Return to the United States: Impact of Reshoring Announcements and Reshoring Risks on Market Valuation

Abstract

With soaring labor and logistics costs in developing countries, supply chain disruptions during the COVID-19 pandemic triggered Western firms to "reshore" some of their offshore operations (performed in-house or outsourced) for certain strategically important products or production processes from foreign countries to their home countries. Although reshoring can create more domestic jobs and reduce supply chain risks, the impact of various external and internal risks associated with reshoring on market reaction remains unclear. This observation motivates us first to conduct a text mining analysis, revealing four important types of reshoring risks inherent to (1) foreign currency fluctuation, (2) intellectual property (IP) protection, (3) reshoring types (in-house, insourced, or outsourcing-to-outsourcing [OTO]), and (4) reshoring location choice (Republican- vs. Democratic-led states). We then examine how these risk factors help explain the variations in reshoring's market valuation based on 281 reshoring initiatives of 132 publicly traded firms in the United States announced between 2009 and 2022. Our empirical analysis reveals that the market reacts more positively to a firm's reshoring announcement when the firm reshores under a high-currency-fluctuation environment or from countries with weak IP protection. However, the market's reaction is more negative when the firm's reshoring announcement entails insourced reshoring operations or when the reshored location is a Democratic- rather than Republican-led state. We do not find a significant market reaction to OTO reshoring.

Keywords: reshoring; event study; supply chain risk; reshoring types; market valuation

1. Introduction

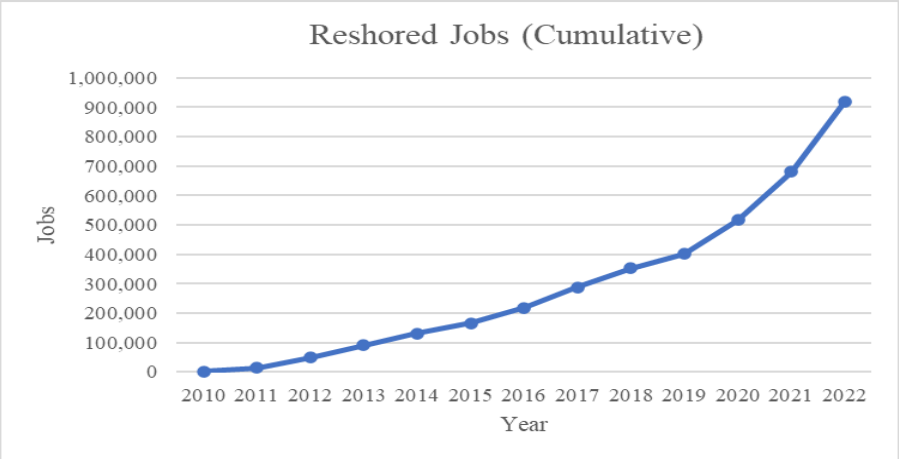
Offshoring and outsourcing can be double-edged swords for Western firms. They offer economic value in lower production costs and market entry opportunities, but they also incur implicit costs in supply chain complexity and opacity (Ellram et al. 2013b, Tate 2014). In some instances, offshore (in-house or outsourced) operations can create collateral damages for a firm when its supplier commits violations of labor laws, worker safety laws, product safety laws, or environmental laws (Sodhi and

Tang 2012). The combination of currency volatility, surging labor costs, and rising logistics costs in developing countries, along with protectionism and nationalism, have propelled various Western firms to "reshore" some of their (in-house or outsourced) operations from offshore foreign countries to their onshore home countries (Ellram et al. 2013a, Gray et al. 2013, Fratocchi et al. 2014, Tate et al. 2014).

When Americans realized that many critical products (e.g. antibiotics, active pharmaceutical ingredients, personal protective equipment) were imported from China during the COVID pandemic, the reshoring movement articulated by the Trump administration in 2016 gained additional momentum. In 2020, 59% of U.S. respondents supported the withdrawal of manufacturing from China (Rapoza 2020). To incentivize firms to reshore, the Trump administration created a business-friendly environment by reducing the corporate tax rate from 35% to 21% in 2018, lower than that of many foreign countries, including India, Brazil, China, Bangladesh, Indonesia, Myanmar, and Russia. With this tax reduction, the Trump administration intended to entice U.S. firms to invest more in the United States and create more jobs (Amadeo 2020). Later, in 2021, President Biden proposed a plan to "implement fundamental reforms, moving a range of critical products back to U.S. soil, creating new jobs, and protecting U.S. supply chains against national security threats (Stumo 2020)." These political pressures and financial incentives prompted more firms to reshore some of their operations, creating more manufacturing jobs in the United States. Figure 1 depicts the manufacturing jobs resulting from reshoring from 2010–2022.

Figure 1. Cumulative Reshoring Jobs in Manufacturing between 2010 and 2022

(Source: Reshoring Initiative 2022 data report)



Although reshoring is a major issue currently being discussed in U.S. boardrooms and government offices, the related research literature is nascent. Most reshoring literature focuses on risk drivers (country, regulation, and reputational risks) for justifying reshoring decisions (Ellram et al. 2013a, Fratocchi et al. 2014, Tate 2014, Foerstl et al. 2016). However, these authors do not link various reshoring-related risk factors to subsequent firm performance. Brandon-Jones et al. (2017), for example, found a positive market reaction based on 37 reshoring announcements without examining how the market reacts to different reshoring strategies, depending on whether offshore operations were initially outsourced and whether the company plans to conduct reshored operations in-house.

To address this research gap, we examine how various reshoring-related risks can affect the abnormal stock returns associated with a reshoring announcement. To do so, we first identify four reshoring risks: (1) foreign currency fluctuation, (2) intellectual property (IP) protection, (3) reshoring types (in-house, insourced reshoring, or outsourcing-to-outsourcing [OTO]), and (4) reshoring location choice (Republican- vs. Democratic-led states). We then examine abnormal stock returns associated with 281 reshoring announcements made by 132 publicly traded U.S. firms between 2009 and 2022, incorporating those reshoring risks as moderating factors.

Our empirical analysis reveals that the market reacts to a firm's reshoring announcement more positively when the firm reshores under a high currency fluctuation environment and/or from countries with weak IP protection. However, the market reacts more negatively when the firm's reshoring announcement entails insourced reshoring operations or when the reshored location is a Democratic-led state (vs. a Republican-led state). However, we do not find a significant market reaction to OTO reshoring announcements.

This paper is organized as follows: section 2 presents a theoretical foundation, identifying reshoring risk factors and strategies for firms; section 3 presents our hypotheses and research framework based on the market reaction to reshoring strategy announcements; section 4 describes our data collection process; section 5 presents the results and robustness analyses; and section 6 discusses the implications of our findings and presents our conclusion.

2. Supply Chain Risks and Transaction Cost Economics

Reshoring is a strategy for reducing supply chain risks (Ciabuschi et al. 2019), including political,

operations, resource, security, macroeconomics, and competitive risks (Manuj and Mentzer 2008). Reshoring decisions often aim to reduce supply-chain-related and cross-border transactional uncertainties. Firms with offshore operations frequently encounter risks involving politics, IP protection, regulatory stability, legal enforcement, and infrastructure and property protection, as well as other financial and operational risks of production in overseas countries (Blackhurst et al. 2008, Tang and Tomlin 2008, Wagner and Bode 2008). At the same time, reshoring risk factors include uncertainty related to domestic operations, such as the setup or expansion of new plants and changes in make-or-buy decisions (Ciabuschi et al. 2019), as well as a potential lack of local government support and availability of technical and skilled laborers (Hartman et al. 2017).

Reshoring enables firms to build resources and capabilities closer to home (McIvor and Bals 2021) and involves strategies for upgrading manufacturing capabilities and reconfiguring operational systems (Ancarani and Di Mauro 2018). Reshoring also allows for colocation of research and development (R&D), production and other functions usually performed at company headquarters, such as product development and strategic plans (McIvor and Bals 2021). In recent decades, the gap in labor costs has narrowed between emerging and advanced economies, motivating firms headquartered in developed countries to reshore. For example, in the past two decades, the average annual wage of Chinese workers increased by over 14 times from US$1,127 in 2000 to US$16,153 in 2021 (Ezrati 2022). Firms that rely heavily on offshore operations also face significant uncertainty regarding logistics costs and transportation lead time due to the geographical distance between production facilities and delivery locations and the complexity of cross-border transactions. A fast-paced and efficient production and supply chain system requires close coordination and cooperative problem-solving between production facilities and corporate headquarters, in addition to rapid market adjustment (Gray et al. 2015). These needs increase the costs of offshore operations and favor reshoring (McIvor and Bals 2021).

Transaction cost economics (TCE) explains how firms seek to reduce the cost of economic transactions and how governance structures help reduce transaction costs (Williamson 1991). The TCE framework guides executives in outsourcing, offshoring, and reshoring decisions. From the TCE perspective, supply chain risk monitoring and mitigation help firms lower overall transaction costs

(Blome and Schoenherr 2011). Reshoring may improve geographical proximity between the headquarters and production facilities, reducing uncertainty related to foreign operations (e.g., political and regulatory uncertainties) and mitigating risks in multiple supply chain processes. However, it may trade off labor costs and other advantages in offshore locations (e.g., low-cost facilities, lax environmental regulations overseas). As global supply risks and uncertainty from offshore operations increase, firms prefer reshoring to reduce transaction costs (Foerstl et al. 2016).

Supply chain disruption risks, regulatory environments, and currency fluctuation all increase complexity and coordination costs (McIvor and Bals 2021). Global political and economic uncertainties, trade conflicts, and IP infringement risks further increase the need for closer governance and monitoring of production, making reshoring a feasible strategy to decrease transaction costs, reduce risk, and increase operational efficiency. In particular, complex, multidimensional, and recurring cross-border transactions can be expensive to manage under high levels of global, political, and economic uncertainty (Ketokivi and Mahoney 2017, Ketokivi and Mahoney, 2020). In a high-risk context, offshore operations of complex supply chains become less attractive, while reshoring is more likely to reduce governance costs and enhance transactional efficiency (Chiles and McMackin 1996, Ketokivi and Mahoney 2017). According to the TCE framework, reshoring benefits increase with the global risk level in the supply chain, sourcing, and purchasing.

2.1. Identification of Risk Factors

To identify the most critical risk concerns that affect firms' offshore operations and reshoring decisions, we conducted a text mining analysis by examining annual reports of reshoring firms. For this study, we used text mining on firms' annual reports to identify potential predictors and variables (Shirata et al. 2011, Lee and Hong 2014, 2016). We first searched the Reshoring Initiative database (located at reshorenow.org) and identified 149 publicly listed firms that had released reshoring announcements between 2009 and 2022. We then downloaded the annual reports published by these 149 firms in the year before each one's first reshoring announcement to investigate the firms' decision contexts leading up to their reshoring announcements. Our text mining analysis was focused on the "Risk Factors" sections of the annual reports (a total of 69,418 words) because our objective is to understand firms' risk concerns.

The text mining process includes document retrieval, data preprocessing, data analysis, and identification of critical risk factors (Aggarwal and Zhai 2012, Agrawal and Batra 2013, Gaikwad et al. 2014). We first used the text mining software Orange[1] to analyze the text extracted from the 149 annual reports,[2] then visualized the result with a word cloud and highlighted the most frequent risk factors for reshoring (Appendix A.3). Finally, we identified the top risk factors (i.e. words and phrases) with the highest weight (i.e. frequency of appearance). Words and phrases with similar meanings, such as "exchange fluctuation" and "fluctuation [of] currency," were grouped together.[3] One limitation of using word cloud frequencies is that the method requires researchers to group similar words and phrases into a few categories or topics. We therefore supplemented the word cloud analysis with latent Dirichlet allocation (LDA) to avoid potential misinterpretation or biases. LDA is a natural language processing technique that uses an unsupervised Bayesian machine-learning algorithm to classify related topics in texts without requiring researchers' judgments to classify words and phrases (Huang et al. 2018). Instead, the LDA technique models words' co-occurring probabilities under a theme to identify potential topics. For this purpose, we adopted Mallet, an open-source LDA tool kit for topic modeling (Kaplan and Vakili 2015, Dyer et al. 2017). As shown in Table 1, the keywords of the top four major topics generated via LDA are highly similar to those in the word cloud, supporting the importance of these four risk factors for reshoring firms.

Table 1. Top Four Risk Factors Generated by Word Cloud Analysis and LDA Topic Modeling

Topic area	Keywords generated from word cloud analysis	Keywords generated from LDA topic modeling	Examples from reshoring companies' annual reports
Currency exchange	**currency exchange**, **fluctuation exchange, fluctuation currency**, foreign **currency**, **exchange** control	**currency exchange fluctuations** rates currencies costs dollars businesses expenses financial	"**Foreign currency exchange** rates and **fluctuations** in those rates may affect the Company's ability to realize projected growth rates. . . . Company's results of operations could be adversely affected if the U.S. dollar strengthens significantly against **foreign currencies**" (*3M, 2011*)

[1] Orange is an open-source data mining, machine learning, and data visualization tool kit (Demšar et al. 2013, Ciabuschi et al. 2019).

[2] Text preprocessing functions, including transformation, tokenization, normalization, and filtering, are used to analyze the dataset (Vijayarani et al. 2015).

[3] To reflect the actual weight of the word cloud for risk factors, we reviewed the top 100 phrases with the highest frequencies (a total frequency of 2,652 for the top 100 phrases) and consolidated similar phrases based on the risk factors in the annual report. After grouping similar phrases, we identified the top four risk factors with the highest weights. A list of keywords identified under these four topics is shown in the first column of Table 2. These keywords are associated with business environment (weight = 479), currency exchange (weight = 412), IP (weight = 397), and manufacturing- and sourcing-related topics (weight = 311), which account for 60% of the total frequency.

Business environment	**economic political**, **international regulations,** government contract, **political regulatory**, compliance regulation	**international regulations political tax** operations laws risks U.S. trade financial	**"regulatory**, **tax** or **government incentive** policies impacting the timing of customers' investment in new or expanded fabrication plants" (*Applied Material Inc., 2021*)
Intellectual property	**Intellectual property, protect intellectual property**, difficulty intellectual property	**intellectual rights property** patents infringement trademarks patent protect third-party parties	"defend against **intellectual property** infringement claims or misappropriation claims, which may be time-consuming and expensive . . . business may be adversely affected if we are unable to **protect our intellectual property** rights from unauthorized use by **third parties**" (*Canoo Inc., 2020)*
Manufacturing and sourcing	**manufacturing product**, **material** business, manufacturing **facility**, customer **supplier**, staff manage, difficulty staff	**manufacturing products facilities suppliers materials** costs labor delays transportation sourcing	"Several of our key **raw materials** and components are either single-sourced or sourced from a limited number of **suppliers**, and their failure to perform could cause **manufacturing delays**" (*First Solar, 2018*)

2.2. Contextualization of Risk Factors

We contextualized the top four risk factors shown in Table 1 in our research (summarized in Table 2) as follows. First, note that currency exchange-related topics receive one of the highest weights. Because the fluctuation in currency exchange rates increases the uncertainties of doing business across national borders, we contextualized this risk factor as foreign currency fluctuation and measured it according to the volatility of the currency of offshore countries against the U.S. dollar. Indeed, a survey of 300 executives on the motivation behind reshoring decisions shows that currency fluctuation is "the factor considered to provide the greatest risk" (White and Borchers 2016, p. 208). High fluctuation in foreign currency value makes offshore operations more uncertain and less favorable, so we expect that investors would be more welcoming to a reshoring announcement under such a circumstance.

Second, we observed that IP risk is of particular concern to many U.S. manufacturers who offshored their manufacturing activities to developing countries with weak IP protection, which later motivated them to reshore these activities back to the United States (Locke et al. 2013, Skowronski and Benton 2018). For instance, in 2013, General Electric (GE) shifted its production back to the United States due to IP disputes and ease of design collaboration (Vanchan et al. 2018). We thus captured this risk factor as foreign IP protection risk and measured it based on the strength of IP protection in a foreign country relative to that of the United States. If a U.S. firm reshores from a foreign country with relatively weak IP protection, investors will support this move because it helps protect the firm's valuable IP assets.

Third, when making reshoring decisions, firms may need to consider moving their overseas in-house or outsourced manufacturing activities back to the United States as in-house operations. Alternatively, firms may simply move their outsourced or in-house operations overseas to local suppliers through OTO or in-house-to-outsourcing reshoring, respectively. In our paper, we examine different types of reshoring, including in-house reshoring, insourced reshoring, and OTO reshoring; we do not find any *in-house-to-outsourcing* reshoring in our sample, and compare their operations and risk implications. In-house-to-in-house reshoring involves no change in firms' sourcing strategy, as firms continue to adopt "make" strategies after moving from foreign countries to the United States. Meanwhile, adoption of insourced (i.e. outsourced-to-in-house) reshoring requires firms to make a change from "buy" in foreign countries to "make" in the United States, which may pose more risks and be perceived as a riskier move. For example, GE's insourced reshoring strategy, which moved the company's outsourced production activities in China and Mexico back to in-house production in the United States, cost the firm $1 billion. Jeff Immelt, GE's CEO, described the move as "as risky an investment as [the company] has ever made" (Crooks 2012).

OTO reshoring strategies are considered low-risk, as firms practicing OTO reshoring continue to adopt "buy" strategies, because products and components remain outsourced after reshoring, with the only difference being production location. Therefore, we expect investors to react more positively to low-risk OTO reshoring and relatively less positively to the more uncertain and riskier practice of insourced reshoring. Outside of these three reshoring strategies, we also conjecture that the market might react less favorably to in-house-to-outsourcing reshoring. Conceptually, firms that used to have in-house production offshore may decide to close their overseas operations and subcontract them to U.S. suppliers, requiring a major strategic change from "make" to "buy" and incurring risks that may include the sunk cost of offshore equipment, restructuring of manufacturing operations, and unsure reliability and supply capacity in the United States. This major change involves risks, which may trigger a negative market reaction towards in-house-to-outsourcing reshoring.

Business environment-related topics appear to be a factor associated with reshoring. Due to a common belief that Republican-led U.S. states generally provide more a more business-friendly environment (via state-level regulatory factors such as lower taxes, business incentives, and

investment benefits) than Democratic-led states (Dye 1984, Reed 2006, Grossmann et al. 2021), we expect that a firm that chooses to reshore to a Democratic-led state may receive less support and face higher regulatory and policy risks, which could create a negative market reaction.

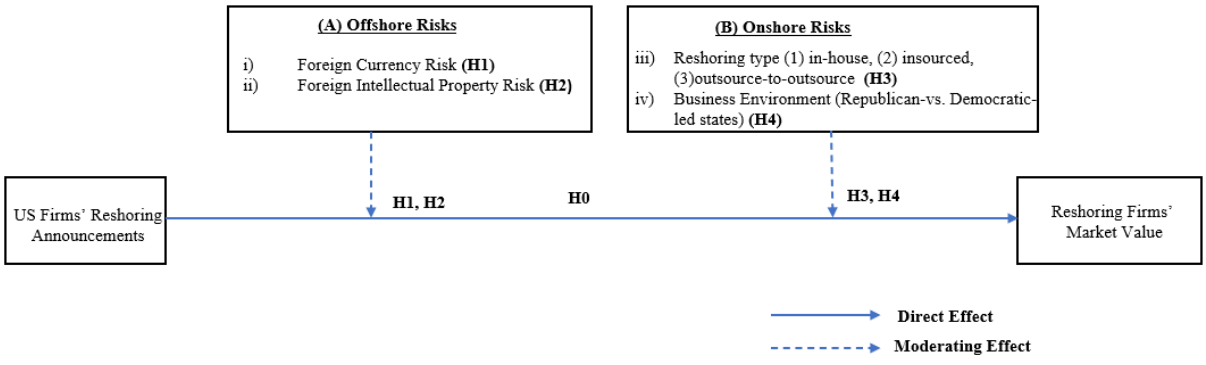
Table 2. Reshoring Risk Factors and Potential Investor Reaction

	(A) Offshore risks		**(B) Onshore risks**	
Risk factors	(i) Foreign currency fluctuation	(ii) Foreign IP protection	(iii) Reshoring types (in-house, insourced, and OTO reshoring)	(iv) Business environment (Republican- vs. Democratic-led states)
Potential investor reaction	If the currency of offshore countries is more volatile relative to the U.S. dollar, investors will react to reshoring more positively.	If IP protection is weak in offshore countries relative to the United States, investors will react to reshoring more positively.	If a firm adopts insourced reshoring that involves a change from outsourcing to in-house production, investors will react less positively. Meanwhile, OTO reshoring may be perceived as a low-risk move, causing investors to react more positively.	If a firm reshores to a Democratic-led state that is perceived as relatively less business-friendly than a Republican-led one, investors will react less positively.

3. Hypothesis Development

We first formulate a basic hypothesis (H0) concerning the general relationship between U.S. firms' reshoring announcements and their market valuation. We then develop four hypotheses (H1 to H4) focusing on how those aforementioned risk factors affect the relationship between reshoring announcements and market valuation. Figure 2 depicts our research framework and hypotheses.

Figure 2. Research Framework



3.1. Reshoring Announcement and Market Valuation

There are several risks involved in reshoring. First, despite reduced wage gaps between the United States and other countries, most offshore manufacturing locations, including India, Mexico, and Vietnam, still have significantly lower labor costs (Fromm et al. 2020). Moving production to the United States requires firms to hire employees in the United States to operate the new or expanded

facilities, which can be substantially more expensive than operations offshore. Reshoring firms also need to ensure the availability of skilled laborers and experienced professionals at their U.S. sites, not to mention appropriately restructured and localized supply chain networks (Shih 2014, Engström et al. 2018). Transitioning production back to the United States also involves various upfront expenses, such as setup and exit costs, that pose significant hurdles to reshoring firms.

Despite the potentially higher labor and production costs, however, reshoring often also involves strategic repositioning and enhancement of firms' supply chains, manufacturing capabilities, and product images, which investors will likely anticipate positively. Reshoring may enable firms to achieve greater control over their supply chains, allowing them to manage their production capacities and inventories more effectively (Brandon-Jones et al. 2017). Additionally, reshoring may reduce supply chain disruptions caused by international transportation and transactions, as well as cross-border regulatory issues with customs clearance and tariffs (Krenz et al. 2021, Moradlou et al. 2021). Because of the geographical proximity of reshored headquarters to production facilities, bringing back operations from offshore locations may spur innovation through reduced physical and cultural distances among product design, R&D, and production units (Ancarani et al. 2015, Ashby 2016, Albertoni et al. 2017). Finally, reshoring to the United States may improve brand image, particularly when production was initially located in developing countries whose manufacturing is associated by investors with an impression of low quality. These potential benefits of reshoring suggest that investors will react positively to a reshoring announcement, motivating the first hypothesis as follows:

H0: *The stock market reacts positively to a firm's reshoring announcement*.

3.2. Offshore Risk (i): Foreign Currency Risk

In the outsourcing literature, currency exchange volatility has always been an essential risk factor that influences offshoring decisions (Tang and Musa 2011, Chen et al. 2014). Currency fluctuations have direct economic implications (Viaene and De Vries 1992, Chen et al. 2014, Hu and Motwani 2014) that can affect offshoring (Katada and Henning 2014) and reshoring decisions (Viaene and De Vries 1992, Chen et al. 2014, Hu and Motwani 2014). Specifically, foreign currency risk, including transactional and operating exposures, is a severe concern for multinational firms (Chow et al. 1997, Pantzalis et al. 2001). Transactional currency risk refers to potential financial loss when

firms' foreign assets and investments are translated into domestic currency. Operating currency exposure is related to the risk of varying production costs and incomes for firms operating in a foreign country with fluctuating exchange rates. Firms prefer stable foreign exchange rates because fluctuating offshore currency values make long-term investments, production costs, and business plans unpredictable (White and Borchers 2016). For example, Sherrill Manufacturing, Inc. moved its production from Mexico to New York because of the cost uncertainty associated with the fluctuations of the Mexican peso (Commerce 2019). Meanwhile, the appreciation of China's currency from 2005 to 2014 increased the cost of labor and other expenses associated with manufacturing operations, such as the costs of land, utilities, and logistics. This observation motivates the following hypothesis:

H1: *The stock market reaction to reshoring announcements is more positive when the firm reshores in the presence of high foreign currency risk.*

3.3. Offshore Risk (ii): Foreign IP Risk

Many U.S. firms have relocated their R&D centers (Hemphill 2005, Motohashi 2010, Nieto and Rodríguez 2011, Liu and Chen 2012) to offshore production locations in the past two decades, motivated by cheaper intellectual capital available in foreign countries such as China, India, and Mexico (Fifarek et al. 2008, Lewin et al. 2009, Nieto and Rodríguez 2011). However, doing so increases the risk of IP infringement due to weak patent enforcement in some offshore countries (Locke et al. 2013). Offshore suppliers who gain tacit knowledge of product innovation, design, and production techniques may eventually become competitors. For example, IP infringement severely threatens plastic tooling, molding, and manufacturing firms. Original tooling designs are expensive, but offshore suppliers can duplicate them easily. Some firms register their patents and brand trademarks in offshore countries to avoid this problem, but IP law enforcement is weak in offshore countries (Tate et al. 2014). According to the Commission on the Theft of American Intellectual Property,[4] annual costs from IP losses range from $225 billion to $600 billion. Indeed, foreign IP risk motivates many reshoring decisions. For instance, X-Cell Tool & Mold, LLC, was unable to produce whole molding components with overseas suppliers to appropriately protect customers' IP

[4] https://www.nbr.org/wp-content/uploads/pdfs/publications/ip_commission_2021_recommendations_mar2021.pdf.

(Goldsberry 2010). Another steel mold manufacturer, Marlin Steel, suffered enormous losses from IP disputes with overseas suppliers (Dhue 2018). In brief, the shortfall of IP protection contributes to supply chain risks in offshore operations. Several studies suggest IP protection is a key driver for reshoring (Ellram et al. 2013b, Gray et al. 2013). The U.S. Chamber International IP Index 2021[5] indicates that the U.S. legal system provides better IP protection for firms than most developing countries. Therefore, reduction of foreign IP risk is a motivating factor for firms considering reshoring. These observations motivate us to propose the following hypothesis:

H2: *The stock market reaction to a firm's reshoring announcement is more positive when the firm reshores from a foreign country with high IP risk.*

3.4. Onshore Risk (iii): In-House, Insourced and OTO Reshoring

Recall from Section 2.2 and Table 2 that in-house reshoring and OTO reshoring (moving from offshore outsourcing to onshore outsourcing) involve no major change in firms' sourcing strategy. By maintaining the "make" sourcing strategy, in-house reshoring enables a firm to retain its tacit production knowledge as it moves production from overseas to the United States. A firm that closes its foreign factory and establishes a factory in the United States may also transfer its offshore management team back to the United States. The latest production-related knowledge and experience acquired from offshore plants would bring valuable experience in establishing new production processes in the U.S. (Thomas et al. 2007, Wan et al. 2019), reducing overall reshoring risk. Furthermore, managerial staff and technicians transferred to the U.S. facilities via in-house reshoring could train skilled laborers faster than would be possible in insourced reshoring and thereby reduce risk. Similarly, by focusing on the "buy" sourcing strategy, firms adopting OTO reshoring maintain their expertise in sourcing and supply chain management.

On the other hand, insourced reshoring (i.e. outsourcing-to-in-house reshoring) is likely to be a riskier strategy. Adopting an insourced reshoring strategy requires firms to make a major change in their strategy, from "buy" to "make." Firms attempting insource reshoring will likely need additional expertise in setting up and running a new plant locally, which will incur higher production setup costs

[5] https://www.theglobalipcenter.com/report/ipindex2021.

(Whitten et al. 2010), including the costs for candidate searches, personnel replacement, in-house learning, and information transfer, leading to higher uncertainty (Whitten et al. 2010, Patrick Van den et al. 2014).[6] In particular, reshoring often involves major supply chain restructuring, while insourcing requires the development of specific production processes (Barbieri et al., 2022). Carrying out both plans simultaneously may incur extra risks to firms' operations. These observations motivate the following hypothesis:

H3a: *The stock market reaction to a firm's reshoring announcements is less positive when the firm adopts insourced reshoring.*

An OTO reshoring strategy may be perceived to have low risk, because it does not involve a major change in a firm's sourcing or make-or-buy strategies. OTO reshoring also enables firms to build resources and capabilities close to home and reduce risks caused by foreign operations (Stentoft et al. 2018. Additionally, unlike in-house or insourced reshoring, OTO does not require major capital investments in setting up or expanding production plants (Gunasekaran et al., 2015; Barbieri et al., 2018). An OTO reshoring strategy helps maintain firms' sourcing practice and strategic flexibility, preserve their expertise in sourcing and supply chain coordination, reduce the cost of assets, and lower administrative and overhead burdens (Benstead et al. 2017, McIvor and Bals 2021). Because it does not require expertise in setting up and running new plants, OTO also reduces the firm's operational uncertainty (Barbieri et al. 2022). In short, OTO is a reshoring strategy that involves lower levels of capital investment and operational disruptions than other strategies, reducing firm risk.

H3b: *The stock market reaction to a firm's reshoring announcements is more positive when the firm adopts OTO reshoring.*

3.5. Onshore Risk (iv): Reshoring to Democratic- vs. Republican-led States

Reshoring is a capital-intensive decision, and reshoring firms face a higher risk if the political-economic environment is unfavorable. Politically-influenced business factors, including government subsidies, tax benefits, and labor supplies, can influence a firm's reshoring decision (Sarder et al. 2014, Tan and Chintakananda 2016, Weng and Peng 2018, Rasel et al. 2020). In the United States, the

[6] Studies show that additional costs from the disruption of previous routines outweigh the benefits of restructuring (Karim and Mitchell 2004, Girod and Whittington 2017).

Republican and Democratic parties hold differing beliefs about economic policy and regulations, corporate taxes, and the role of government, which translates into different policy preferences and platforms between states whose governments are run by different parties. (Besley and Case 1995, Belo et al. 2013, Pástor and Veronesi 2020).

Political scientists (Quinn and Shapiro 1991, Halvorsen and Jakobsen 2013) believe that Republicans generally prefer an investment-driven (supply-side) growth model through direct business-friendly measures such as low general corporate and capital taxations, whereas Democrats favor a consumption-driven (demand-side) growth model. Under such an investment-driven model, the key is to address production costs for business and attract and retain firms, especially in manufacturing industries (Reed 2006). Relevant measures include direct grants or subsidies for businesses, state incentives to promote R&D, low-interest loans, subsidized training of employees, and discounted land cost. Recent research shows that the election of a Republican as governor has a significant positive impact on net investment inflows in the manufacturing industries (Wang and Heyes 2022). By contrast, some studies find that state taxes, including corporate taxes, tend to increase significantly during the tenure of Democratic governors (Besley and Case 1995).

State corporate tax rates in the United States varied between 0% and 11.5% in 2022. South Dakota and Wyoming are Republican states without a corporate income tax, whereas the Democratic-led states of New Jersey and Pennsylvania levy the highest corporate tax rate, creating a less business-friendly environment for reshoring. Meanwhile, traditional Republican stronghold states such as Tennessee and South Carolina provide reshoring-friendly environments with production subsidies and greater labor availability. For example, Louis Hornick reshored to South Carolina and received support for skilled labor and an extensive infrastructure network (S. C. Department of Commerce 2013). To avoid a deficit of skilled labor, South Dakota partnered with reshored firms to provide skilled laborers for new or rebuilt facilities (Lammers 2019). Examples like these often become strong reference points for other firms' reshoring location choices in the future. These observations motivate the following hypothesis:

H4: *The stock market reaction to a firm's reshoring announcement is less positive when the firm reshores to a Democratic-led (rather than Republican-led) state.*

4. Data Sources and Variables

In this section we present data collected on reshoring announcements, the measurements of the four reshoring risks, and various control variables.

4.1. Reshoring Announcements

We collected reshoring announcements made by publicly listed U.S. firms, focusing on firms headquartered in the United States that had previously manufactured in that country before offshoring production. These reshoring announcements were compiled through the Reshoring Initiative.

4.2. Data Cleaning and Checking

Of the 1,483 reshoring announcements identified, we removed 1,076 announcements involving 260 duplications (the same news reported by several sources), 390 instances of insufficient information (e.g. lacking specific date or location of reshoring), and 426 non-U.S.-headquartered firms (e.g. Toyota), resulting in a sample of 407 reshoring announcements. We further identified and removed reshoring announcements with confounding events that might affect firms' market value and confuse the interpretation of the test results (Ramasubbu et al. 2019). Specifically, we searched Factiva for each of the 407 reshoring announcements to check if any confounding events occurred between 10 days before and 10 days after the reshoring announcement (i.e. Day −10 to Day 10). Confounding events for this analysis included lawsuits, mergers, dividend declarations, changes in key executive roles, unexpected earnings, product recalls, and acquisition announcements (McWilliams and Siegel 1997). Through our Factiva search we identified and removed 124 reshoring announcements with confounding events, and we further deleted two outliers,[7] leaving 281 (407 − 124 − 2) reshoring announcements from 132 publicly listed U.S. firms for further analysis. The detailed step-by-step data cleaning process is presented in Appendix Figure A.1.[8]

[7] Based on extreme cumulative abnormal return (CAR) values outside +/− 3* interquartile ranges (Schwertman et al. 2004).

[8] A major concern arising from our data-cleaning process is that the reshoring firms remaining in the test sample could be quite different from those removed due to insufficient information and confounding events, which might hurt the generalizability of the test results. To address this concern, we conducted several independent sample *t*-tests to compare the remaining and removed reshoring firms. Our comparison covered a comprehensive set of firm-level measures, including the number of employees, total assets, sales, operating expenses, total liabilities, and total inventories. The independent sample *t*-test results suggest no significant difference between the remaining and removed reshoring firms across all six firm-level measures ($p > 0.1$; not tabulated), providing no evidence of sampling bias and improving confidence in the generalizability of our test results.

4.3. Classification of Reshoring Announcements

Following Gray et al. (2013), we classified those 281 announcements into four different types: (1) in-house reshoring, (2) insourced reshoring, (3) in-house-to-outsourcing reshoring, and (4) OTO reshoring.[9] Among the 281 reshoring announcements, 216 are classified as in-house reshoring (type 1), 36 are insourced reshoring (type 2), 29 are OTO reshoring (type 4), and none involve in-house-to-outsourcing reshoring (type 3). The distribution of these 281 reshoring announcements over the studied period is shown in Appendix Table A.2.

4.4. Financial Data

For the sample firms making the 281 reshoring announcements, we collected financial, stock price, and market index data from the S&P COMPUSTAT and Bloomberg databases. The firms' annual reports provided information on the headquarters and affiliate office locations. Table 3 provides descriptive statistics of firms' financial performance in the year prior to the reshoring announcements.

Table 3. Descriptive Statistics of Sample Firms

Variables	Mean	Median	Std. deviation	Minimum	Maximum
Total assets (in millions USD)	105,804.02	19,351.00	177,550.44	13.41	781,818.00
Number of employees in thousands	144.83	50.70	371.07	0.08	2,300.00
Net income (in millions USD)	5,056.87	1,115.00	9,172.69	−22,355.00	57,411.00
Sales (in millions USD)	62,671.68	18,143.00	97,516.48	21.19	511,729.00
Debt/equity ratio	1.73	0.77	13.65	−139.75	173.43
Market value (in millions USD)	90,335.40	30,435.92	178,527.42	3.85	1,966,078.92
Return on assets	0.13	0.11	0.09	−0.26	0.60

4.5. Stock Market Reaction

We adopted the short-term event study methodology to quantify stock market reaction to a firms' reshoring announcements in terms of abnormal returns (Hendricks and Singhal 2003, Lo et al. 2018). We used the daily stock data to calculate abnormal returns, which allowed for estimating the

[9] The detailed classification processes and procedures can be found in Appendix A.4a and A.4b.

percentage change in stock prices associated with an event after adjusting them in accordance with market-wide movements (Sorescu et al. 2017). Following the general approach to conducting short-term event studies (Jacobs et al. 2010), we used calendar days as event days and Day 0 as the date when the reshoring announcement was made (before market closing time). Then we presented a three-day event period and examined the daily effect of all reshoring announcements on abnormal returns from Day −1 to Day 1.[10] Following previous studies (McWilliams and Siegel 1997, Wood et al. 2017), we used a two-day event period that includes both announcement day (Day 0) and the trading day after the announcement (Day 1) to ensure sufficient time for market response, particularly if announcements were made near market closure. Because the measurement window was more than one day, we added up the daily abnormal returns in the event window to obtain a cumulative abnormal return (CAR). In the next section, we work further with a cross-sectional analysis of CARs. The CAR is the sum of the daily mean abnormal stock return (AR) over the measurement window (t0, t1):

$$CAR_{i_{(t0,t1)}} = \sum_{t=t_0}^{t_1} AR_{it}. \qquad (1)$$

To compute the daily mean abnormal stock return ($\bar{AR}_{it}$), we used Fama and French's three-factor model to estimate abnormal returns by considering three factors—market risk, market capitalization, and book-to-market ratio—and by assuming a linear relationship between the return of any stock and these three factors over time (Fama and French 2021).[11] We also used a 200-day estimation period (from Day −210 to Day −11) to compute the expected return for each firm. We eliminated firms with less than 40 days of stock price data to ensure accuracy (Jacobs et al. 2010). To protect the estimate against the effects of the announcement and ensure nonstationarity, we ended the estimation period 11 trading days before the event day (Jacobs et al. 2010). The difference between the expected and actual return is the abnormal return for firm *i* on day *t*. The following formula shows

[10] The three-day window is a widely adopted standard in various short-term event studies of abnormal stock returns in different events-related research (Hendricks et al. 1995, Klassen and McLaughlin 1996, Paulraj and de Jong 2011, Ba et al. 2013, Lam et al. 2016b, Lo et al. 2018).

[11] For robustness checks, we also considered the market model and the four-factor model. The market model is built on the actual returns of a reference market and the correlation of the firm's stock with the reference market. Similar to the three-factor model, the market model assumes a linear relationship between any stock return and that of the market index over a given period (Scholes and Williams 1977). The four-factor model extends the three-factor model by adding monthly momentum to the regression (Carhart 1997). The calculations for the mean abnormal return and CAR over a given time period are the same as in Equations (1) and (2). Further details are provided in Appendix Tables A.5 and A.6.

how *it* is estimated using the Fama–French three-factor model:

$$AR_{it} = R_{it} - (\alpha_i + R_{ft} + \beta_{i1}[R_{Mt} - R_{ft}] + \beta_{i2}SMB_t + \beta_{i3}HML_t + \varepsilon_{it}), \quad (2)$$

where R_{it} is the actual return for firm *i* on day *t*, the formula in the parenthesis is the expected return based on the three-factor model, and R_{ft} and R_{Mt} are the risk-free rate and market return on day *t*. SMB stands for small minus big (market capitalization), and HML stands for high minus low (book-to-market ratio) return on day *t*. β is the factor's coefficient, and ε_{it} is the error term.

To test the presence of abnormal returns, we conducted both parametric (*t*-test) and nonparametric tests. We used nonparametric tests, such as the Wilcoxon signed rank (WSR) test and binomial sign test, to compare the abnormal median return and determine whether positive or negative abnormal returns occurred during the event periods.

4.6. Measuring the Four Risk Factors

We conducted a cross-sectional regression with the CAR as the dependent variable to estimate the impact of various risk factors. We measured those four reshoring risk factors as stated in Table 2: (i) foreign currency risk, (ii) foreign IP risk, (iii) reshoring type (i.e. in-house, insourced, or OTO), and (iv) business environment (i.e. reshoring to Democratic- vs. Republican-led states).

4.6.1. Offshore Risk (i): Foreign Currency Risk

To measure foreign currency risk, we used the Bloomberg Dollar Spot Index (BBDXY) to measure foreign countries' currency volatility against the U.S. dollar. Unlike the U.S. Dollar Index, which focuses on leading global currencies, the BBDXY measures developed and "emerging 10" trading foreign market currencies, including the Indian rupee, the Mexican peso, and the Chinese renminbi, against the U.S. dollar. These emerging markets are involved in our reshoring announcement event study and their currencies' values affect reshoring decisions. For this reason, we used BBDXY to calculate the past 12 months' volatility (coefficient of variation) using the ratio of the monthly standard deviation of foreign currency exchange rate to the monthly average foreign currency rate against the U.S. dollar for the previous 12 months (De Santis and Gerard 1998, Benita and Lauterbach 2007). Foreign currency risk is higher when foreign currency volatility is higher, which favors reshoring.

4.6.2. Offshore Risk (ii): Foreign IP Risk

Firms may lower foreign IP risk by reshoring to the United States from countries with low IP protection (Skowronski and Benton 2018, Anand and Goyal 2019). IP risk covers high-tech production processes and trade secrets like recipes for food manufacturing or plastic molding design. To measure foreign IP risk, we used the International Property Rights Index's (IPRI) IP rights score developed by Property Right Alliance[12] (Dombrovsky et al. 2019).[13] This index consists of three indicators of IP protection in a country: (1) protection of IP rights, (2) patent protection, and (3) copyright piracy under the IP rights subindex.[14] The higher a country's IPRI's IP index, the stronger the IP protection. For our analysis, we calculated the variable "foreign IP risk" based on an average of the IPRI IP right score between the United States and offshore countries for the three years before each announcement date (i.e. U.S. average score minus offshore country average score over three years). Because the IPRI index is higher when a country has more vital IP protection, this measure is positive when foreign IP risk is higher (i.e. when the United States has stronger IP protection than its offshore location). When foreign IP risk is higher, reshoring can reduce IP risk.

4.6.3 Onshore Risk (iii): Reshoring Type (In-house, Insourced, or OTO)

As discussed in section 3, insourced reshoring strategy has a higher risk because it involves a significant change of strategy from outsourcing from a foreign supplier to in-house production in the United States. On the other hand, OTO reshoring strategy is likely to have low risk, because it does not require change in a firm's sourcing strategy or require major capital investments in new production facilities. We created two dummy variables to examine the respective impacts of insourced reshoring and OTO reshoring. Specifically, if the announcement is based on insourced reshoring, the dummy variable "insourced effect" equals 1, and otherwise equals 0. If the announcement is related to OTO reshoring, the dummy variable "OTO effect" equals 1, and equals 0 otherwise.

4.6.4 Onshore Risk (iv): Business Environment (Democratic- vs. Republican-led States)

[12] Property Rights Alliance is an affiliate of Americans for Tax Reform Foundation. They partner with 125 international organizations from 73 countries to conduct the IPRI index.
[13] This index has been commonly used to measure intellectual protection rights in the operations management literature (Skowronski and Benton 2018, Skowronski et al. 2020).
[14] There are three areas under IPRI: IP rights, legal and political rights, and physical property rights (Levy-Carciente and Montanari 2021). We focus on the IP rights index.

We measured whether states associated with reshoring announcements are Democratic- vs. Republican-led based on the controlling party of the reshoring state.[15] To capture the inshore risk of a less business-friendly environment in Democratic-led states, we create a variable, "Democratic-led states," that equals 1 if the state is under a Democrat governor and the Democratic party also controls the state legislature during the year of the reshoring announcement. If the state has a Democratic governor but Democrats do not control the legislature, or vice-versa (i.e. Democrats control the state legislature, but the state is not under a Democratic governor), we take this variable as 0. If a state is under a Republican governor and Republicans also control the state legislature, we code the variable as -1. This variable reflects the change from Republican control (-1) to divided government (0) and Democratic control (+1). This operationalization of partisan control is consistent with leading publications in the political and economic sciences (Alt and Lowry 1994, Poterba 1994, Halvorsen and Jakobsen 2013).

4.7 Control Factors

We incorporated the following control factors obtained from S&P's COMPUSTAT database, Bloomberg, and company annual reports to control other factors influencing abnormal stock returns associated with a firm's reshoring announcement. The control factors, including firm size, return on assets (ROA), and leverage, are computed based on the fiscal year ending prior to the announcement date, unless otherwise specified.

Firm size: We measured firm size according to the number of employees. Larger firms have more resources (e.g. financial resources, human capital) to return to the United States than smaller firms.

ROA: ROA is the ratio of a firm's operating income over its total assets adjusted by industry. Firms with higher profitability may have more resources to reshore.

Leverage: We measure leverage as a firm's debit-to-equity ratio. High leverage means a significant percentage of firm assets are in debt, indicating high operating risk (Johnson et al. 2017). High-leverage firms' reshoring initiatives may thus be perceived as riskier and lead to less favorable

[15] The controlling party of each state during each year is available at Ballotpedia (Ballotpedia 2020).

investor reactions.

Oil price volatility: Oil price volatility is the ratio of the oil price's daily standard deviation to the mean daily oil price in the month before the reshoring announcement. High oil price volatility may lead to more uncertain shipping and logistics costs and motivate firms to reshore (Ellram et al. 2013b, Chen and Hu 2017). We used the WTI Spot Price FOB (dollars per barrel) from Thomson Reuters.[16]

Labor intensity: We measured labor intensity as a firm's number of employees divided by total assets (Lo et al. 2013). It may be less favorable for labor-intensive firms to reshore due to high U.S. labor costs.

Offshore sales proportion: If a large proportion of a firm's sales come from an offshore country, it may be riskier and more costly to reshore. To measure offshore sales proportion, we obtained the ratio of a firm's annual sales in an offshore country or region to its total annual sales and averaged the ratios over two years, including the year of and the year before its reshoring announcement.

Offshore sales growth: A firm's sales growth in an offshore country may be affected when it moves back to the United States. Obtaining firm sales data from annual reports, we measured offshore sales growth as the average of a firm's annual sales growth in an offshore country or region over two years, including the year of and the year before its reshoring announcement.

Offshore GDP growth: An offshore country's GDP growth indicates its market potential, which may affect the attractiveness of reshoring to investors. For example, moving from an offshore country with high GDP growth back to the United States may increase reshoring firms' risks and costs to capture the offshore country's market potential, leading to less favorable investor reactions. With GDP data obtained from the World Bank, we measured offshore GDP growth as an offshore country's average percentage of GDP changes, including the year before and the year of reshoring announcement.

Nearshore 45 days announcements: Firms nearshoring their production and manufacturing to countries close to the United States, such as Canada and Mexico, may also lead to stock market

[16] WTI spot price FOB source:.

reactions. To control for this effect, we identified firms' nearshoring announcements from Factiva and coded "nearshore 45 days announcements" as 1 for firms having announcements of nearshoring to Canada and Mexico from 45 days before to 45 days after the firms' reshoring announcements and 0 otherwise.

Offshore 45 days announcements: We accounted for firms that offshored their manufacturing to countries beyond Canada and Mexico, because these offshoring initiatives may also affect the firms' market value. We identified firms' offshoring announcements from Factiva and coded "offshore 45 days announcements" as 1 for firms having announcements of offshoring to countries beyond Canada and Mexico from 45 days before to 45 days after the firms' reshoring announcements and 0 otherwise.

Manufacturing process: Investors may react differently to the reshoring of different manufacturing processes. For example, investors might react more positively when final assembly rather than raw material procedures are reshored to the United States. Based on the information provided in firms' reshoring announcements and annual reports, we coded the manufacturing process being reshored into raw material, assembly, and final manufacturing and then created two corresponding dummy variables: "manufacturing process: raw material dummy" and "manufacturing process: final manufacturing dummy").

Product recall: Product quality risk is a substantial concern when firms offshore their production (Steven et al. 2014). Therefore, firms with more product recalls may benefit more from reshoring. We searched the product recall databases maintained by the U.S. Consumer Product Safety Commission, U.S. Food and Drug Administration, and National Highway Traffic Safety Administration[17] to identify reshoring firms' product recalls. We measured product recall as a firm's total number of product recalls in three years before its reshoring announcement.

Top 10 states for business: Because the business competitiveness of a state may affect a reshoring firm's location decision, we created a dummy variable based on CNBC's Top 10 States for

[17] https://www.cpsc.gov/Recalls; https://www.fda.gov; https://www.nhtsa.gov

Business,[18] which reflects a state's overall competitiveness in various factors such as the economy, education, workforce, infrastructure, and quality of life. We coded the variable as 1 if the reshoring state is among the top 10 states for business in the announcement year and 0 otherwise.

Building new plants: Firms may decide to build new plants in the United States when reshoring, showing their commitment to and confidence in their reshoring decisions, which may lead to more favorable investor reactions. Based on the studied reshoring announcements, we coded "building new plant" as 1 for firms setting up new plants/offices in the United States and 0 otherwise.

Close facility: Firms may also show their commitment to and confidence in their reshoring decisions by closing production facilities or plants in the offshore locations after reshoring. To measure this variable, we looked at the facility of the specific country and location involved and determined whether the facility still existed (or if the number of facilities in this location were reduced) in the year following the reshoring year.[19] We took this variable as 1 if a firm closed its offshore facility subsequent to reshoring, and 0 otherwise.

Reshoring proportion: The extent of reshoring may also affect how investors react to a firm's reshoring announcement. Reshoring proportion is the ratio of the reshoring facility to the total number of offshore production facilities. From the annual report and the company website, we identified the total number of offshore plants and calculated the "reshoring proportion" variable by dividing the reshoring activity (taken as 1) by the number of offshore plants. A higher reshoring proportion means that the reshoring activity is a more significant action by the firm.[20]

Offshore locations: Investors may react differently when firms reshore from different offshore countries. To account for this potential heterogeneity, we created two offshore location dummies. One is "offshore China," indicating whether a firm reshores from China, the nation with the most factories, and the other is "offshore G7," indicating whether a firm reshores from the G7 countries (other than

[18] https://www.cnbc.com/americas-top-states-for-business/

[19] For example, if a firm had a facility in Portugal in the year of reshoring, and this facility no longer existed in its annual reports or the number of facilities in this location was reduced in the subsequent year, we assumed that the firm closed this facility.

[20] For example, a firm could have dozens of offshore production facilities in different countries, and the reshoring activity in the news would cover just a small portion of the firm's offshore locations. We expected that the impact of reshoring activity would be weaker for firms with many offshore locations.

the United States), which make up the world's largest advanced economies.

Operational capability: Firms with better operational capabilities may be more capable of handling complex reshoring processes, leading to more favorable investor reactions. Following the literature (Dutta et al. 2005, Lam et al. 2016a, Yiu et al. 2020), we employed stochastic frontier estimation methodology to quantify a firm's operational capability as its ability to transform operational resources (i.e. number of employees, cost of goods sold, capital expenditure) into operational output (i.e. operating income).

4.8. Endogeneity

In our research we investigate how a firm's reshoring announcement relates to its market value. However, a firm's reshoring decision is not random and may depend on other internal and external factors, leading to possible selection bias (Ketokivi and McIntosh 2017). Two examples, labor intensity (an internal factor) and oil price volatility (an external factor), illustrate this point. For example, labor-intensive firms may be less likely to reshore because they rely more on cheap and widely available labor in developing countries (Ellram et al. 2013a). By contrast, firms may be more likely to reshore when oil prices become more volatile because high oil price volatility induces more uncertainties in transportation and supply chain management, motivating firms to move production and manufacturing back to their home countries (Chen and Hu 2017).

We thus followed the literature (Shaver 1998, Wolfolds and Siegel 2019) by employing the Heckman model to address selection bias. The Heckman model adopts a two-stage approach (Heckman 1979), explicitly modeling the probability of an observation to be selected for the treatment group (the first-stage selection model) and the conditional expectation of the outcome resulting from the treatment (the second-stage outcome model). In our research context, the first-stage selection model concerns a firm's probability of reshoring, whereas the second-stage outcome model focuses on a firm's market-value change caused by reshoring. However, as Wolfolds and Siegel (2019) emphasized, if the variables determining the selection in the first-stage model also impact the outcome in the second-stage model, the exclusion restriction condition cannot be met, and the results based on the estimation approach become less reliable. For example, although labor intensity may determine a firm's reshoring decision, as discussed earlier, it may also affect the extent to which a firm's market

value will change because of reshoring. In particular, reshoring may negatively impact the market value of a labor-intensive firm because of the expected increase in labor costs after reshoring. Similarly, oil price volatility may not only motivate a firm to reshore but also enable the firm to benefit more from reshoring in terms of increased market value, because reshoring helps reduce uncertainties arising from oil price volatility and leads to more stable future cash flow for the firm.

Wolfolds and Siegel (2019) suggested it is essential to identify and include one or more variables or instruments that "affect selection but not the outcome" in the first-stage model to satisfy the exclusion restriction conditions and yield more reliable results. We used two such instruments in this research, one indicating the annual number of reshoring announcements in the industry and the other representing the Trump administration (2017–2020). A firm should be more likely to reshore if many of its industry peers reshore (Boffelli and Johansson 2020), but this factor is unlikely to affect its market value directly. Similarly, whereas the Trump administration motivated firms to return to the United States (Pegoraro et al. 2022), firms' market value was not necessarily higher during the Trump administration. We further confirmed that these two instruments are not significantly correlated with firms' market value ($p > 0.1$), satisfying the exclusion restriction condition.

As a result, our first-stage selection model includes the two instruments (annual industry reshoring announcement count and Trump administration), labor intensity, oil price volatility, and three firm-level variables (firm size, ROA, and leverage) that may be related to firms' reshoring decisions. In particular, whereas large and profitable firms may have more resources and capacities to support their reshoring activities (Zhang et al. 2023), high leverage may increase the risk of firms' strategic changes or initiatives, including reshoring (Mishra and Modi 2013).

We relied on a probit regression to estimate the first-stage selection model. Firms included in the estimation consist of reshoring firms (i.e. the event study sample firms) and their industry peers (with the same Global Industry Classification codes as the reshoring firms) that have offshore production but did not make any reshoring announcements in the studied period. As shown in Table 4, the probit regression results confirm our prediction: a firm was more likely to reshore when many of its industry peers reshored, during the Trump administration period, and when oil prices were volatile in the external environment. Internally, larger and less labor-intensive firms were more likely to

reshore.

Table 4. First-Stage Probit Regression Results

	Coef.	Standard Err.
Industry's reshoring number	0.0739**	0.0066
Trump administration	0.1871**	0.0583
Oil price volatility	0.9571*	0.4270
Firm size	0.0018**	0.0001
ROA	0.0001	0.0008
Leverage	0.0000	0.0017
Labor intensity	−34.7172**	8.4923

Notes: * $p < 0.05$; ** $p < 0.01$

Number of observations	27,618
Log-likelihood	−1098.560
LR chi2(7) = 309.4100	
Prob > chi2 = 0.0000	

After running the probit regression, we obtained an inverse Mills ratio (IMR) for each firm to account for its probability to reshore (King and Soule 2007). The IMR is added as an additional independent variable in the second-stage outcome model, as shown in the next paragraph. Consistent with the practice in Wolfolds and Siegel (2019), all variables from the first-stage selection model, except the two instrumental variables, are also included in the second-stage outcome model. We excluded the two instrumental variables because they were not expected to relate to market value (we confirmed this by the correlation check). Finally, we display the test results based on the traditional ordinary least squares model without IMR in Table 7 for direct comparison.

Second-stage outcome model: CAR_i = β0 + β1 firm size + β2 ROA + β3 leverage + β4 oil price volatility + β5 labor intensity + β6 offshore GDP growth + β7 offshore sales growth + β8 offshore sales proportion + β9 product recall + β10 offshore 45 days announcements + β11 nearshore 45 days announcements + β12 manufacturing process: raw material dummy + β13 manufacturing process: final manufacturing dummy + β14 top 10 states for business + β15 build new plant + β16 close facility + β17 reshoring proportion + β18 offshore China + β19 offshore G7 +β20 operational capability + β21 foreign currency risk + β22 foreign IP risk + β23 insourced effect + β24 OTO effect + β25 Democratic-led states + β26 IMR + $residual_i$ (3).

Table 5 presents the descriptive statistics and correlations of the variables.

Table 5: The Descriptive Statistics and Correlations of the Variables

		Mean	Standard Deviation	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
1	CAR	0.00	0.02																										
2	Firm size	144.83	371.07	0.02																									
3	ROA	1.55	1.49	0.14*	-0.02																								
4	Leverage	1.73	13.65	-0.02	-0.02	0.03																							
5	Oil price volatility	0.03	0.03	0.15*	-0.06	0.19**	-0.03																						
6	Labor intensity	0.00	0.00	-0.16**	0.36**	-0.18**	0.00	-0.04																					
7	Offshore GDP growth	0.04	0.05	-0.04	0.08	-0.03	-0.03	-0.03	0.10																				
8	Offshore sales growth	0.15	0.79	0.06	-0.02	0.00	0.00	0.02	-0.09	-0.04																			
9	Offshore sales proportion	0.24	0.16	0.01	-0.03	0.01	-0.05	0.03	-0.05	-.150*	-0.15*																		
10	Product recall	0.56	3.25	0.07	0.05	0.00	-0.02	0.00	-0.13*	0.04	0.08	-0.08																	
11	Offshore 45 days announcement	0.10	0.30	-0.01	0.01	0.02	0.04	-0.06	-0.17**	-0.04	0.22**	-0.10	0.18**																
12	Nearshore 45 days announcement	0.02	0.14	0.01	0.00	0.01	0.00	-0.02	-0.05	-0.05	-0.02	0.01	0.13*	-0.05															
13	Manufacturing process: raw material	0.10	0.30	0.10	-0.11	-0.06	-0.02	0.22**	-0.04	-0.08	-0.05	0.12*	-0.04	-0.11	-0.05														
14	Manufacturing process: final manufacturing	0.58	0.49	-0.02	0.22**	0.07	-0.08	-0.04	0.16**	0.15*	-0.10	-0.06	0.08	0.10	0.07	-0.39**													
15	Top 10 states for business	0.32	0.47	-0.02	-0.09	-0.07	0.00	-0.02	0.06	0.02	-0.08	0.16**	0.03	-0.16**	-0.05	0.10	0.03												
16	Build new plant	0.27	0.44	0.00	-0.13*	-0.07	0.01	-0.06	0.05	-0.10	0.00	-0.04	-0.02	-0.13*	-0.09	0.06	-0.17**	0.13*											
17	Close facility	0.11	0.31	0.01	-0.09	0.00	-0.01	-0.01	-0.09	-0.14*	-0.04	0.12*	-0.15*	-0.01	0.03	0.03	-0.09	0.05	-0.04										
18	Reshoring proportion	0.15	0.23	0.09	-0.18**	0.06	-0.01	0.05	0.19**	-0.04	-0.02	0.09	-0.14*	-0.13*	-0.03	0.07	-0.08	0.00	0.15*	0.12*									
19	Offshore China	0.49	0.50	-0.07	0.07	0.02	-0.12	-0.06	0.10	0.44**	-0.05	0.09	0.02	-0.05	0.00	-0.04	0.10	0.06	-0.01	-0.05	-0.05								
20	Offshore G7	0.19	0.34	0.07	-0.01	0.18**	0.12*	0.13*	-0.09	-0.33**	-0.02	0.02	-0.05	-0.08	0.00	0.11	-0.12*	-0.04	0.07	0.02	-0.05	-.035**							
21	Operational capability	0.66	0.14	0.00	0.01	0.14*	-0.01	0.02	-0.27**	-0.01	0.02	-0.17**	-0.04	0.11	0.00	-0.06	0.00	-0.22**	-0.04	-0.07	-0.22**	-0.05	0.03						
22	IMR	2.42	0.50	0.00	-0.81**	0.02	-0.05	0.06	-0.10	0.10	-0.03	0.03	-0.09	-0.03	-0.03	0.15*	-0.20**	0.14*	0.07	0.08	0.22**	-0.02	-0.05	-0.11					
23	Currency risk	0.02	0.01	0.10	0.04	-0.04	0.00	0.01	0.11	-0.27**	-0.08	-0.04	0.00	-0.04	0.04	-0.05	0.06	0.14*	0.09	0.08	0.02	0.02	0.03	-0.20**	-0.04				
24	IP risk	2.04	1.12	-0.01	0.01	-0.24**	-0.09	-0.13*	0.16**	0.33**	0.00	-0.05	0.04	0.00	0.05	-0.08	0.14*	-0.02	-0.16**	-0.12*	-0.06	0.33**	-0.63**	-0.14*	0.04	0.07			
25	Insourced effect	0.13	0.33	-0.19**	-0.06	-0.11	-0.01	-0.04	0.24**	0.04	-0.03	-0.12*	-0.05	-0.06	-0.06	-0.09	0.11	-0.04	0.17**	-0.07	0.17**	0.03	-0.106	0.04	0.09	0.04	0.07		
26	OTO effect	0.10	0.30	0.00	0.48**	-0.03	-0.03	0.08	0.23**	0.20**	-0.01	-0.11	-0.03	0.00	-0.05	-0.03	0.17**	0.02	-0.21**	-0.12*	-0.22**	0.20**	-0.12*	0.20**	-0.25**	-0.13*	0.02	-0.13*	
27	Democratic-led states	-0.45	0.73	-0.03	-0.15*	0.24**	-0.05	0.15**	-0.09	-0.06	-0.05	-0.07	0.07	0.02	-0.01	-0.04	-0.09	-0.23**	0.03	-0.06	0.08	0.00	0.06	0.13*	0.13*	0.06	-0.06	0.03	-0.03

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

5. Analysis and Results

5.1. Market Reaction toward Reshoring Announcements

We used three statistical tests commonly applied in short-term event studies, a *t*-test, a Wilcoxon Signed Ranks (WSR) test, and a binomial sign test, to investigate whether abnormal returns were associated with the 281 reshoring announcements. First, we examined the effects of the reshoring announcement on abnormal returns from Day −1 to Day 1. Table 6 shows abnormal returns for all announcements under the three-factor model. We could not find significant results for day −1, day 0, and day 1, or from day 0 to day 1. Therefore, our event study result based on the 281 reshoring announcements **does not support H0**. Our result differs from Brandon-Jones et al. (2017), who found significant positive results from 37 announcements[21], whereas we could not find significant results based on a much larger sample. We will provide further analysis and discussion in section 5.3.

Table 6. Abnormal Returns Associated with All Reshoring Announcements

Day	Day −1	Day 0	Day 1	Day 0 to 1
N	280	281	281	281
Mean abnormal returns	0.0006	0.0010	0.0000	0.0010
t-statistic	0.5910	1.1370	−0.0490	1.0130
Median abnormal return	−0.0010	0.0004	0.0002	−0.0003
Wilcoxon signed-rank *Z*-statistic	−0.0440	1.0630	0.0790	−0.9440
% positive abnormal returns	47.86%	52.67%	50.53%	49.47%
Binomial sign test *Z*-statistic	−0.6570	0.8350	0.1190	−0.1190

Notes: +$p < 0.10$; * $p < 0.05$; ** $p < 0.01$; Based on the Fama–French three-factor model.
^ Sample size on Day −1 equals 280 instead of 281 due to missing data on that day only.

5.2. Analysis of Four Risk Factors

We conducted a hierarchical linear regression analysis to test hypotheses H1–H4. We examined the impact of different reshoring risks on the market reaction associated with a firm's reshoring announcement. First, we developed a model to determine whether the four risk factors of (i) foreign currency risk; (ii) foreign IP risk; (iii) reshoring types (1) insourced reshoring vs. others and (2) OTO reshoring vs. others; and (iv) business environment (reshoring to Democratic vs. Republican-led States) moderate the abnormal stock market reaction toward reshoring. We also considered control and full models. In the control model, CAR_i from Day 0 to Day 1 is regressed against all control

[21] We obtained the sample from Brandon-Jones et al. (2017) and found that it had a higher proportion of in-house reshoring (Type 1) than the dataset for our study.

variables. The full model includes control variables and moderating factors represented by the second-stage outcome model in formula (3). The maximum variance inflation factor value across all independent variables included in the full model is 5.672, which is below the suggested threshold of 10 and indicates multicollinearity is not a major concern (Neter 1996). As a robustness check, we also included a full model without the IMR and obtained consistent test results.

Table 7. Regression Results for Event Period Days 0 to 1

	Control Model with IMR	**Full Model with IMR**	**Full Model without IMR**
	Unstandardized coefficients (standard error)	Unstandardized coefficients (standard error)	Unstandardized coefficients (standard error)
Intercept	-0.02(0.013)	-0.036(0.014)*	-0.018(0.009)*
Firm size	0.000(0.000)*	0.000(0.000)+	0.000(0.000)
ROA	0.001(0.001)	0.001(0.001)+	0.002(0.001)*
Leverage	0.000(0.000)	0.000(0.000)	0.000(0.000)
Oil price volatility	0.058(0.037)	0.064(0.037)+	0.059(0.037)
Labor intensity	-1.229(0.386)**	-1.164(0.387)**	-0.974(0.369)**
Offshore sales proportion	-0.003(0.028)	0.004(0.029)	0.019(0.028)
Offshore sales growth	0.001(0.001)	0.001(0.001)	0.001(0.001)
Offshore GDP growth	0.002(0.007)	0.003(0.007)	0.004(0.007)
Product recall	0.000(0.000)	0.000(0.000)	0.000(0.000)
Offshore 45 days announcements	-0.002(0.004)	-0.002(0.004)	-0.002(0.004)
Nearshore 45 days announcements	0.000(0.007)	-0.002(0.007)	-0.002(0.007)
Manufacturing process: raw material	0.006(0.004)	0.005(0.004)	0.005(0.004)
Manufacturing process: final manufacturing	0.002(0.002)	0.002(0.002)	0.001(0.002)
Top 10 states for business	-0.001(0.002)	-0.003(0.002)	-0.002(0.002)
Build new plant	0.001(0.002)	0.002(0.003)	0.002(0.003)
Close facility	0.002(0.004)	0.002(0.004)	0.002(0.004)
Reshoring proportion	0.010(0.005)+	0.013(0.005)**	0.013(0.005)**
Offshore China	-0.001(0.002)	-0.002(0.003)	-0.003(0.002)
Offshore G7	0.002(0.004)	0.006(0.004)	0.005(0.004)
Operating capability	-0.001(0.008)	0.006(0.009)	0.004(0.009)
IMR	0.007(0.004)	0.007(0.004)	
H1: Foreign currency risk		0.164(0.090)*	0.178(0.09)*
H2: Foreign IP risk		0.002(0.001)*	0.002(0.001)*
H3a insourced effect		-0.008(0.003)*	-0.008(0.003)*
H3b OTO effect		0.002(0.004)	0.004(0.004)
H4: Democratic-led States		-0.003(0.002)*	-0.003(0.002)*

N	272	272	272
R square	0.117	0.174	0.166
AR square	0.043	0.087	0.081
F	1.576	1.990	1.956
Sig	0.055+	0.004**	0.005**

Notes: +$p < 0.10$; * $p < 0.05$; ** $p < 0.01$ (two-tailed tests for control factors and one-tailed tests for hypothesized predictors); CARs are based on the Fama–French three-factor model. Standard errors are indicated in parentheses; the final sample size for regression analysis is 272 (rather than 281) because some data for "reshoring proportion" are missing (specifically, we could not identify the number of offshore factories for nine firms).

Table 7 presents the results of the hierarchical linear regression analysis.[22] Based on our analysis of the full model as defined in Formula (3) and stated in section 4.8,[23] we found a more positive market reaction for a firm's reshoring under higher currency volatility risk and higher foreign IP risk in offshore countries ($p < 0.05$). Hence, the results suggest that foreign currency and IP risk significantly affect CAR; thus, **H1 and H2 are supported**. Next, as explained earlier, a Type (2) insourced reshoring strategy can be riskier than others in general. The coefficient of insourced reshoring is negatively significant ($p < 0.05$), **supporting H3a**. However, we did not see a positive significant effect of OTO reshoring ($p > 0.1$) as we had hypothesized, so **H3b is not supported**. Finally, reshoring to Democratic-led states is also negatively significant ($p < 0.05$). This result implies that, compared to Republican-led states, there is a more negative stock market reaction when a company reshores to Democratic-led states. Hence, **H4 is supported**.

In summary, the market reacts more negatively toward reshoring announcements that entail Type (2) insourced reshoring strategies and/or reshoring announcements involving Democratic-led states. The market responds more positively when firms reshore from offshore countries with higher currency volatility relative to the U.S. dollar and from offshore countries with lower IP protection scores than the United States (i.e. a higher foreign IP risk). Note that the finding of a more positive market reaction for reshoring under high currency volatility and high foreign IP risk aligns with

[22] For the overfitting issue, we adopted backward regression and excluded the eight least relevant control factors, reducing the total number of regression parameters from 26 to 18 and the events per variable to a more robust level of 15 (i.e. 272/18 = 15). The four explanatory factors remain significant, and the control factors remain very similar, alleviating the concern of overfitting.

[23] Our regression model is significant, with an *F*-value of 1.990 for the full model. The adjusted *R*-squared is 0.087, which is acceptable because our regression is based on cross-sectional data (Klassen and McLaughlin, 1996).

previous literature (Gray et al. 2013, Tate et al. 2014, Fratocchi et al. 2016, Vanchan et al. 2018). These risks increase costs from transactions, operations, and supply chain coordination for offshore facilities, motivating firms to reshore.

When a firm returns to the United States, the market expects the firm to create more job opportunities. However, if products or components were previously outsourced, the firm may not have related expertise or experience regarding specific products. Lack of available highly skilled labor and technical know-how would impose risks, and the firm would have to redesign production processes from scratch. We do not find a more significant positive market reaction to OTO reshoring, probably because OTO involves mainly the change of supplier location but not onshore production setup, which is perceived as a less significant strategic move compared to in-house-to-in-house reshoring. Compared to Democratic-led states, Republican-led states generally provide a more business-friendly environment for reshoring firms, increasing their chance of success and leading to more positive market reactions.

Among the control factors, oil price volatility is positively significant ($p < 0.1$), whereas labor intensity is negatively significant ($p < 0.05$). Like foreign currency volatility, oil price volatility typically leads to uncertainty in logistics and total costs (Tate 2014, Ashby 2016, Gharleghi et al. 2020). Returning to the firm's home country might decrease the uncertainty of logistics costs caused by oil price volatility, which leads to a more positive market reaction. At the same time, high labor intensity of a firm means a high labor cost when the firm's production returns to the United States. The high labor cost and the challenge of recruiting skilled laborers could also lead to adverse market reactions (Collins 2022). The effect of reshoring proportion is also positively significant ($p < 0.01$). A higher proportion of reshoring reflects the significance of the reshoring activity to the firm.

We further explored potential interaction effects[24] among the four risk factors. Specifically, we explored whether the two offshore risks (foreign currency risk and foreign IP risk) interact to cause higher risks and whether the two onshore risks (insourced reshoring and Democratic-led states) interact to discourage firms from reshoring back to the United States. The results in Table 8 show an

[24] We thank an anonymous reviewer for suggesting that we further explore possible interaction effects.

insignificant interactive effect between foreign currency risk and IP risk ($p > 0.1$) but a significantly negative interactive effect between insourced reshoring and Democratic-led states ($p < 0.1$), indicating that setting up (or expanding) new production facilities in Democratic-led states without prior in-house production experience or expertise creates additional difficulties. There is no significant interactive effect between the variables for OTO reshoring and Democratic-led states.

Table 8. Exploring Interaction Effect

	Unstandardized coefficients (standard error)
Intercept	-0.032(0.014)*
Control variables	included
H1: Foreign currency risk	0.152(0.091)*
H2: Foreign IP risk	0.003(0.001)*
H3a: Insourced effect	-0.008(0.003)*
H3b: OTO effect	0.003(0.005)
H4 Democratic-led States	-0.003(0.002)*
Foreign IP risk * Foreign currency risk (H2 * H1)	0.047(0.070)
Insourced effect * Democratic-led States (H3a * H4)	-0.007(0.005)+
OTO effect * Democratic-led States (H3b * H4)	-0.004(0.005)
N	272
R square	0.183
AR square	0.085
F	1.872
Sig	0.006**

Remarks: +p < 0.10; * p < 0.05; ** p < 0.01 (one-tailed tests for postulated predictors); CARs are based on the Fama–French three-factor model. The standard errors are indicated in parentheses, and control variables are included. The final sample size for regression analysis is 272 (rather than 281) because some data for "reshoring proportion" are missing (i.e. we could not identify the number of offshore factories for nine firms).

5.3. Market Reactions toward Different Types of Reshoring Strategies

Our results in Table 7 indicate that the market reacts more positively toward Type (1), in-house reshoring. This observation motivated us to further investigate the absolute (rather than relative) market reactions toward different types of reshoring announcements. Of the 281 reshoring announcements included in our study, 216 (76.87%) are in-house reshoring, whereas 36 (12.81%) are insourced reshoring and 29 (10.32%) are OTO reshoring. Table 9 reports the market reaction to these

three types of reshoring announcements. Reshoring announcements based on Type (1), in-house reshoring, resulted in a positive market reaction on Day 0, and Day 0 to 1. The mean (median) abnormal return for Day 0 to 1 is 0.26% (0.16%) and positively significant ($p < 0.05$ for both mean and median). However, reshoring announcements based on Type (2), insourced reshoring, resulted in a negative market reaction on Day 0, and Day 0 to 1. The mean (median) abnormal return is −0.79% (−0.73%) and negatively significant ($p < 0.01$ for both mean and median). We could not find significant results for Type (4), OTO reshoring ($p > 0.1$ for all tests). The test results for these three types of reshoring announcements remain consistent when the market model and the four-factor model (instead of the three-factor model) are used to estimate the stock market reactions, as shown in Tables A.5 and A.6 in the Appendix.

Table 9. Abnormal Returns Associated with In-house, Insourced, and OTO Reshoring

						Placebo test			
	Day	**Day −1**	**Day 0**	**Day 1**	**Day 0 to 1**	**Day −1**	**Day 0**	**Day 1**	**Day 0 to 1**
Type (1), in-house reshoring	*N*	215	216	216	216	216	216	216	216
	Mean abnormal returns	0.0002	0.0020	0.0006	0.0026	0.0008	−0.0010	0.0009	−0.0001
	t-statistic	0.1500	1.9010*	0.5910	2.1490*	0.7983	−0.7510	0.8196	−0.0396
	Median abnormal return	−0.0011	0.0011	0.0006	0.0016	−0.0005	0.0006	−0.0005	−0.0008
	WSR *Z*-statistic	−0.2860	1.7010*	0.5430	1.9840*	−0.185	0.0980	−0.0950	−0.3300
	% positive abnormal returns	47.44%	54.17%	51.85%	52.78%	46.30%	52.32%	48.15%	47.22%
	Binomial sign test *Z*-statistic	−0.6820	1.1570	0.4760	0.7480	−1.0206	0.6124	−0.4763	−0.6152
Type (2), insourced reshoring	*N*	36	36	36	36	36	36	36	36
	Mean abnormal returns	0.0007	−0.0056	−0.0032	−0.0079	0.0001	−0.0002	0.0026	0.0025
	t-statistic	0.2220	−2.3770**	−1.1170	−2.8400**	0.0431	−0.0359	0.6061	0.3184
	Median abnormal return	−0.0002	−0.0029	0.0004	−0.0073	−0.0009	0.0012	−0.0015	−0.0002
	WSR *Z*-statistic	−0.0390	−1.9870*	0.8960	−2.7420**	−0.8330	0.5030	−0.3600	0.0000
	% positive abnormal returns	50.00%	38.89%	52.78%	33.33%	47.22%	52.78%	41.67%	50.00%
	Binomial sign test *Z*-statistic	0.0000	−1.1670	0.1670	−1.8330*	−0.1667	0.1667	−0.6761	0.0000
Type (4), OTO reshoring	*N*	29	29	29	29	29	29	29	29
	Mean abnormal returns	0.0034	0.0020	−0.0011	0.0009	0.0040	0.0075	−0.0165	−0.0090
	t-statistic	1.2750	1.1350	−0.6640	0.3840	0.5164	0.6965	−1.2599	−0.6141
	Median abnormal return	−0.0008	0.0006	−0.0031	−0.0025	−0.0012	−0.0021	−0.0016	−0.0057
	WSR *Z*-statistic	−0.7890	1.1140	−1.1570	−0.4000	−0.3350	−0.3780	−1.1570	−1.2110
	% positive abnormal returns	48.28%	58.62%	37.93%	44.83%	41.38%	41.38%	44.83%	37.93%
	Binomial sign test *Z*-statistic	0.0000	0.7430	−1.1140	−0.3710	−0.74278	−0.7428	−0.3714	−1.1142

Notes: * $p < 0.05$; ** $p < 0.01$; Based on the Fama–French three-factor model.

To further corroborate our results, we randomly selected firms without reshoring announcements from the same industry for placebo tests. The results are also presented in Table 9. The nonsignificant results of the placebo tests suggest that other factors, such as general economic conditions, are unlikely to drive the abnormal stock returns documented in our study.

Reshoring involves bringing previously offshore production activities back home, regardless of the governance mode of the earlier offshored activities overseas (insourced or outsourced) (Barbieri et al. 2018). Yet we find that investors react negatively when reshoring and insourcing are carried out simultaneously. Bals et al. (2016) suggested that a change from offshore-outsource to domestic-in-house (i.e. insourced reshoring) is "the most drastic two-dimensional movement" (p. 109). As supported by some recent case research, combined reshoring and insourcing decisions are more often associated with fluctuating costs, quality problems, and capacity constraints, suggesting that such reshoring initiatives are more risky and often require more time (sometimes multiple years) to complete (Barbieri et al. 2022). Rather than a one-shot shift from "buy" to "make," research suggests that changes in governance mode should evolve slowly alongside strategic relocation (Barbieri et al. 2022, Chen et al. 2022).

Our research suggests no simple direct relationship between reshoring initiatives and market reactions, as shown in Table 6. Instead, researchers should consider various offshore risks and inshore risks to reveal the full effect of reshoring.

6. Implications and Conclusion

6.1. Implications for Multinational Enterprises (MNEs)

Our empirical findings based on a sample of 281 reshoring announcements from 2009 to 2022 suggest that different types of reshoring strategy with the consideration of the four risk factors can create different market reactions. First, our research implies that business environments (e.g. Republican-led states that tend to be more business-friendly) can play a significant role in the investors' reaction toward reshoring announcements. Because the business environment can make a difference in the investor's reaction, a clear understanding of state government policies and regulations in the onshore location appears to be critical to reshoring success.

Our results show that the market reacts negatively when firms move previously outsourced operations to new in-house production facilities in the United States, probably due to the fundamental strategic shift from "buy" to "make." Because this reshoring strategy requires new infrastructure and expertise, companies may find it more expensive and time-consuming than expected. Moving operations is not a fast or simple process (Mann 2014, U.S. Department of Commerce 2019), and businesses undergoing reshoring should be cautious regarding process changes to their sourcing strategies, manufacturing setups, production expertise, and workforce requirements. For example, the complexity of insourced reshoring may increase uncertainty and concern investors. Our results on the market reaction further show that the risk associated with insourced reshoring worsens with a lack of government support, as reflected by the negative interactive effect (Table 8) between insourced reshoring and business environments in Democrat-led states.

We found empirical evidence that the market value of firms increases significantly when firms reshore from a country with lower IP protections to the United States. Because the United States has stronger IP protections than most developing countries (Davidson 2010), reshoring certain innovative processes and production back to the United States can reduce IP risk, protect a firm's intangible IP assets, and improve investor confidence.

Our results reveal that currency fluctuation is another key market concern for MNEs that source from countries with high currency risks. Reshoring from high currency fluctuating regions back to the United States provides confidence to investors on the stability and predictability of firm operations. Firms with offshore operations should seek to reduce their exposure to currency risks by moving away from currency uncertain regions, and manufacturers should not make decisions on offshore investments simply based on the current cost of operations, but also take the long-term stability of foreign currency into consideration.

6.2. Implications for Policymakers

Our findings provide significant implications to policymakers. Most obviously, we find that state government support (through regulations and incentives) of the reshoring location can affect market reactions to reshoring initiatives. Indeed, our result is consistent with a common belief. According to Reshoring Initiative data, the most frequent factor reported for reasons of reshoring by returned

companies is government incentive and support (e.g., state grants and support to workforce training) provided to manufacturers (Moser, 2022). Therefore, state government policies can play an important role to foster more successful reshoring initiatives.

Our results also highlight the stock market's perception of the potential difficulty of insourced reshoring. Firms that previously outsourced operations overseas may find it particularly difficult to bring those operations back to the United States. Setting up manufacturing facilities in the United States is challenging, and firms often encounter many difficulties. Some firms may find it difficult to find skilled labor, whereas others may have trouble complying with environmental regulations. Again, government can support firms to reshore by cutting red tape to make reshoring more palatable.

Our results show that investors recognize the value of IP protection and currency stability in the United States. By improving IP protection laws and developing instruments to ensure the stability of the U.S. dollars, the U.S. government can make the country an attractive location for firms to reshore their operations more successfully.

6.3. Limitations and Future Opportunities

We identify a few limitations of this study and make some suggestions for future research. Although we provide possible explanations for our research hypotheses, our study is not designed to provide causal identification of these arguments. We collected announcement data from the Reshoring Initiative and relied on this database to identify reshoring news. Although this platform provides a comprehensive database of U.S. reshoring news, some reshoring announcements may be missing. In our study we focus primarily on publicly traded MNEs; future researchers could also examine small and medium-sized manufacturers, as well as private companies, which could enhance the generalizability of the findings. Furthermore, some factors, such as political risks of the offshore country and the capability of the senior management team to carry out reshoring, have not been explored in this study. In future research, we may evaluate the economic factors of reshoring and their impacts on the social community's matrix (e.g. employment rate, living standard). These factors can be critical in reshoring implementation, and research on them could provide valuable information for policymakers.

In this study we explored how different reshoring risks are potentially related to the market reaction to reshoring announcements. Our findings provide insights for senior management to evaluate different reshoring options. When firms reshore from offshore countries with high foreign currency and IP risks, applying in-house reshoring strategies to a Republican-led state, they are likely to obtain better performance (as measured by abnormal stock returns). Overall, our findings provide information useful to both firms and policymakers. When MNEs reshore, they should not underestimate the impact of different reshoring strategies and locations when making reshoring decisions. For policymakers, our regression analysis provides evidence that state governments play an essential role in facilitating reshoring. Republican-led states may provide more business-friendly policies and favorable regulatory environments, strengthening positive market reactions. This finding also suggests that offshore countries should maintain an attractive business environment and a stable currency and protect foreign investors' IP rights to entice firms to stay.

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Appendix

Figure A.1. Number of Reshoring Announcements

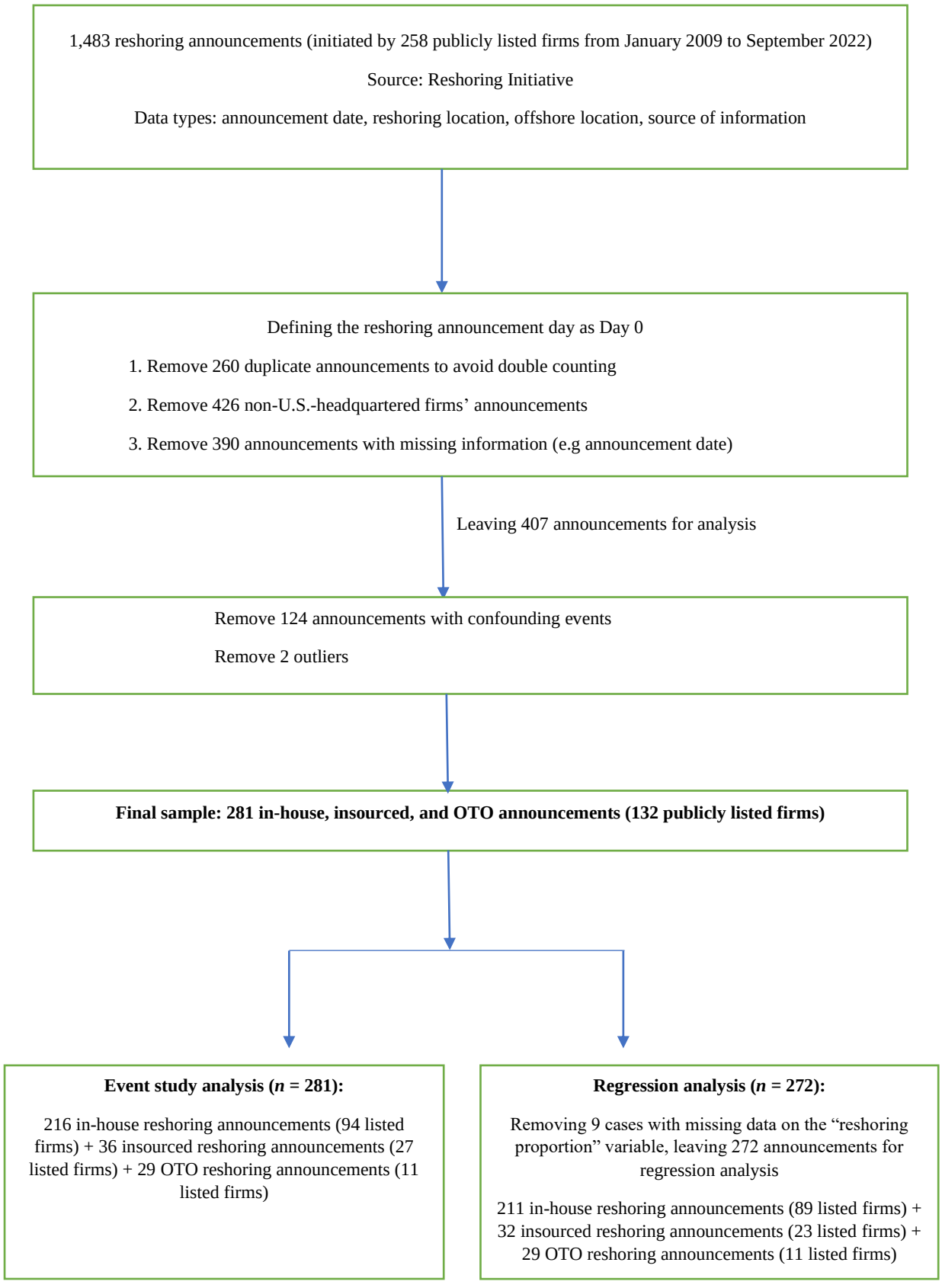

Table A.2. Number of Reshoring Announcements per Year

Year	Number of Reshoring Announcements
2009	3
2010	10
2011	10
2012	21
2013	39
2014	16
2015	17
2016	9
2017	18
2018	15
2019	38
2020	32
2021	34
2022*	19
Total	281

** up to September 2022.*

Figure A.3. Word Cloud Indicating the Frequency of 67,418 Words in 149 Documents

Appendix A.4a. Procedure for Classifying of Reshoring Types

First, we recruited two external coders to code the 281 reshoring announcements independently. They were provided with the study purpose, classification definitions with coding training, detailed examples and guidelines, and a codebook, as shown in Appendix A.4. There were two rounds of coding. In round 1, the coders were asked to independently code all the reshoring announcements. There was approximately 72.24% agreement (203 out of 281 cases) on the coding results in the first round. Round 2 had 2 parts: in part 1, the coders were required to review the 78 (281−203) disagreement cases independently, following the same procedures as round 1, leading to agreement on 31 cases. In part 2, for the remaining 47 (78−31) cases, each coder was allowed to review the information (e.g. location, ownership) collected by their counterpart and discuss the remaining cases in detail. The main reason for disagreement was a lack of clear information or different interpretations of the announcements. After the second part of round 2, the coders achieved 100% agreement on the classification of the 281 reshoring announcements.

Appendix A.4b. Classifications of Reshoring Types

Introduction

Researchers followed the following steps to classify reshoring types from reshoring announcements. First, researchers read the original announcements and searched for additional supporting information (such as from annual reports and company websites). Researchers were then required to identify the location and ownership in offshore and reshoring locations onshore. Finally, researchers needed to determine the reshoring type following the subsequent definitions.

Definitions of Reshoring Types

Reshoring decisions can be classified according to four strategies:

1. *In-house-to-in-house reshoring* (hereafter *in-house reshoring*): the original offshored operations were performed **in-house**, and the reshored operations will also be performed **in-house** (Type 1).
2. *Outsourcing-to-in-house reshoring* (hereafter *insourced reshoring*): the original offshored operations were **outsourced** to foreign suppliers, but the reshored operations will be performed **in-house** (Type 2).
3. *In-house-to-outsourcing reshoring*: the original offshored operations were performed **in-house**, but the reshored operations will be **outsourced** to domestic suppliers (Type 3).
4. *OTO reshoring*: the original offshored operations were **outsourced**, and the reshored operations will also be outsourced (Type 4).

Examples for each reshoring type are as follows:

1. Type (1) In-house reshoring

On October 29, 2014, General Motors (GM) released the headline "GM to move production of Volt part to US" on AP News (AP News 2014). The article identifies the offshore location in Mexico and the reshoring location in Detroit, saying that General Motors "moved the Chevrolet Volt's electric drive unit from **Mexico to a Detroit factory**." The article also stated that GM would have an in-house production facility in the United States: "moving the electric drive from Ramo Arzipe, Mexico to Warren Michigan transmission plants." Because we could not identify the offshore location of Mexico's operation belonging to General Motors, we searched Ramo Arzipe with the company name and found that the operation in Mexico is owned by General Motors.[25] Therefore, we indicate this case as Type (1) in-house reshoring.

2. Type (2) Insourced reshoring

Williams-Sonoma stated on June 4, 2019, "Williams-Sonoma will halve **China sourcing** in the next year" in *Supply Chain Dive* (Cosgrove 2019). In the article, the CEO from William-Sonoma advises that "Williams-Sonoma will halve the amount of goods it sources from China today by 2020 and . . . [**expand] its U.S. manufacturing operation** by hiring 500 additional workers for its Tupelo, **MS, factories**." Here, the offshore location is China with outsourced ownership, and the reshoring location is Mississippi with in-house ownership. Consequently, we might suggest that this is a case of Type (2) insourced reshoring.

3. Type (3) In-house-to-outsourcing reshoring (hypothetical example)

Company A made a reshoring announcement on May 10, 2020. The company has a **production plant in China** for its furniture orders. However, due to Trump's high tariff, Company A decided to reduce its dependence on Chinese manufacturing over the next few years and return to the United States. When it returned to the United States, it decided to **source from a supplier** with its production in **Colorado**. In this case, the offshore location is China and ownership is in-house, while the reshoring location is Colorado and ownership is outsourced. This could be considered Type (3) in-house-to-outsourcing reshoring.

4. Type (4) OTO reshoring

The November 3, 2016 article "Global Manufacturer Goes the Extra Mile to Reshore" in *Quality Magazine* (*Quality Magazine* 2016) stated that "Ametek, a global electronics manufacturer, decided to contact Engineering Specialties Inc. (ESI) after **outsourcing its metal stamping operations to Mexico**." The offshore location is Mexico and Ametek was outsourcing the stamping operation at that facility. The article continues, "After continuing to experience problems with the new supplier in Mexico, Ametek decided to **reshore their manufacturing back to ESI** . . . . ESI was able to meet all

[25] https://gmauthority.com/blog/gm/gm-facilities/gm-mexico-facilities/gm-ramos-arizpe-plant/.

the client's needs while also reshoring two jobs at its **Connecticut facility**." When Ametek returned to the United States, it contacted the company ESI for production, a supplier that had previously worked with Ametek before it offshored the production to Mexico. Therefore, we can conclude the reshoring location is in Connecticut and Ametek is outsourcing to a third-party supplier, ESI, in the United States. This is likely to be Type (4) OTO reshoring.

Coding Procedures:

Every sample requires two rounds of coding. In round 1, independent coders work on the dataset and code separately, following the subsequent procedures. In round 2, coders repeat the procedures in round 1, then both coders review the information collected by each other and discuss the information validity (Kuk 2006).

Round 1 Procedures:

Step 1: Read the reshoring announcement.

There are a total of 281 announcement links in the dataset. Please review the announcement and identify the offshore and reshoring location and ownership. If you can find all the information in the announcement, please specify the reshoring type based on the offshore and reshoring ownership, complete the following table, and retain the information. If you cannot determine the required information, please go to Step 2.

Step 2: Go specifically to the company websites.

Usually, the announcement is related to the reshoring decisions of the companies. Therefore, the independent coder can identify the reshoring location and ownership in the article. However, for some information, like offshore location or ownership, that cannot be found in the announcement, you can go to the company website to search for the "global operations" section and company news, which provide additional information. Please specify the reshoring type based on the offshore and reshoring ownership, complete the following table, and retain the information. If you cannot determine the required information, please go to Step 3.

Step 3: Search for information in annual reports

If you cannot find the information on the company website, you can check with the annual report 10K from the U.S. Securities and Exchange Commission website, sec.gov. Keywords such as "global operations," "sourcing," and "properties" can be used to search annual reports. Please specify the reshoring type based on the offshore and reshoring ownership, complete the following table, and retain the information. If you cannot determine the required information, please go to Step 4.

Step 4: Research from open internet sources

If you cannot find the information from the company website and annual report, you can search from open internet sources such as Yahoo News and Google. These search engines often archive information published in local magazines that might provide the required reshoring information. Please specify the reshoring type based on the offshore and reshoring ownership, complete the following table, and retain the information.

Round 2 Procedures:

After finishing Steps 1–4 in round 1, the research team will review the coding from coders. Round 2 procedures include two parts. In part 1, the coders were required to review the disagreement cases independently, following the same procedures as round 1.

Part 1

Repeat procedures 1–4 from round 1.

Part 2

Step 5: Review the information provided by another coder for the decisions.

Review the information from another coder to finalize the coding. Then, please specify the reshoring type based on the offshore and reshoring ownership, complete the following table, and retain the information.

Step 6: Meet and discuss all information and/or search for new information.

Each coder will describe the information (e.g. location, ownership) they have collected and explain their reasoning for the decision on the reshoring type to another coder. After reviewing the information and the explanation, independently search for additional information and complete the following table.

Case No.	Company	Year	Offshore location	Offshore ownership	Reshoring location	Reshoring ownership	Reshoring types	Remarks
1	General Motors	2014	Mexico	In-house	Detroit	In-house	1	https://gmauthority.com/blog/gm/gm-facilities/gm-mexico-facilities/gm-ramos-arizpe-plant/
2	Williams-Sonoma	2019	China	Outsourced	Mississippi	In-house	2	https://www.supplychaindive.com/news/williams-sonoma-half-china-sourcing-tariffs/556129/
3								
4								
…								
…								
281								

Table A.5. Abnormal Returns Associated with All Reshoring, In-House, Insourced, and OTO Reshoring[26] (Market Model)

	Day	Day −1	Day 0	Day 1	Day 0 to 1
All announcements	*N*	281	281	281	281
	Mean abnormal returns	0.0003	0.0005	0.0005	0.0010
	t-statistic	0.3430	0.5440	0.5230	0.8960
	Median abnormal return	−0.0006	0.0002	0.0011	0.0015
	WSR *Z*-statistic	−0.2190	0.5040	0.8370	1.2750
	% positive abnormal returns	46.62%	50.89%	52.67%	53.03%
	Binomial sign test *Z*-statistic	−1.0740	0.3590	1.0200	1.0160
Type (1), In-house reshoring	*N*	215	216	216	216
	Mean abnormal returns	0.0002	0.0020	0.0008	0.0028
	t-statistic	0.2230	1.7900*	0.7140	2.1470*
	Median abnormal return	−0.0004	0.0008	0.0012	0.0029
	WSR *Z*-statistic	−0.0130	1.4990+	1.0810	2.2980*
	% positive abnormal returns	47.69%	52.78%	53.24%	56.02%
	Binomial sign test *Z*-statistic	−0.6120	0.8180	1.0250	1.7730*
Type (2), insourced reshoring	*N*	36	36	36	36
	Mean abnormal returns	−0.0006	−0.0082	−0.0015	−0.0097
	t-statistic	−0.1700	−3.0170**	−0.5290	−2.6350**
	Median abnormal return	−0.0002	−0.0053	0.0014	−0.0070
	WSR *Z*-statistic	−0.3460	−2.6450**	0.3930	−2.5450**
	% positive abnormal returns	44.44%	34.29%	55.56%	36.11%
	Binomial sign test *Z*-statistic	−0.5000	−1.6900*	0.5000	−1.5000+
Type (4), OTO reshoring	*N*	29	29	29	29
	Mean abnormal returns	0.0023	0.0006	0.0008	0.0014
	t-statistic	0.6600	0.2720	0.4080	0.7240
	Median abnormal return	−0.0017	0.0010	−0.0013	0.0005
	WSR *Z*-statistic	−0.1840	0.5730	−0.2050	0.6050
	% positive abnormal returns	41.38%	58.62%	44.83%	51.72%
	Binomial sign test *Z*-statistic	−0.7430	0.7430	−0.1890	0.0000

Notes: +$p < 0.10$; * $p < 0.05$; ** $p < 0.01$

[26] We found a significant result for the *t* test and WSR test with respect to both in-house and insourced reshoring for Day 0 to Day 1 in the market model and four-factor model. In Tables A.5 and A.6, we also find that there are insignificant stock returns associated with all reshoring announcements in both the market model and four-factor model for Day 0 to Day 1. Then we divide our 281 reshoring announcements into three subsamples. Tables A.5 and A.6 report the market reaction to these three groups of reshoring announcements. In-house/insourced reshoring (in both the market model and four-factor model) shows significant abnormal stock price change for Day 0 and Day 0 to Day 1. The results are similar to what we found in the three-factor model.

Table A.6. Abnormal Returns Associated with All Reshoring, In-House, Insourced, and OTO Reshoring (Four-Factor Model)

	Day	Day −1	Day 0	Day 1	Day 0 to 1
All announcements	*N*	280	281	281	281
	Mean abnormal returns	0.0007	0.0005	0.0003	0.0007
	t-statistic	0.6530	0.4990	0.2920	0.7010
	Median abnormal return	−0.0004	0.0002	0.0006	0.0006
	WSR *Z*-statistic	−0.1120	0.3130	0.3230	0.7570
	% positive abnormal returns	48.57%	50.36%	50.53%	50.89%
	Binomial sign test *Z*-statistic	−0.3590	0.0600	0.1190	0.2390
Type (1), In-house reshoring	*N*	215	216	216	216
	Mean abnormal returns	0.0002	0.0017	0.0005	0.0022
	t-statistic	0.1850	1.521+	0.4450	1.74*
	Median abnormal return	−0.0004	0.0012	0.0000	0.0018
	WSR *Z*-statistic	−0.2550	1.264	0.5080	1.781*
	% positive abnormal returns	47.91%	52.56%	50.00%	54.17%
	Binomial sign test *Z*-statistic	−0.4790	0.6820	0.0000	1.1570
Type (2), insourced reshoring	*N*	36	36	36	36
	Mean abnormal returns	0.0010	−0.0070	−0.0009	−0.0079
	t-statistic	0.3050	−3.1550**	−0.3220	−2.9130**
	Median abnormal return	−0.0004	−0.0039	0.0010	−0.0067
	WSR *Z*-statistic	−0.0160	−2.5220**	0.0630	−2.7970**
	% positive abnormal returns	50.00%	36.11%	58.33%	33.33%
	Binomial sign test *Z*-statistic	0.0000	−1.5000+	0.8330	−1.8330*
Type (4), OTO reshoring	*N*	29	29	29	29
	Mean abnormal returns	0.0036	0.0008	0.0001	0.0010
	t-statistic	1.0330	0.4570	0.0660	0.4620
	Median abnormal return	0.0008	0.0011	−0.0007	−0.0001
	WSR *Z*-statistic	0.4870	0.6490	−0.6600	−0.3780
	% positive abnormal returns	51.72%	51.72%	44.83%	48.28%
	Binomial sign test *Z*-statistic	0.0000	0.0000	−0.3710	0.0000

Notes: +$p < 0.10$; * $p < 0.05$; ** $p < 0.01$