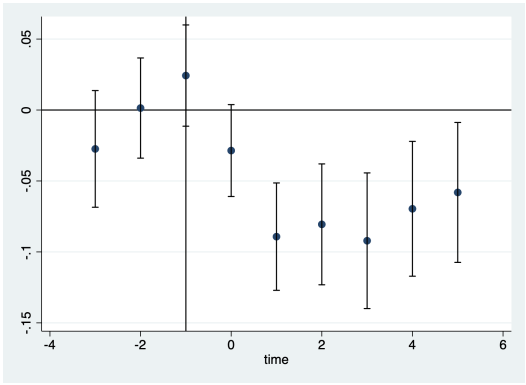
(a) (log) Employment



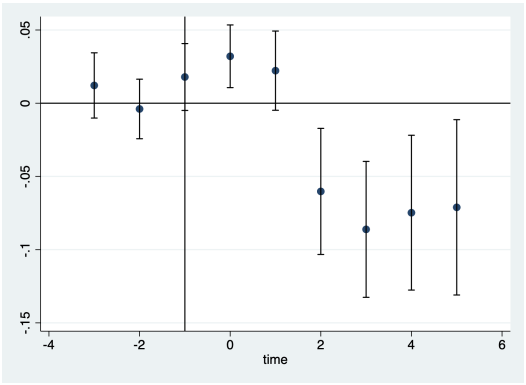
(b) (log) Average firm wage



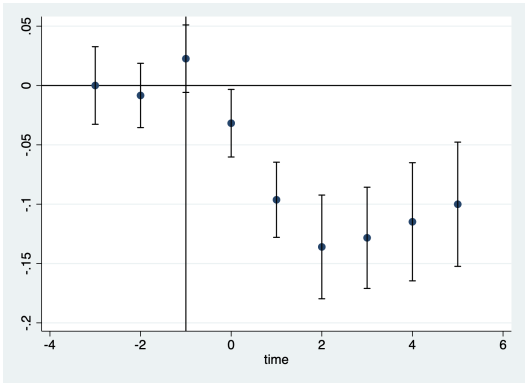
(c) (log) Value added



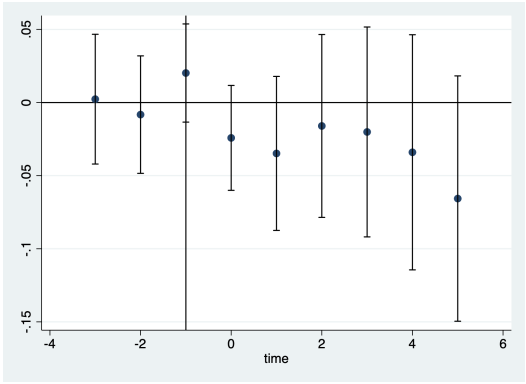
(d) (log) Value added/employee



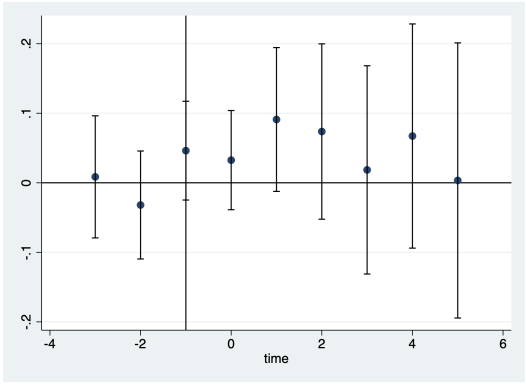
(e) (log) Turnover



(f) (log) Turnover/employee

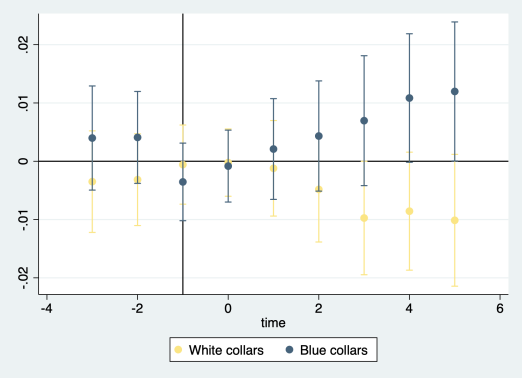


(g) (log) Fixed assets

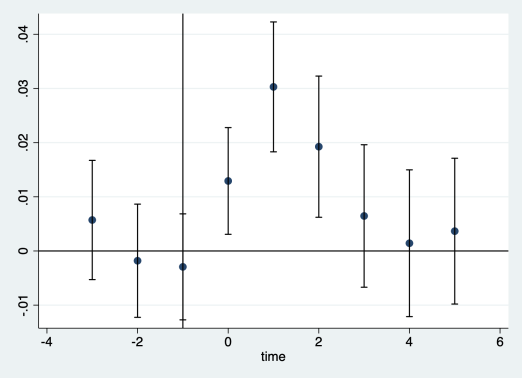


(h) (log) Intangible assets

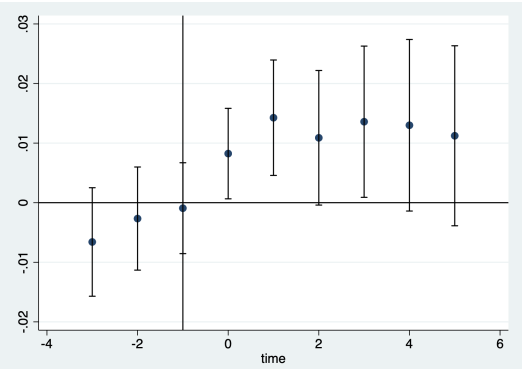
Figure A.2: Backshoring effects on firm composition. Control group: Not yet treated



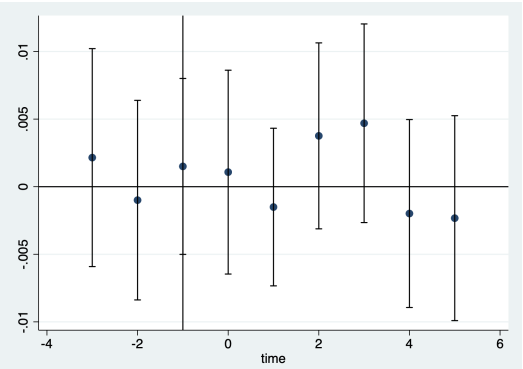
(a) White and blue collar shares



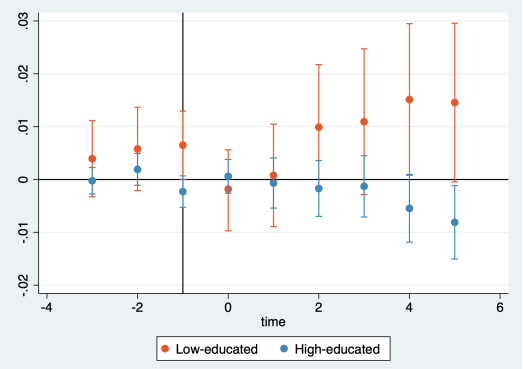
(b) Share temporary workers



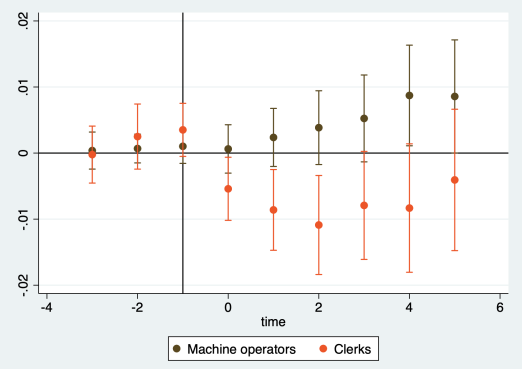
(c) Share low-experienced



(d) Share workers becoming openended



(e) Share high- and low-educated



(f) Share machine operators and clerks

A.2 Excluding the first cohort of reshorers

Table A.2: Robustness: First cohort of reshorers excluded

Dep. var:	**ln(Lab. costs/Turnover)**	**ln(Value Added/Turnover)**	**ln(Net purchases/Total costs)**
After backshoring	0.057***	0.032***	-0.047***
	(0.015)	(0.012)	(.012)
Pretrend test p-value	0.253	0.114	0.632

Dep. var:	**Employment**[a]	**Average wage in the firm**[a]	**Value Added**[a]	**Value Added/Employee**[a]	**Turnover**[a]	**Turnover/Employee**[a]
After backshoring	0.050***	0.000	0.001	-.055***	-0.032*	-0.093***
	(0.016)	(0.016)	(0.019)	(0.017)	(0.018)	(0.017)
Pretrend test p-value	0.411	0.267	0.064	0.546	0.085	0.374

Dep. var:	**Fixed assets**[a]	**K remun.**[a]	**K remun/employee**[a]	**Intangibles**[a]
After backshoring	-0.011	- 0.007	-0.065**	0.039
	(0.033)	(0.023)	(0.024)	(0.065)
Pretrend test p-value	0.403	0.687	0.400	0.678

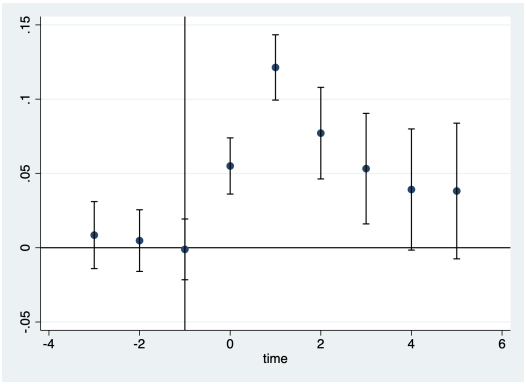
Dep. var:	Blue collar	White collar	Low-experienced workers	Temporary	Turned open-ended
After backshoring	0.006	-0.007	0.016	0.010	-0.001
	(0.005)	(0.004)	(0.006)	(0.006)	(.003)
Pretrend test p-value	0.366	0.929	0.430	0.269	0.917

Dep. var:	Primary	Secondary	Tertiary
After backshoring	0.008	-0.002	-0.003
	(.006)	(0.006)	(0.003)
Pretrend test p-value	0.316	0.059	0.070

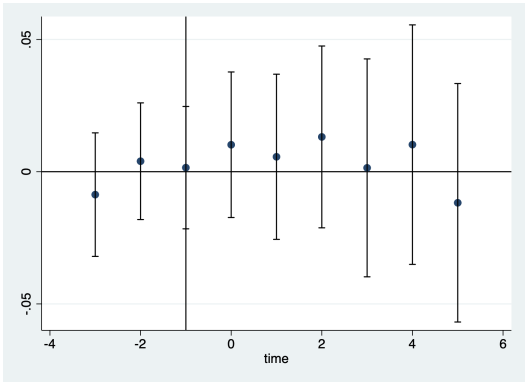
	ISCO level of occupation							
Dep. var:	1	2	3	4	5	6	7	8
	Managers	Professionals	Technicians	Clerks	Service&Sales	Agriculture	Craft	Machine operators
After backshoring	0.001	0.000	-0.000	-0.001	-0.001	0.005	0.002	0.005
	(.001)	(0.001)	(.0029)	(0.004)	(0.002)	(0.005)	(0.004)	(0.003)
Pretrend test p-value	0.024	0.071	0.410	0.474	0.051	0.268	0.060	0.708

[a]Dependent variables in logs. Average treatment effects estimated with the regression-adjusted method by Callaway and Sant'Anna (2021). *p<0.1; **p<0.05; ***p<0.01. Standard error clustered at the firm level in parenthesis. All controls at base year 2008. Controls included: dummy offshoring share ¡ 25% of turnover, dummy import share ¡ 25% of turnover, turnover growth 2005-2007, net purchases growth 2005-2007, log full-time equivalent employment, log turnover per employee, roe, distress dummy, leverage, capital by turnover, firm age, female share, migrant share, part-time share, temporary share, blue collar share, white collar share, middle managers share, other workers share, share workers with less than 15 years of experience, share workers with less than 15 years of experience, 4-digit industry and province dummies. Controls: Never treated offshoring firms.

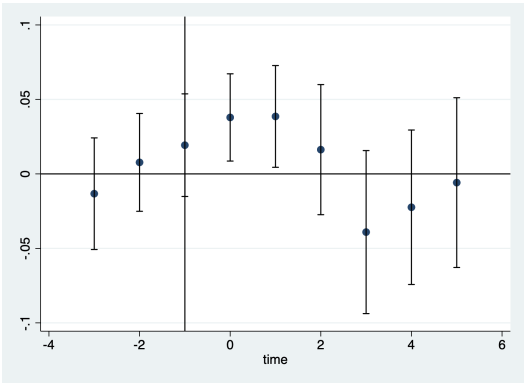
Figure A.3: Backshoring effects on firm performance. First cohort of reshorers excluded



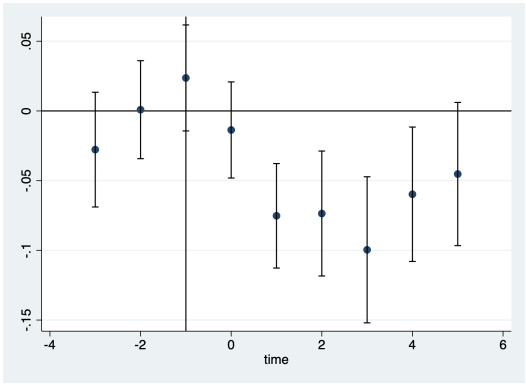
(a) (log) Employment



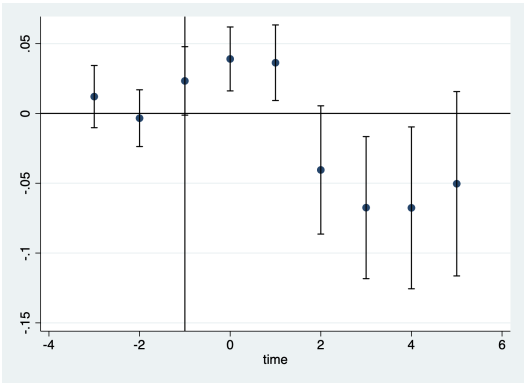
(b) (log) Average firm wage



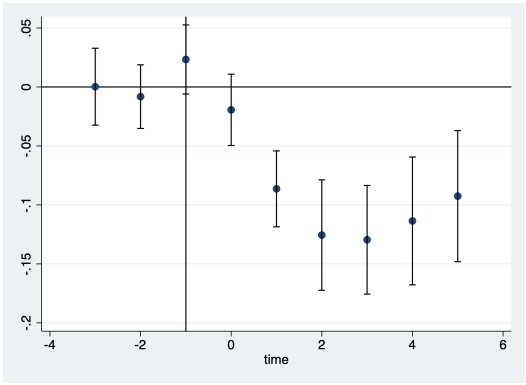
(c) (log) Value added



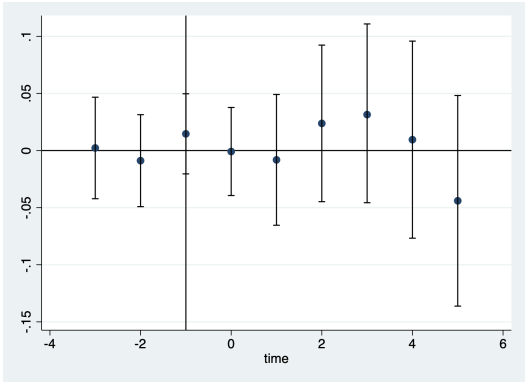
(d) (log) Value added/employee



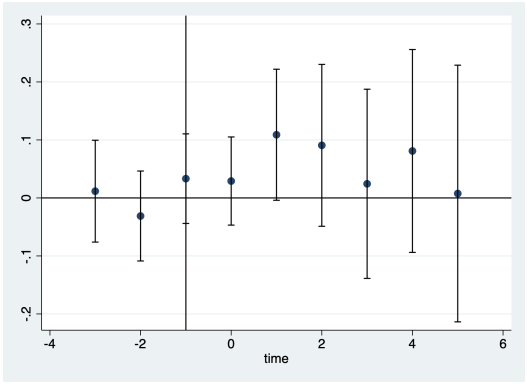
(e) (log) Turnover



(f) (log) Turnover/employee

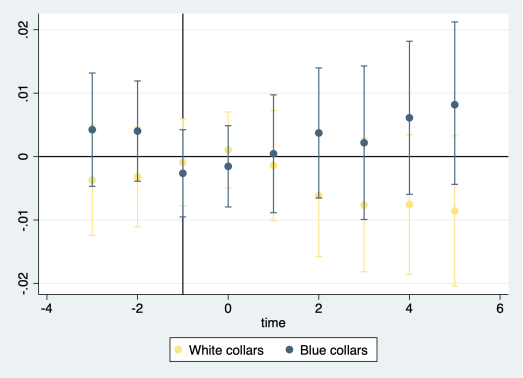


(g) (log) Fixed assets

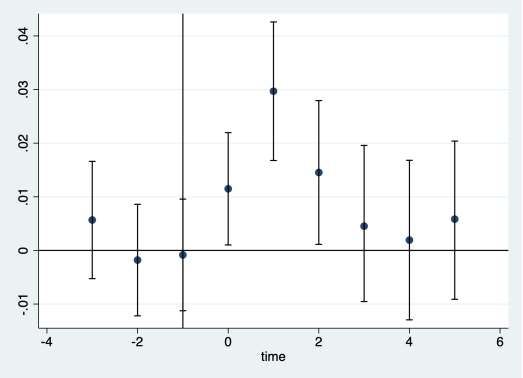


(h) (log) Intangible assets

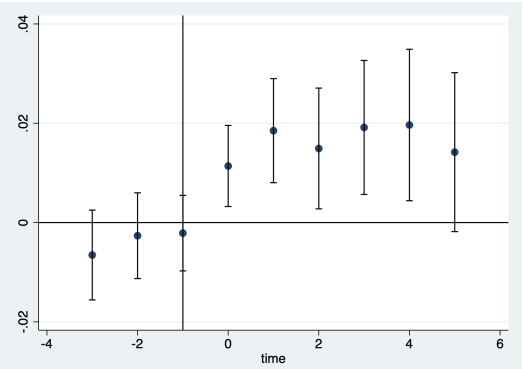
Figure A.4: Backshoring effects on firm composition. Control group: Not yet treated



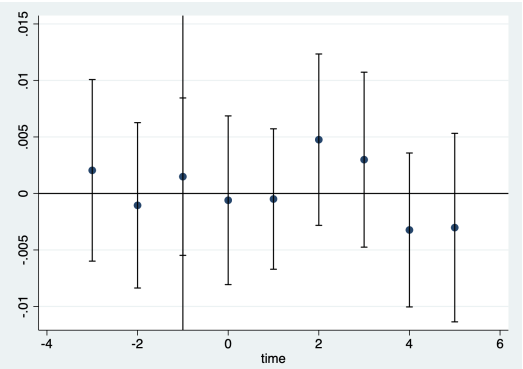
(a) White and blue collar shares



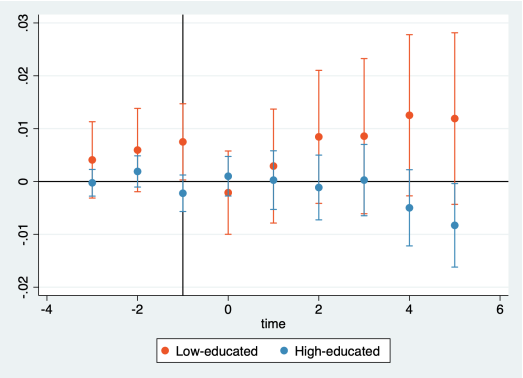
(b) Share temporary workers



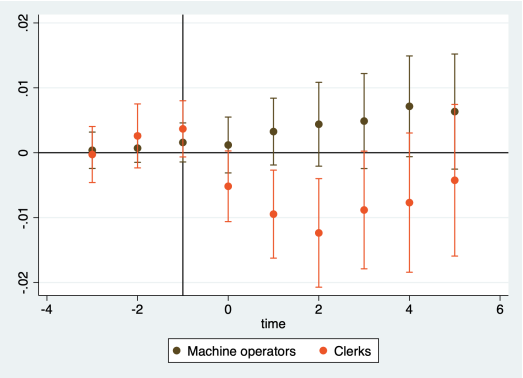
(c) Share low-experienced



(d) Share workers becoming openended



(e) Share high- and low-educated



(f) Share machine operators and clerks

References

Callaway, B. and Sant'Anna, P. H. (2021). Difference-in-differences with multiple time periods. *Journal of econometrics*, 225(2):200–230.