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Do foreign investments increase firm value and firm performance? Evidence from Japan

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ABSTRACT

As empirical evidence on the impact of internationalization on firm performance remains unclear, we revisit the question of whether foreign investments enhance firm value and firm performance. Using a panel sample of publicly listed firms in Japan during the 1990–2016 period, we find that foreign investments are negatively associated with firm value. In addition, foreign investments are negatively related to firm performance at short- and long-horizons. Furthermore, foreign investments appear to reduce revenue growth but have no effect on firm efficiency, suggesting that simply increasing foreign investments does not necessarily enhance revenue growth or firm efficiency.

1. Introduction

Studies on consequences of a firm's internationalization can be found in several business disciplines such as strategy, finance, and international business (see e.g., Gomes and Ramaswamy, 1999; Kotabe et al., 2002; Doidge et al., 2004; Fauver et al., 2004; Mani et al. 2007; Hsu et al., 2013). One of key questions in the literature is whether a firm's internationalization enhances or weakens its performance (see e.g., Buckley and Casson, 1976; Kogut and Zander, 1993; Zaheer, 1995; Hsu et al., 2013; Zhou and Wu, 2014). Generally speaking, empirical findings observed in the literature are mixed; that is, prior studies show that the relationship between a firm's internationalization and its performance is positive (see e.g., Hsu et al., 2013; de Jong and van Houten, 2014), negative (see e.g., Singla and George, 2013; Xiao et al., 2013) or not evident (see e.g., Doukas and Lang, 2003; Cosset et al., 2016). In this paper, we revisit the question of whether internationalization is associated with firm value and firm performance in an advanced economy.

Building upon prior studies (see e.g., Grossman and Helpman, 1989; Kyläheiko et al., 2011; Aw and Lee, 2014), we argue that a firm's foreign investments should result in (1) an increase in revenue (e.g., due to market-seeking foreign investments), (2) lower production costs (e.g., due to efficiency-seeking foreign investments) or (3) both larger revenues and lower production costs. We therefore control for both channels in order to have a better test of the effect of internationalization on firm performance. Accordingly, a positive (negative) effect of foreign investments on firm value is arguably attributable to (1) an expected increase (decrease) in revenue and/or (2) an expected increase (decrease) in profitability.

Japan provides us an opportunity to examine the relationship between foreign investments and firm performance for several reasons. First, since the 1980s many Japanese firms have made substantial investments in foreign countries (see e.g., Beechler and

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Yang, 1994; Chen and Hennart, 2002). During the initial waves of internationalization, Japanese firms tend to make market-seeking investments in foreign countries in order to export their products to foreign markets. Later on, Japanese firms tend to make efficiency-seeking and resource-seeking investments in foreign countries. Second, most Japanese firms have historically a long-term view of management (and, to some extent, long-term investing) and emphasize continuity (see e.g., England, 1983); therefore, foreign investments can reasonably be assumed to be taken with a long-term view. Third, Japanese investors generally have a positive view of foreign direct investments; thus, Japanese firms are potentially less discouraged to pursue possible value-increasing investments in foreign countries.[1] Last but not least, Japanese firms account for a large proportion of the world's largest firms.[2] With this in mind, given Japan's large shares of foreign direct investments in many developed and developing countries, it is surprising to observe that prior studies in this line of research in the context of Japan are limited.[3] Understanding the impact of foreign investments on firm value for Japanese firms would help other firms in Asia develop their international strategy. Accordingly, we examine a sample of publicly non-financial firms in Japan over the period between 1990 and 2016.

A key empirical challenge is that a firm's foreign investment is an endogenous variable that is most likely affected by unobserved factors such as corporate strategy. We address potential endogeneity inherent in the relationship between foreign investments and firm performance by using panel OLS regressions with firm-fixed effects to account for unobserved time-invariant firm-level characteristics. However, the panel OLS regressions cannot fully mitigate concerns with reverse causality and omitted (time-varying) variables. Therefore, we use the instrumental variable – two-stage least squares (IV-2SLS) regression analysis to explicitly address the concerns of potential endogeneity by substituting the endogenous foreign investments variable in the second-stage regression with the predicted value of foreign investments obtained from the first-stage regression.

To measure a firm's foreign investments, we use the ratio of foreign assets to total assets (FATA). To measure a firm's value, we use two proxies: (1) firm value growth (ΔFV) and (2) Tobin's q (TBQ). Our primary measure of a firm's value is ΔFV because TBQ, widely used in the finance literature, might be inflated due to the underinvestment issue (see Dybvig and Warachka, 2015). We use return on assets (ROA) as a proxy for a firm's performance.

Our IV-2SLS results show that for an average firm in Japan, variation in foreign investments is negatively associated with firm value, measured as ΔFV, and is negatively associated with firm performance, measured as ROA. We also find that foreign investments are not associated with TBQ. Some studies (e.g., Kotabe et al., 2002; de Jong and van Houten, 2014) find a positive relationship between internationalization and firm performance. Our analysis further shows that foreign investments are negatively associated with revenue growth but are not associated with firm efficiency. These findings suggest that making an investment in a foreign country does not necessarily lead to an improvement in revenue growth or firm efficiency. Our findings do not support the predictions that foreign investments exert an impact on firm performance through (1) the revenue generation channel (empirically measured as a firm's revenue growth) and (2) the efficiency enhancement channel (empirically measured as a firms' gross profit margin).

The results of our paper contribute to two bodies of research. First, this paper adds to a large body of research on the link between internationalization and firm performance (e.g., Hsu et al., 2013; Choi et al., 2014; de Jong and van Houten, 2014; Zhou and Wu, 2014). More specifically, we find evidence for the negative relationship between foreign investments and firm performance even at longer horizons. Second, this paper contributes to the literature on firm value (e.g., Fahlenbrach and Stulz, 2009; Basu et al., 2016; Cremers et al., 2017) by providing additional empirical insights to how foreign investments may explain variation in firm value. More importantly, using firm value growth, rather than Tobin's q, as a main proxy for firm value would alleviate concerns that using Tobin's q, which tends to be inflated due to the underinvestment issue, might lead to misleading results of the influence of foreign investments on firm value. Indeed, our results clearly show that the observed relationship between foreign investments and firm value varies, depending on the choice of a proxy for firm value.

The remainder of the article is structured as follows. Section 2 provides a brief overview of related theoretical studies and proposes three testable hypotheses. Section 3 contains a description of our research design, empirical strategies, data, sample and variables. Section 4 presents empirical results of the relationship between foreign investments, firm value and firm performance. Section 5 concludes the paper.

2. Brief literature review and hypothesis development

The literature on the effect of internationalization (also known as multinationalization or international diversification) on firm performance has been growing over the recent decades (e.g., Ethier, 1986; Kogut and Zander, 1993; Hsu et al., 2013; Choi et al., 2014; de Jong and van Houten, 2014). The international business literature highlights the role of market imperfections as one of key reasons as to why firms might benefit from engaging in international business activities. Earlier studies in the international business literature (see e.g., Buckley and Casson, 1976; Kogut and Zander, 1993; Markusen, 1995; Rugman and Verbeke, 2001) have been primarily built upon economic theory, especially the international trade theory (see e.g., Grossman and Helpman, 1989; Head et al., 1995; Ethier and Markusen, 1996; Roy and Viaene, 1998). Traditionally, it is argued that firms follow the sequential inter-

[1] For example, Choi et al. (2014) document that multinational firms in Japan exhibit a value premium relative to comparable domestic firms.

[2] For instance, Collinson and Rugman (2008) note that there are 64 Japanese multinational firms among the Top 500 largest firms in the world.

[3] For instance, a quick search for publications in the Journal of Banking and Finance and the Journal of Corporate Finance shows that there are only a few published articles on the linkage between foreign investments and firm value (or firm performance) in these journals since 2010. The relevant study using the Japanese data is Choi et al. (2014).

nationalization process. That is, firms first export their products (i.e. using the exporting channel as the mode of foreign market entry)[4] to international markets before setting up operations in a foreign country via, e.g., cross-border acquisitions (Cassiman and Golovko 2011). One of key aspects of a multinational firm is control of foreign operations (e.g., Ethier, 1986, 1994; Caves, 2007).

The central question in the literature is whether becoming a multinational firm indeed adds value. Several studies have attempted to answer this question; however, empirical results are mixed. On the one hand, prior studies such as Gande et al. (2009) show that for firms in the US, the effect of international diversification on firm value is positive. Furthermore, international diversification has been found to be positively associated with firm performance in the US (Kotabe et al., 2002; Tashman et al., 2019). In addition, some studies using international data also find that international diversification is positively related to firm performance in Taiwan (Hsu et al., 2013) and China (Xiao et al., 2013). On the other hand, there is empirical evidence for the negative effect of international diversification on firm value in the US (Denis et al., 2002; Fauver et al., 2004; Vithessonthi and Racela, 2016). In addition, international diversification is negatively associated with firm performance in India (Singla and George, 2013), China (Hu et al., 2019) and emerging market countries (Banalieva et al., 2018). However, some studies (e.g., Doukas and Lang, 2003; Cosset et al., 2016) report no significant relationship between international diversification and firm value.

According to the internationalization theory (see e.g., Caves, 2007), the benefits and costs of internationalization are largely determined by the realization of the efficiency-enhancing potential and the value-enhancing potential. As discussed in the literature (see e.g., Wang et al., 2012), foreign investments can exert an influence on firm value through two primary channels. First, foreign investments can expand a firm's customer base, thereby increasing revenue (Kyläheiko et al., 2011). Through a customer base channel (which is also known as horizontal foreign expansion), foreign investments, which can be classified as "market-seeking" investments (see e.g., Paul and Wooster, 2008), improve firm value by increasing the size of revenue and profits.[5] Second, foreign investments can improve a firm's efficiency and, hence, profitability.[6] Through the efficiency channel, foreign investments, which can be classified as resource-seeking investments (see e.g, Sethi et al., 2003), improve firm value by reducing costs through vertical foreign expansions (i.e., backward vertical expansions and/or forward vertical expansion) and/or through economies of scale.

When firms enter a foreign market, they might be at disadvantages, compared with local competitors, in terms of, e.g., local market knowledge. Accordingly, foreign firms are more likely to suffer from a liability of foreignness (see e.g., Zaheer, 1995; Johanson and Vahlne, 2009). From the prospective of the transaction cost theory, market transactions and foreign investments (e.g., a foreign outsourcing vs foreign direct investment decision) that will provide a firm with the most efficient outcomes should be chosen (Williamson, 2010).

Changing from a domestic firm to a multinational firm requires a reconfiguration of organizational structure, systems, processes and cultures, among other things, to manage the complexities associated with internationalization (Hitt et al., 1997). Consider, for example, using exporting as a mode of internationalization will add another dimension of complexity to an organization's structure (e.g., by establishing a business unit that is responsible for exporting activities). Foreign direct investments (e.g., joint ventures, acquisitions) will further increase the degrees of organizational complexities (e.g., human resource management becomes international human resource management). When these additional complexities are managed effectively, firms are therefore more likely to enhance their competences that will potentially be beneficial. At the same time, firms that are not able to manage these complexities are less able to fully realize the efficiency-enhancing potential and/or the revenue-generating potential. The speed at which firms can learn and adopt to the local market will affect the probability of success.

Based on the above discussion, whether foreign investments improve or worsen firm performance appear to be dependent on (1) the "ex ante" quality of foreign investments, (2) the "ex ante" capability to implement foreign investments (e.g., foreign operations) effectively, (3) "ex post" internal conditions and (4) "ex post" external conditions. For empirical studies, these factors (with the exception of external conditions) are typically unobservable. Prior studies provide some evidence to support the notion that the way in which a firm enters a foreign market (i.e. entry modes) can play an important role in determining whether foreign investments will be successful, which will subsequently affect firm performance (e.g., Brouthers, 2002).

If financial markets are efficient and investors believe that a firm's foreign investment would increase firm value through expected improvements in firm performance in the long run, the firm's stock prices should be adjusted upward. However, viewed in light of the agency theory (see e.g., Jensen, 1986; Eisenhardt, 1989; Edgerton, 2012), a higher degree of international diversification might destroy firm value, given that foreign investments allows managers to potentially pursue their self-interest activities that will not necessarily enhance firm value. Several scholars such as Gande et al. (2009) argue that with the presence of agency problems, international diversification should have a negative effect on firm value. In one of earlier studies on the valuation effect of international diversification, Denis et al. (2002) document a negative valuation effect of international diversification of firms in the US during the period 1984–1997.

As several studies suggest that it takes time for firms to learn and adopt to foreign markets (e.g., Nadolska and Barkema, 2007; Casillas and Moreno-Menéndez, 2014), it is reasonable to expect foreign investments to take, on average, a longer period of time than domestic investments to achieve a break-even point and realize positive cash flows. As a result, firms with relatively larger proportion of new foreign investments will most likely experience a decline in profits and/or profitability during the initial period of foreign

[4] See, e.g., Rose and Ito (2008) for a detailed discussion of how Japanese firms in the automobile industry have followed the sequential international process to enter foreign markets.

[5] For a detailed discussion on how a firm's internationalization strategy may attract new customers, please see e.g., Grossman and Helpman (1989) and Kyläheiko et al. (2011).

[6] For a detailed discussion on how foreign investments may improve firm productivity, please see, e.g., Aw and Lee (2014).

investments.

Building on our discussion above, we argue that a firm's foreign investment (e.g., building a new production facility in a foreign country) is more likely to have a positive effect on firm value when (1) investors have a relatively longer investment horizon (e.g., long-term investing), which will reduce the valuation discount of foreign investments, and (2) the issue of agency problems is relatively less severe (which will enhance the "ex ante" quality of foreign investments). The first condition might potentially hold in a few countries such as Japan and Germany, where the prevalence of short-termism is believed to be lower than that of other countries, and might not hold in many other countries (e.g., the US). The second condition is largely determined by the degree of financial markets development (including corporate governance practices). Regardless of the severity of agency problems, new foreign investments are expected to have a negative effect on firm performance in the short run, given that it takes time for these investments to reach a break-even point. When the issue of agency problems is less severe, investments decisions are made properly, and the implementation of foreign investments is effective (assuming no strategic response from direct competitors that might nullify the benefits of foreign investments), foreign investments might have a positive effect on firm performance in the long run. In summary, in the context of Japan, where long-term investing tends to be relatively more common and the degree of monitoring is believed to be relatively high, we propose the following testable hypotheses:

Hypothesis 1. Foreign investments are positively associated with firm value.

Hypothesis 2. Foreign investments are negatively associated with firm performance in the short run.

Hypothesis 3. Foreign investments are positively associated with firm performance in the long run.

3. Research design and data

3.1. Empirical design and data

To carry out our analysis of the effects of foreign investments on firm value and firm performance, we explore firm heterogeneity in Japan. We start with the universe of listed non-financial firms included in the Thompson Reuters Datastream database from 1990 to 2016. We retrieve a list of publicly listed non-financial firms in Japan and obtain financial data for each publicly listed firm used in the sample as well as industry- and country-level data from the Thompson Reuters Datastream database.[7] Firms that have been listed after 2013 are excluded from the sample.

3.2. Key variables of interest

3.2.1. Foreign investments

Based on our hypotheses, we need to construct a measure of foreign investments. A large body of research on internationalization typically uses the ratio of foreign assets to total assets (FATA) and/or the ratio of foreign sales to total sales (FSTS) to measure a firm's internationalization. For example, FATA has been used by several scholar such as Gomes and Ramaswamy (1999) and Singla and George (2013). As a result, we rely on FATA as a measure of a firm's foreign investments. A key limitation of using FATA as a measure of foreign investments is that we are unable to identify whether a firm's foreign investment is a horizontal foreign expansion (e.g., market-seeking investments) or a vertical foreign expansion (e.g., efficiency-seeking or resource-seeking investments, based on the resource dependence theory).

To identify whether a firm is purely domestic or international, we create FATADUM, which is an indicator that equals to one when FATA[8] is positive, and zero otherwise. A domestic firm is defined as having FATADUM equal to zero, whereas an international firm is defined as having FATADUM equal to one.

3.2.2. Firm value and firm performance

Prior studies in the finance literature (e.g., Doidge et al., 2004; Fang et al., 2009; McLean and Zhao, 2014; Basu et al., 2016) generally measure firm value using Tobin's q (TBQ), which is computed as the ratio of the sum of the market value of equity and the book value of total debt to the book value of total assets. However, Dybvig and Warachka (2015) recently point out that Tobin's q is an inappropriate proxy for firm performance as it suffers from the underinvestment issue (i.e., Tobin's q is inflated when a firm's investment is below its optimal level). Therefore, we use firm value growth (ΔFV), which is computed as the first difference in the natural logarithm of the sum of the market value of equity and the book value of total debt, as a proxy for firm value.[9] This measure of firm value is conceptually better than Tobin's q since it is less affected by the underinvestment issue. However, we also use Tobin's q as an alternative measure of firm value to check whether the results are sensitive to the measures of firm value.

Consistent with the finance and international business literature, we use return on assets (ROA) as a proxy for firm performance

[7] Banks, financial firms, and insurance companies are excluded from the sample.

[8] FATA is recoded as zero when the value of FATA is missing.

[9] Dybvig and Warachka (2015) suggest two operating efficiency measures—the scale-based operating efficiency and cost-based operating efficiency measures—to serve as a proxy for firm performance. The scale-based operating efficiency measure is computed as the ratio of gross profit (i.e. sales minus cost of goods sold) to sales. The cost-based operating efficiency measure is computed as the ratio of operating expenses to total assets.

(see e.g., Brockman et al., 2013; de Jong and van Houten, 2014; Vithessonthi and Racela, 2016). As in Brockman et al. (2013), ROA is computed as the ratio of earnings before interest, taxes, depreciations and amortization (EBITDA) to total assets. It is important to note that ROA is an operating performance measure.

3.3. Control variables

3.3.1. Firm-level control variables

In line with prior studies on firm value (see e.g., Pérez-González and Yun, 2013; Basu et al., 2016), we use a large set of firm-level factors that may affect firm value. The current ratio (CURRENT) is measured as the ratio of current assets to current liabilities. The dividend ratio (DIVTA) is computed as the ratio of cash dividends to total assets. Firm size (LNTA) is measured as the natural logarithm of real total assets (in millions USD).[10] Consistent with prior studies (see e.g., Ferris et al., 2017), we use performance volatility (RISK), which is measured as the ratio of the three-year rolling standard deviation of ROA to the three-year rolling mean of ROA, as a proxy for operating risk.

The property, plant and equipment ratio (PPETA) is the ratio of property, plant and equipment to total assets. The investment rate (CAPEXTA) is measured as the ratio of capital expenditure to one-period lagged total assets. Financial leverage (LEV) is computed as the ratio of total debt to total assets. The market-to-book ratio (MBV) is measured as the market value of common equity to the book value of common equity.

R&D intensity (RDTA) is measured as the ratio of R&D expenditure to one-period lagged total assets.[11] Revenue growth (ΔREV) is computed as the first difference in the natural logarithm of a firm's net sales. We adopt the concept of gross profit margin to estimate a firm's efficiency due to a lack of detailed information on inputs and outputs for our sample. Specifically, we use gross profit margin (GPM), which is computed as the ratio of costs of goods sold to net sales, as a measure of firm efficiency. A larger value of GPM would indicate a higher degree of production efficiency. GPM is theoretically similar to that of the scale-based operating efficiency measure proposed by Dybvig and Warachka (2015).[12]

3.3.2. Industry- and country-level control variables

Since industry-level conditions may affect firm value and firm performance, we use an industry's stock return (INDRETURN), which is computed as the first difference in the natural logarithm of the industry price index associated with a firm, as a time-varying industry-level control variable. To control for time-invariant industry-specific factors that may affect firm value and firm performance, we alternatively use an industry dummy (INDDUMMY)[13] in some specifications.

We include a set of country-level variables, including GDP growth and exchange rate change, to control for macroeconomic conditions on firm value and firm performance. A country's economic growth is measured as its annual nominal GDP growth rate (ΔGDP). We measure a country's exchange rate change (ΔFX) by using the first difference in the natural logarithm of an exchange rate of USD per Japanese Yen.[14] A net effect of a country's currency appreciation (i.e. a positive value of ΔFX) on firm value of exporting firms is expected to be negative.

3.4. Empirical strategy

A key empirical challenge in examining a relationship between foreign investments and firm value (firm performance) is that a firm's foreign investments might be endogenously determined. Another concern is that a firm's foreign investments might be affected by some variables that also determine firm performance. These empirical issues might contribute to the mixed findings observed in the literature.

3.4.1. Panel OLS regressions

Previous studies (see e.g., Mitton, 2006; Pérez-González and Yun, 2013; Jameson et al., 2014; Basu et al., 2016; Kang et al., 2017) typically estimate panel OLS regressions of firm value on a measure of corporate internationalization and various control variables. Therefore, to ensure that any potential differences in our results and theirs (see e.g., Singla and George, 2013; Zhou and Wu, 2014; Vithessonthi and Racela, 2016) are not primarily driven by differences in empirical approaches, we first analyze the effect of foreign investments on firm value by estimating a series of the following baseline panel OLS regression:

$$y_{i,j,t} = a_0 + a_1 FATADUM_{i,j,t-1} + \mathbf{b}\mathbf{Z}_{i,j,t-1} + \eta_i + \nu_t + \varepsilon_{i,j,t}, \tag{1}$$

where *i*, *j*, and *t* index firm, industry, and time, respectively. $y_{i,j,t}$ denotes a proxy for firm value for firm *i* in industry *j* at time *t*. In our main specification, we use ΔFV as a proxy for firm value. We then use TBQ as an alternative proxy for firm value. FATADUM is a binary variable that takes a value of one when FATA is reported and positive, and zero otherwise. $\mathbf{Z}_{i,j,t-1}$ is a vector of firm-, industry-,

[10] We controlled for inflation effects by deflating nominal values for the variables by the US GDP deflation at the constant 2010 price.

[11] When the value of R&D expenditure is missing, RDTA is recoded as zero.

[12] Their scale-based operating efficiency measure is computed as the ratio of gross profit to sales ((sales minus cost of goods sold)/sales) and is argued to represent a firm's scale decision.

[13] INDDUMMMY is based on the Level 2 classification of the Thompson Reuters Business Classification System.

[14] A positive value of the exchange rate return represents an appreciation of JPY against USD.

and country-level control variables; η_i is the firm-fixed effect; ν_t is the year-fixed effect; and $\varepsilon_{i,j,m,t}$ is an error term. All right-hand firm-, industry- and country-level control variables are lagged one period. We estimate panel OLS regressions with robust standard errors clustered at the firm level.

We include the firm-fixed effects in the panel OLS regressions to control for unobservable firm-specific and time-invariant heterogeneity that may affect firm value. We include the year-fixed effects to account for unobserved time-variant country-level and worldwide macroeconomic common shocks to all firms in the sample that may change firm value from year to year. We cannot simultaneously include country-level variables and year-fixed effects in a regression. As a result, when we add the country-level variables to a regression, we drop the year-fixed effects. In several models, we add industry-fixed effects × YEAR, which is a time trend variable, to control for any unobserved time-varying industry-level factors.

To test Hypothesis 1, which predicts a positive effect of foreign investments on firm value, we estimate the following panel OLS regression:

$$y_{i,j,t} = a_0 + a_1 FATA_{i,j,t-1} + \mathbf{bZ}_{i,j,t-1} + \eta_i + \nu_t + \varepsilon_{i,j,t}, \tag{2}$$

where $FATA_{i,j,t-1}$ is a proxy for a firm's foreign assets for firm i in industry j at time $t-1$. All other variables are defined as before. A positive coefficient on FATA would imply that firms with higher shares of foreign assets have higher firm value than firms with lower shares of foreign assets.

To test Hypotheses 2 and 3, which predict that foreign investments have a negative effect on firm performance in the short run and a positive effect on firm performance in the long run, respectively, we estimate the following panel OLS regressions:

$$ROA_{i,j,t} = a_0 + a_1 FATA_{i,j,t-1} + \mathbf{bZ}_{i,j,t-1} + \eta_i + \nu_t + \varepsilon_{i,j,t}, \tag{3}$$

$$ROA_{i,j,t} = a_0 + a_1 FATA_{i,j,t-1} + a_2 FATA_{i,j,t-2} + a_3 FATA_{i,j,t-3} + \mathbf{bZ}_{i,j,t-1} + \eta_i + \nu_t + \varepsilon_{i,j,t}, \tag{4}$$

where ROA is a proxy for firm performance. All other variables are defined as before. In Eq. (3), we use a one-period lag of FATA to capture the short-run effect of foreign investments on firm performance. In Eq. (4), we include up to three-period lags of FATA to capture the long-run effect of foreign investments on firm performance. In our alternative specifications, we include up to five-period lags of FATA to examine the long-run effect of foreign investments.

3.4.2. IV-2SLS regressions

Given that a firm's foreign investments may depend on factors that also affect firm value and firm performance, we additionally mitigate endogeneity concerns by using the instrumental variable – two-stage least squares (IV-2SLS) approach, which has often been used in the finance literature (see e.g., Giroud et al., 2012; Savaser and Şişli-Ciamarra, 2017). We attempt to use an instrumental variable that is correlated with the endogenous explanatory variable (e.g., FATA) but is unrelated to the error term in the main equation. We construct an instrumental variable for the proportion of foreign assets (i.e., FATA) using the cross-sectional average of the proportion of foreign assets of all firms in the same industry in the sample at time $t-1$. The first stage is a regression of FATA on the instrumental variable and a set of firm- and country- level control variable as follows:

$$FATA_{i,j,t} = a_0 + a_1 MEANFATA_{j,t-1} + \mathbf{bM}_{i,j,t-1} + \eta_i + \varepsilon_{i,j,t}, \tag{5}$$

where the dependent variable is FATA. The instrumental variable is $MEANFATA_{j,t-1}$, which is the cross-sectional average of FATA across all firms belonging to industry j in the sample at time $t-1$. $\mathbf{M}_{i,j,t-1}$ is a vector of country-, industry- and firm-level control variables, consisting of ΔGDP, ΔFX, INDRETURN, DIVTA, LEV, LNTA, PPETA, CAPEXTA, RDTA, MBV, and RISK. η_i is the firm-fixed effect. $\varepsilon_{i,j,t}$ is an error term.

Our motivation for using MEANFATA as the instrumental variable is as follows. First, a firm is more likely to closely monitor and evaluate its key competitors' strategy and its industry's conditions.[15] Hence, the industry's average foreign investments should play an important role when a firm makes its internationalization decision. Second, a firm's current foreign investment is less likely to influence the industry's foreign investment in the past. Suppose that at time t a firm decides to increase its investment in foreign markets after observing a sizable increase in the industry's foreign investments. There should be a time delay between the time at which a firm makes its foreign investment decision and the time at which its foreign investments are physically in place. Hence, there should be no major concern with possible reverse causality running from a firm's foreign investments at year $t+1$ to the industry's average foreign investments at year t. Therefore, we assume that MEANFATA is exogenous.

The validity for MEANFATA as an instrumental variable for FATA depends on two assumptions: (1) exogeneity with respect to individual firms' foreign investments and (2) the absence of the direct effect on a firm's value. We expect this instrumental variable to affect a firm's foreign investments directly but to affect a firm's value only indirectly through a firm's foreign investments. We test the validity for MEANFATA by examining the coefficient on MEANFATA in Eq. (5) and by testing whether MEANFATA has a direct effect on firm value. PFATA, which is the predicted value of FATA obtained from Eq. (5), is used as a proxy for a firm's foreign investments in the second-stage regressions as follows:

$$y_{i,j,t} = a_0 + a_1 PFATA_{i,j,t-1} + \mathbf{bZ}_{i,j,t-1} + \eta_i + \nu_t + \varepsilon_{i,j,t}, \tag{6}$$

[15] This idea is consistent with prior corporate finance studies that rely on an industry-level variable as an instrumental variable. For example, the industry's average leverage has been used as an instrumental variable for firms' leverage (see e.g., Ferrell et al., 2016).

Table 1
Summary statistics for the final sample.

	Mean	Median	Minimum	Maximum	S.D.	N
Panel A						
FATA	0.03	0.00	0.00	0.27	0.07	45,617
ΔFV	0.01	0.00	−0.46	0.50	0.24	45,617
TBQ	0.78	0.68	0.29	1.91	0.41	45,617
ROA	0.08	0.07	−0.02	0.19	0.05	45,617
ΔREV	0.02	0.02	−0.20	0.24	0.11	45,617
GPM	0.26	0.23	0.07	0.61	0.15	45,617
RISK	0.30	0.18	−1.23	1.95	0.61	45,617
CURRENT	1.85	1.52	0.62	4.74	1.07	45,617
DIVTA	0.01	0.01	0.00	0.02	0.01	45,617
LNTA	6.06	5.90	3.59	9.25	1.54	45,617
LEV	0.22	0.19	0.00	0.57	0.18	45,617
PPETA	0.30	0.29	0.03	0.65	0.17	45,617
CAPEXTA	0.04	0.03	0.00	0.11	0.03	45,617
RDTA	0.01	0.00	0.00	0.06	0.02	45,617
Panel B						
ΔGDP	0.01	0.01	−0.05	0.04	0.02	25
ΔFX	0.01	0.06	−0.20	0.14	0.10	25

Panel A of this table reports summary statistics for key firm-level variables for the final sample. Panel B reports summary statistics for country-level variables. FATA is the ratio of foreign assets to total assets. ΔFV is the first difference in the natural logarithm of the sum of the market value of equity and the book value of total debt. TBQ is computed as the ratio of the sum of the market value of equity and the book value of total debt to the book value of total assets. ROA is the ratio of EBITDA to total assets. RISK is the ratio of the three-year rolling standard deviation of ROA to the three-year rolling mean of ROA. CURRENT is the ratio of current assets to current liabilities. DIVTA is the ratio of dividends to total assets. LNTA is the natural logarithm of real total assets in millions USD. LEV is the ratio of total debt to total assets. PPETA is the ratio of property, plant and equipment to total assets. CAPEXTA is the ratio of capital expenditure to one-period lagged total assets. RDTA is the ratio of R&D expenditure to one-period lagged total assets. MBV is the ratio of the market value of equity to the book value of equity. Panel B of this table presents summary statistics for key macroeconomic and industry-level variables over the period 1990–2016. ΔGDP denotes GDP growth. The exchange rate change or return (ΔFX) is the first difference in the natural logarithm of an exchange rate of USD per Japanese Yen.

where $\mathbf{Z}_{i,j,t-1}$ is a vector of country-, industry- and firm-level control variables at time $t-1$. All other variables are defined as earlier. The regressions do not include year-fixed effects when country-level variables are included.

4. The impact of foreign investments on firm value and firm performance

4.1. Descriptive statistics

Panel A of Table 1 provides descriptive statistics of key variables for the final sample of 45,617 firm-year observations involving 3,141 firms, while Panel B of Table 1 provides descriptive statistics of key country-level variables. During the sample period, Japan has had an average GDP growth rate of about 0.91% and an average exchange rate return of 0.85%. While the economy of Japan has experienced a very slow growth rate during the sample period, it has suffered a negative annual GDP growth rate in only five years (i.e., in 1998, 1999, 2008, 2009 and 2011). The mean value of ΔFV is 0.01 (or about 1%), while the mean value of TBQ is 0.78. Concerning operating performance, the mean value of ROA is 0.08. The mean value FATA is 0.03. Surprisingly, the mean value of RDTA is only 0.01, suggesting a relatively low level of R&D expenditure for an average firm in Japan during the sample period.

To understand whether firms with foreign assets differ from firms without foreign assets, we spilt our sample using FATADUM, which is a binary variable, taking a value of one when FATA is positive, and zero otherwise. Panel A of Table 2 reports descriptive statistics of key variables from the sample in which FATADUM = 0, while Panel B of Table 2 reports descriptive statistics of key variables from the sample in which FATADUM = 1. ΔFV in Panel A is 0.00, while the mean value of ΔFV in Panel B is 0.02. The mean value of ROA in Panel A is 0.08, while the mean value of ROA in Panel B is 0.09. We observe that the mean value of RISK in Panel A is 0.30, which is equal to the mean value of RISK in Panel B. We perform tests for equality of means of ΔFV, ROA, and RISK between two subsamples. The tests show that there is no significant difference in the mean value of ROA but there is a significant difference in the mean value of ΔFV and RISK.

Table 3 presents a correlation coefficient matrix for the key firm-level variables. We generally find that the correlations between explanatory variables are low (e.g., $r < 0.30$).[16] As a result, we are not greatly concerned about a multicollenearity issue. We then use the whole set of the firm-level variables in our subsequent regression analysis. Since the correlation between ΔFV and TBQ is low, it raises a question of which of these two variables measures firm value more accurately. ΔFV and TBQ may potentially provide different sets of information about firm value.

[16] One exception is that LEV and CURRENT are highly correlated ($r < -0.597$, p-value < 0.001); therefore, we would include only LEV in regressions.

Table 2
Summary statistics for the final sample.

	Mean	Median	Minimum	Maximum	S.D.	N
Panel A: FATADUM = 0						
FATA	0.00	0.00	0.00	0.00	0.00	36,239
ΔFV	0.00	−0.01	−0.46	0.50	0.23	36,239
TBQ	0.76	0.65	0.29	1.91	0.41	36,239
ROA	0.08	0.07	−0.02	0.19	0.05	36,239
ΔREV	0.02	0.02	−0.20	0.24	0.10	36,239
GPM	0.26	0.23	0.07	0.61	0.15	36,239
RISK	0.30	0.19	−1.23	1.95	0.63	36,239
CURRENT	1.82	1.49	0.62	4.74	1.07	36,239
DIVTA	0.01	0.01	0.00	0.02	0.01	36,239
LNTA	5.76	5.59	3.59	9.25	1.44	36,239
LEV	0.22	0.19	0.00	0.57	0.18	36,239
PPETA	0.31	0.29	0.03	0.65	0.18	36,239
CAPEXTA	0.03	0.02	0.00	0.11	0.03	36,239
RDTA	0.01	0.00	0.00	0.06	0.01	36,239
MBV	1.18	0.88	0.32	3.56	0.87	36,239
Panel B: FATADUM = 1						
FATA	0.15	0.15	0.00	0.27	0.09	9,378
ΔFV	0.02	0.01	−0.46	0.50	0.24	9,378
TBQ	0.85	0.74	0.29	1.91	0.40	9,378
ROA	0.09	0.09	−0.02	0.19	0.05	9,378
ΔREV	0.03	0.04	−0.20	0.24	0.11	9,378
GPM	0.27	0.25	0.07	0.61	0.13	9,378
RISK	0.30	0.18	−1.23	1.95	0.50	9,378
CURRENT	1.98	1.64	0.62	4.74	1.05	9,378
DIVTA	0.01	0.01	0.00	0.02	0.01	9,378
LNTA	7.22	7.14	3.59	9.25	1.35	9,378
LEV	0.22	0.20	0.00	0.57	0.16	9,378
PPETA	0.28	0.28	0.03	0.65	0.13	9,378
CAPEXTA	0.04	0.04	0.00	0.11	0.03	9,378
RDTA	0.02	0.02	0.00	0.06	0.02	9,378
MBV	1.33	1.10	0.32	3.56	0.81	9,378

Panel A of this table reports summary statistics for key variables for the subsample in which FATADUM = 0. Panel B reports summary statistics for key variables for the subsample in which FATADUM = 1. FATADUM is a binary variable, taking a value of one when FATA is positive, and zero otherwise. FATA is the ratio of foreign assets to total assets. ΔFV is the first difference in the natural logarithm of the sum of the market value of equity and the book value of total debt. TBQ is the ratio of the sum of the market value of equity and the book value of total debt to the book value of total assets. ROA is the ratio of EBITDA to total assets. Please see other variable definitions in Table 1.

4.2. Results of panel OLS regressions

Table 4 presents the results of panel OLS regressions of firm value. In columns (1) − (4), the dependent variable is ΔFV, which is computed as the first difference in the natural logarithm of the sum of the market value of equity and the book value of total debt. In columns (5) − (8), the dependent variable is TBQ, which is measured as the ratio of the sum of the market value of equity and the book value of total debt to the book value of total assets. As discussed earlier, all firm-level variables are lagged one period. Firm-fixed effects are included in all specifications in Table 4 to control for unobservable firm-specific and time-invariant heterogeneity that may affect firm value.[17]

Column (1) presents the results of our baseline regression that includes firm-level, industry-level and country-level control variables and FATADUM, which is an indicator variable that equals to one when FATA is reported and positive. If firms with foreign investments perform better than firms without foreign investments, the coefficient on FATADUM should be positive and statistically significant. However, we find that the coefficient on FATADUM is negative and statistically significant at the 1% level, providing no empirical evidence to suggest that firms with foreign investments have higher firm value than firms without foreign investments. We find that the dividend ratio (DIVTA), leverage (LEV), firm size (LNTA), and capital expenditures (CAPEXTA) are negatively associated with firm value, while performance volatility (RISK), the property, plant, and equipment ratio (PPETA) and R&D intensity (RDTA) are positively associated with firm value.

To control for unobserved time-varying industry-level factors that may drive firm value, we add industry-fixed effects × YEAR, which is a time trend variable, in column (2) The results show that the coefficient on FATADUM remains negative and statistically significant at the 1% level. Taken together, the results in columns (1) and (2) suggest that firms with foreign investments have lower firm value than firms without foreign investments.

To test Hypothesis 1, we add FATA, which is the ratio of foreign assets to total assets, in column (3). The results show that the

[17] Hausman tests suggest that the fixed effects models are preferred to the random effects models.

Table 3
Correlations between key variables.

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1.FATA	1														
2.ΔFV	0.013***	1													
3.TBQ	0.098***	0.246***	1												
4.ROA	0.132***	0.174***	0.432***	1											
5.ΔREV	0.029***	0.265***	0.25***	0.361***	1										
6.GPM	0.014***	0.06***	0.43***	0.334***	0.11***	1									
7.RISK	0.003	−0.005	−0.079***	−0.083***	−0.036***	−0.039***	1								
8.CURRENT	0.029***	0.013***	0.163***	0.146***	−0.005	0.312***	−0.034***	1							
9.DIVTA	0.028***	−0.006	0.275***	0.467***	0.047***	0.346***	−0.046***	0.388***	1						
10.LNTA	0.354***	0.019***	−0.005	0.069***	0.015***	−0.137***	−0.026***	−0.182***	−0.033***	1					
11.LEV	0.011**	−0.026***	0.055***	−0.23***	−0.072***	−0.172***	0.046***	−0.597***	−0.442***	0.133***	1				
12.PPETA	−0.006	−0.028***	−0.067***	0.046***	−0.061***	−0.083***	−0.009**	−0.404***	−0.162***	0.14***	0.401***	1			
13.CAPEXTA	0.202***	0.073***	0.177***	0.341***	0.153***	0.047***	−0.044***	−0.179***	0.053***	0.209***	0.151***	0.451***	1		
14.RDTA	0.323***	0.002	0.134***	0.110***	−0.003	0.235***	0.005	0.228***	0.109***	0.159***	−0.129***	−0.112***	0.097***	1	
15.MBV	0.076***	0.228***	0.786***	0.311***	0.23***	0.305***	−0.06***	−0.003	0.142***	0.052***	0.095***	−0.1***	0.117***	0.094***	1

This table reports correlation coefficients between key variables for a sample of 45,617 firm-year observations. FATA is the ratio of foreign assets to total assets. ΔFV is the first difference in the natural logarithm of the sum of the market value of equity and the book value of total debt. TBQ the ratio of the sum of the market value of equity and the book value of total debt to the book value of total assets. ROA is the ratio of EBITDA to total assets. Please see other variable definitions in Table 1. Symbols *, **, and *** represent statistically significance at the 10%, 5%, and 1% levels, respectively.

Table 4
Panel OLS regressions of firm value.

Variable	(1) ΔFV Coeff.	P-value	(2) ΔFV Coeff.	P-value	(3) ΔFV Coeff.	P-value	(4) ΔFV Coeff.	P-value	(5) TBQ Coeff.	P-value	(6) TBQ Coeff.	P-value	(7) TBQ Coeff.	P-value	(8) TBQ Coeff.	P-value
ΔGDP_{t-1}	−0.529	0.000	−0.454	0.000	−0.533	0.000	−0.457	0.000	1.134	0.000	0.845	0.000	1.145	0.000	0.845	0.000
	(0.053)		(0.054)		(0.053)		(0.054)		(0.042)		(0.039)		(0.042)		(0.039)	
ΔFX_{t-1}	0.321	0.000	0.357	0.000	0.325	0.000	0.362	0.000	−0.006	0.671	−0.125	0.000	0.002	0.920	−0.125	0.000
	(0.012)		(0.012)		(0.012)		(0.012)		(0.015)		(0.014)		(0.015)		(0.014)	
$INDRETURN_{t-1}$	0.401	0.000	0.393	0.000	0.400	0.000	0.392	0.000	0.222	0.000	0.250	0.000	0.222	0.000	0.250	0.000
	(0.006)		(0.006)		(0.006)		(0.006)		(0.005)		(0.005)		(0.005)		(0.005)	
$RISK_{t-1}$	0.006	0.001	0.006	0.002	0.006	0.001	0.006	0.002	−0.011	0.000	−0.010	0.000	−0.011	0.000	−0.010	0.000
	(0.002)		(0.002)		(0.002)		(0.002)		(0.002)		(0.002)		(0.002)		(0.002)	
$DIVTA_{t-1}$	−4.372	0.000	−5.284	0.000	−4.390	0.000	−5.290	0.000	0.746	0.130	2.281	0.000	0.713	0.148	2.281	0.000
	(0.352)		(0.358)		(0.351)		(0.357)		(0.493)		(0.473)		(0.493)		(0.473)	
$LNTA_{t-1}$	−0.055	0.000	−0.063	0.000	−0.055	0.000	−0.063	0.000	−0.116	0.000	−0.093	0.000	−0.117	0.000	−0.093	0.000
	(0.004)		(0.004)		(0.004)		(0.004)		(0.007)		(0.007)		(0.007)		(0.007)	
LEV_{t-1}	−0.212	0.000	−0.168	0.000	−0.214	0.000	−0.171	0.000	0.291	0.000	0.100	0.000	0.293	0.000	0.100	0.000
	(0.015)		(0.015)		(0.015)		(0.015)		(0.023)		(0.023)		(0.023)		(0.023)	
$PPETA_{t-1}$	0.176	0.000	0.172	0.000	0.184	0.000	0.180	0.000	−0.368	0.000	−0.307	0.000	−0.367	0.000	−0.308	0.000
	(0.021)		(0.021)		(0.021)		(0.021)		(0.034)		(0.032)		(0.034)		(0.032)	
$CAPEXTA_{t-1}$	−0.493	0.000	−0.404	0.000	−0.482	0.000	−0.395	0.000	1.163	0.000	0.819	0.000	1.165	0.000	0.819	0.000
	(0.053)		(0.054)		(0.053)		(0.054)		(0.067)		(0.064)		(0.067)		(0.064)	
$RDTA_{t-1}$	0.948	0.000	0.618	0.000	1.018	0.000	0.687	0.000	−0.467	0.058	0.987	0.000	−0.538	0.029	0.984	0.000
	(0.164)		(0.169)		(0.164)		(0.169)		(0.246)		(0.238)		(0.246)		(0.238)	
$FATADUMMY_{t-1}$	−0.017	0.000	−0.027	0.000					−0.030	0.000	0.000	0.945				
	(0.004)		(0.005)						(0.007)		(0.007)					
$FATA_{t-1}$					−0.213	0.000	−0.235	0.000					−0.035	0.378	0.005	0.903
					(0.024)		(0.024)						(0.039)		(0.037)	
Firm-fixed effects	Yes		Yes		Yes		Yes		Yes		Yes		Yes		Yes	
Industry-fixed effects × YEAR	No		Yes		No		Yes		No		Yes		No		Yes	
R^2	0.219		0.225		0.220		0.226		0.718		0.733		0.718		0.733	
Adjusted R^2	0.157		0.162		0.158		0.164		0.695		0.712		0.695		0.712	
F-statistic	3.524		3.612		3.548		3.635		31.961		34.250		31.920		34.250	
P-value for F-statistic	0.000		0.000		0.000		0.000		0.000		0.000		0.000		0.000	
Firms included	3,121		3,121		3,121		3,121		3,121		3,121		3,121		3,121	
Firms-year observations	42,476		42,476		42,476		42,476		42,476		42,476		42,476		42,476	

This table presents panel OLS regressions of firm value. The dependent variable in columns (1) through (4) is firm value growth (ΔFV), which is computed as the first difference in the natural logarithm of the sum of the market value of equity and the book value of total debt, whereas the dependent variable in columns (5) through (8) is Tobin's q (TBQ), which is computed as the ratio of the sum of the market value of equity and the book value of total debt to the book value of total assets. The main independent variable of interest is FATADUM, which is a binary variable, taking a value of one when the degree of foreign investments (FATA), measured as the ratio of foreign assets to total assets, is positive and zero otherwise. Please see other variable definitions in Table 1. All explanatory variables are one period lagged. Firm-fixed effects are included in all regressions. YEAR is a time trend variable. Robust standard errors, which are clustered at the firm level, are reported in parentheses.

coefficient on FATA is negative and statistically significant at the 1% level. This finding indicates that foreign investments are negatively associated with firm value, which provides no support for Hypothesis 1. The point estimate for FATA is -0.213, indicating that a one standard deviation increase in foreign investments (0.07 or 7%) is associated with a 0.015 ($= -0.213 \times 0.07$) decrease in ΔFV or 149.1% lower at the mean ΔFV ($= -0.153/0.01$). Our result of a negative linkage between foreign investments and firm value is different from those found in prior studies. For example, Choi et al. (2014) show that the degree of internationalization, measured as the ratio of foreign sales to total sales, is positively associated with firm value of multinational firms in Japan. Adding the industry-fixed effects × YEAR in column (4) does not alter the result, as the coefficient on FATA is still negative and statistically significant at the 1% level.

Column (5) presents the results of the baseline regression of TBQ. We find that the coefficient on FATADUM in column (5) is negative and statistically significant at the 1% level, suggesting that firms with foreign investments have lower firm value than those without foreign investments. Adding the industry-fixed effects × YEAR in column (6) leads to the insignificant coefficient on FATA. The results in column (5) and (6) indicate that firms with foreign investments do not have higher firm value than firms without foreign investments.

We replace FATADUM with FATA in column (7) to test whether variation in foreign assets is associated with firm value. As before, we add the industry-fixed effects × YEAR to control for unobserved time-varying industry-level factors. The results in columns (7) and (8) suggest that foreign investments are not associated with TBQ, which provides no support for Hypothesis 1.

Overall, the results in Table 4 provide inconclusive evidence for a relationship between foreign investments and firm value. On the one hand, when firm value is measured as ΔFV, there is empirical evidence of a negative relationship between variation in foreign investments and firm value. On the other hand, when firm value is measured as TBQ, there is no empirical evidence of a relationship between variation in foreign investments and firm value. As discussed in Section 3, Dybvig and Warachka (2015) recently point out that Tobin's q is an inappropriate proxy for firm value because it suffers from the underinvestment issue. Therefore, one may argue that the different results found here might be driven by the problem of using Tobin's q as a proxy for firm value.

Table 5 presents the results of panel OLS regressions of firm performance, measured as ROA. Column (1) shows the results of our main regression that includes FATADUM and all country-, industry- and firm-level control variables. The coefficient on FATADUM in column (1) is positive and statistically significant at the 1% level, indicating that firms with foreign investments have better firm performance than firms without foreign investments. We then add the industry-fixed effects × YEAR, which is a time trend variable, in column (2) to control for unobserved time-varying industry-level factors. The results in column (2) show that the coefficient on FATADUM is positive but statistically insignificant.

To test Hypothesis 2, we first add FATA in column (3). The results show that the coefficient on FATA is positive and statistically significant at the 1% level. This result is similar to some studies that document a positive effect of internationalization on firm performance (Singla and George, 2013; Xiao et al., 2013) but is different from some studies that show a negative effect of internationalization on firm performance (Hsu et al., 2013; de Jong and van Houten, 2014). However, when we control for the time-varying unobserved industry-level factors by adding the industry-fixed effects × YEAR in column (4), we find that the positive effect of foreign investments on firm performance is no longer statistically significant. Taken together, our findings do not support Hypothesis 2.

To test Hypothesis 3, we add up to three-year lags of FATA in columns (5) and (6). The results in column (5) indicate that foreign investments have a positive long-run effect on firm performance, as the coefficient on the second- and third-lag is positive and statistically significant at the 10% and 5% levels, respectively. However, the results in column (6) show that the coefficient on all three lags of FATA is not statistically significant. Taken together, Hypothesis 3 is not supported. In summary, the results of panel OLS regressions do not support the notion that foreign investments would improve firm operating performance in the long run.

To test the direct effect of revenue growth on firm performance, we add revenue growth (ΔREV) in columns (1) and (2) of Table 6. We find that the coefficient on ΔREV in both columns (1) and (2) is positive and statistically significant at the 1% level, suggesting a positive relationship between revenue growth and firm performance. To test the direct effect of firm efficiency on firm performance, we add firm efficiency (GPM) in columns (3) and (4) in Table 6. The results provide empirical evidence of a positive and significant relation between firm efficiency and firm performance, as the coefficient on GPM in columns (3) and (4) is positive and statistically significant at the 1% level.

Columns (5) and (6) are the full model. Looking across all models in Table 6, we observe that a positive relation between foreign investments and firm performance is evident only when the time-varying unobserved industry-level factors are not controlled for (see columns (1), (3), and (5)). Once we control for the effects of the time-varying unobserved industry-level factors, the positive relation between foreign investments and firm performance is no longer evident (see columns (2), (4), and (6)). Based on these results, we argue that the mixed results observed in the literature might possibly be due to the fact that the time-varying unobserved industry-level factors have not been controlled for.

We now test whether foreign investments affect revenue growth and firm efficiency. Table 7 presents the results of panel OLS regressions of revenue growth and firm efficiency. ΔREV is the dependent variable in columns (1) through (4) while GPM is the dependent variable in columns (5) through (8). We include all country-, industry- and firm-level control variables in all models. The industry-fixed effects × YEAR are included in columns (2), (4), (6) and (8).

The results in columns (1) and (2) show that the coefficients on FATADUM are positive and statistically significant at the 1% level, suggesting that firms with foreign investments have higher revenue growth rates than firms without foreign investments. We replace FATADUM with FATA in columns (3) and (4) to test whether variation in foreign investments is associated with revenue growth. The coefficient on FATA in columns (3) and (4) is positive but statistically insignificant, indicating that larger foreign investments are not associated with higher revenue growth. Furthermore, we find that RISK, CAPEXTA, and MBV are positively associated with revenue

Table 5
Panel OLS regressions of firm performance.

Variable	(1) ROA Coeff.	P-value	(2) ROA Coeff.	P-value	(3) ROA Coeff.	P-value	(4) ROA Coeff.	P-value	(5) ROA Coeff.	P-value	(6) ROA Coeff.	P-value
ΔGDP_{t-1}	0.116	0.000	0.135	0.000	0.115	0.000	0.135	0.000	0.110	0.000	0.132	0.000
	(0.009)		(0.009)		(0.009)		(0.009)		(0.009)		(0.009)	
ΔFX_{t-1}	0.004	0.042	0.015	0.000	0.003	0.114	0.015	0.000	0.003	0.157	0.021	0.000
	(0.002)		(0.002)		(0.002)		(0.002)		(0.002)		(0.002)	
$INDRETURN_{t-1}$	0.010	0.000	0.007	0.000	0.010	0.000	0.007	0.000	0.010	0.000	0.009	0.000
	(0.001)		(0.001)		(0.001)		(0.001)		(0.001)		(0.001)	
$RISK_{t-1}$	−0.001	0.003	−0.001	0.003	−0.001	0.003	−0.001	0.003	−0.001	0.012	−0.001	0.013
	(0.000)		(0.000)		(0.000)		(0.000)		(0.000)		(0.000)	
$DIVTA_{t-1}$	−0.013	0.848	−0.198	0.004	−0.009	0.898	−0.198	0.004	−0.107	0.151	−0.300	0.000
	(0.069)		(0.069)		(0.069)		(0.069)		(0.074)		(0.074)	
$LNTA_{t-1}$	−0.006	0.000	−0.008	0.000	−0.006	0.000	−0.008	0.000	−0.008	0.000	−0.010	0.000
	(0.001)		(0.001)		(0.001)		(0.001)		(0.001)		(0.001)	
LEV_{t-1}	−0.071	0.000	−0.055	0.000	−0.071	0.000	−0.055	0.000	−0.072	0.000	−0.056	0.000
	(0.003)		(0.003)		(0.003)		(0.003)		(0.003)		(0.003)	
$PPETA_{t-1}$	0.004	0.413	0.001	0.849	0.003	0.482	0.001	0.902	−0.003	0.551	−0.004	0.452
	(0.004)		(0.004)		(0.004)		(0.004)		(0.005)		(0.005)	
$CAPEXTA_{t-1}$	0.069	0.000	0.087	0.000	0.068	0.000	0.087	0.000	0.064	0.000	0.077	0.000
	(0.010)		(0.009)		(0.010)		(0.009)		(0.010)		(0.010)	
$RDTA_{t-1}$	0.121	0.000	−0.008	0.799	0.124	0.000	−0.011	0.740	0.038	0.307	−0.069	0.066
	(0.032)		(0.032)		(0.032)		(0.032)		(0.038)		(0.038)	
MBV_{t-1}	0.014	0.000	0.015	0.000	0.014	0.000	0.015	0.000	0.014	0.000	0.015	0.000
	(0.000)		(0.000)		(0.000)		(0.000)		(0.000)		(0.000)	
$FATADUMMY_{t-1}$	0.004	0.000	0.001	0.403								
	(0.001)		(0.001)									
$FATA_{t-1}$					0.015	0.003	0.008	0.103	−0.003	0.579	0.004	0.446
					(0.005)		(0.005)		(0.005)		(0.005)	
$FATA_{t-2}$									0.009	0.092	0.005	0.339
									(0.005)		(0.005)	
$FATA_{t-3}$									0.011	0.046	−0.006	0.291
									(0.005)		(0.005)	
Firm-fixed effects	Yes		Yes		Yes		Yes		Yes		Yes	
Industry-fixed effects × YEAR	No		Yes		No		Yes		No		Yes	
R^2	0.607		0.615		0.607		0.615		0.620		0.629	
Adjusted R^2	0.576		0.584		0.575		0.584		0.587		0.595	
F-statistic	19.395		19.883		19.384		19.886		18.304		18.800	
P-value for F-statistic	0.000		0.000		0.000		0.000		0.000		0.000	
Firms included	3,121		3,121		3,121		3,121		2,961		2,961	
Firms-year observations	42,476		42,476		42,476		42,476		36,276		36,276	

This table presents panel OLS regressions of firm performance. The dependent variable is ROA, measured as the ratio of EBITDA to total assets. FATADUM is a binary variable, taking a value of one when the degree of foreign investments (FATA), measured as the ratio of foreign assets to total assets, is positive and zero otherwise. ΔREV is the first difference in the natural logarithm of a firm's net sales. GPM is the ratio of costs of goods sold to net sales. Please see other variable definitions in Table 1. All explanatory variables are one period lagged. Firm-fixed effects are included in all regressions. Robust standard errors, which are clustered at the firm level, are reported in parentheses.

growth while DIVTA, LNTA, LEV are negatively associated with revenue growth. These results are consistent with expectations.

The results in columns (5) and (6) indicate that firms with foreign investments have higher degrees of firm efficiency than firms without foreign investments, as the coefficient on FATADUM in columns (5) and (6) is positive and statistically significant at the 1% level. In addition, we find that DIVTA, RDTA and MBV are positively associated with firm efficiency, while LNTA, LEV and CAPEXTA are negatively associated with firm efficiency. To test whether variation in foreign investment is associated with firm efficiency, we replace FATADUM with FATA in columns (7) and (8). The results show that the coefficient on FATA is positive but statistically significant only at the 10% level; hence, there is only weak empirical evidence for a positive relation between foreign investments and firm efficiency.

In summary, the panel OLS results show that foreign investments are negatively associated with firm value growth but are not associated with Tobin's q. Furthermore, foreign investments are not associated with firm performance at short and long horizons. Although firms with foreign investments might have higher revenue growth than those without foreign investments, variation in foreign investments is not associated with revenue growth and firm efficiency, providing no empirical evidence to support the notion that larger foreign investments may improve firm performance through the revenue channel or the efficiency channel.

4.3. Results of IV-2SLS regressions

Since the results of the panel OLS regressions might be biased due to the endogeneity problem, as discussed in Section 3.4.2, we

Table 6
Panel OLS regressions of firm performance.

Variable	(1) ROA Coeff.	P-value	(2) ROA Coeff.	P-value	(3) ROA Coeff.	P-value	(4) ROA Coeff.	P-value	(5) ROA Coeff.	P-value	(6) ROA Coeff.	P-value
ΔGDP_{t-1}	0.110	0.000	0.129	0.000	0.101	0.000	0.120	0.000	0.097	0.000	0.117	0.000
	(0.009)		(0.009)		(0.009)		(0.009)		(0.009)		(0.009)	
ΔFX_{t-1}	0.011	0.000	0.022	0.000	0.003	0.094	0.015	0.000	0.011	0.000	0.021	0.000
	(0.002)		(0.002)		(0.002)		(0.002)		(0.002)		(0.002)	
$INDRETURN_{t-1}$	0.014	0.000	0.011	0.000	0.011	0.000	0.008	0.000	0.014	0.000	0.011	0.000
	(0.001)		(0.001)		(0.001)		(0.001)		(0.001)		(0.001)	
$RISK_{t-1}$	−0.001	0.009	−0.001	0.010	−0.001	0.009	−0.001	0.010	−0.001	0.020	−0.001	0.021
	(0.000)		(0.000)		(0.000)		(0.000)		(0.000)		(0.000)	
$DIVTA_{t-1}$	0.262	0.000	0.067	0.325	−0.169	0.012	−0.342	0.000	0.090	0.177	−0.091	0.174
	(0.068)		(0.068)		(0.067)		(0.067)		(0.067)		(0.067)	
$LNTA_{t-1}$	−0.008	0.000	−0.010	0.000	−0.005	0.000	−0.007	0.000	−0.008	0.000	−0.009	0.000
	(0.001)		(0.001)		(0.001)		(0.001)		(0.001)		(0.001)	
LEV_{t-1}	−0.060	0.000	−0.045	0.000	−0.065	0.000	−0.048	0.000	−0.055	0.000	−0.040	0.000
	(0.003)		(0.003)		(0.003)		(0.003)		(0.003)		(0.003)	
$PPETA_{t-1}$	0.013	0.002	0.010	0.017	0.005	0.265	0.003	0.454	0.014	0.001	0.012	0.006
	(0.004)		(0.004)		(0.004)		(0.004)		(0.004)		(0.004)	
$CAPEXTA_{t-1}$	0.035	0.000	0.055	0.000	0.057	0.000	0.076	0.000	0.029	0.002	0.048	0.000
	(0.009)		(0.009)		(0.009)		(0.009)		(0.009)		(0.009)	
$RDTA_{t-1}$	0.117	0.000	−0.011	0.719	0.073	0.019		(0.009)				
$RDTA_{t-1}$	0.117	0.000	−0.011	0.719	0.073	0.019	−0.060	0.057	0.072	0.019	−0.056	0.073
	(0.031)		(0.032)		(0.031)		(0.032)		(0.030)		(0.031)	
MBV_{t-1}	0.012	0.000	0.013	0.000	0.013	0.000	0.014	0.000	0.011	0.000	0.013	0.000
	(0.000)		(0.000)		(0.000)		(0.000)		(0.000)		(0.000)	
$FATA_{t-1}$	0.016	0.001	0.009	0.054	0.014	0.004	0.007	0.161	0.015	0.002	0.008	0.091
	(0.005)		(0.005)		(0.005)		(0.005)		(0.005)		(0.005)	
ΔREV_{t-1}	0.056	0.000	0.054	0.000					0.050	0.000	0.048	0.000
	(0.002)		(0.002)						(0.002)		(0.002)	
GPM_{t-1}					0.124	0.000	0.125	0.000	0.112	0.000	0.112	0.000
					(0.005)		(0.005)		(0.005)		(0.005)	
Firm-fixed effects	Yes		Yes		Yes		Yes		Yes		Yes	
Industry-fixed effects × YEAR	No		Yes		No		Yes		No		Yes	
R^2	0.616		0.624		0.617		0.624		0.624		0.631	
Adjusted R^2	0.586		0.593		0.586		0.594		0.594		0.602	
F-statistic	20.184		20.653		20.195		20.710		20.859		21.336	
P-value for F-statistic	0.000		0.000		0.000		0.000		0.000		0.000	
Firms included	3,121		3,121		3,121		3,121		3,121		3,121	
Firms-year observations	42,476		42,476		42,476		42,476		42,476		42,476	

This table presents panel OLS regressions of firm performance. The dependent variable is ROA, measured as the ratio of EBITDA to total assets. FATA is the ratio of foreign assets to total assets. ΔREV is the first difference in the natural logarithm of a firm's net sales. GPM is the ratio of costs of goods sold to net sales. Please see other variable definitions in Table 1. All explanatory variables are one period lagged. Firm-fixed effects are included in all regressions. Robust standard errors, which are clustered at the firm level, are reported in parentheses.

use the IV-2SLS estimation to additionally mitigate the endogeneity issue and test the robustness of our findings.

Table 8 presents the results of the IV-2SLS regressions of firm value. We include firm-fixed effects in all specifications in Table 8.[18] In the first-stage regression, the dependent variable is FATA, and MEANFATA, which is the cross-sectional average of FATA across all firms belong to industry j at time $t-1$ in the sample, is used as an instrumental variable. The results in column (1) show that the coefficient on MEANFATA is 0.782 and statistically significant at the 1% level, suggesting that MEANFATA is positively associated with FATA. The model's adjusted R^2 of 0.684 and the high F-statistic of 30.375 (exceeding the conventional threshold of F-statistic of about 10 for weak instrumental variables) provide a good indicator that the model is well specified and that our IVs are highly correlated with our endogenous variable, FATA. Additional test results indicate that MEANFATA, which is the instrumental variable, is not correlated with FATA nor with error terms in the second-stage regressions.

We use PFATA, which is the predicated value of FATA obtained from the first-stage regression, as a measure of foreign investments in the second-stage regression in columns (2) through (5). Columns (2) and (3) present the results of the second-stage regression with ΔFV as the dependent variable. The results in column (2) indicate that the coefficient on PFATA is −2.186 and statistically significant at the 1% level, suggesting that after explicitly controlling for the endogeneity concerns, foreign investments are negatively associated with firm value. However, interpreting these estimated IV-2SLS coefficients must be taken with caution as they are typically larger than the estimated coefficient of the OLS regressions (see e.g., Bernstein, 2015). We add the industry-fixed effects × YEAR in column (3) and still find that the coefficient on PFATA is still negative and statistically significant. Columns (4) and

[18] Hausman tests suggest that the fixed effects models are preferred to the random effects models.

Table 7
Panel OLS regressions of revenue growth and firm efficiency.

Variable	(1) ΔREV Coeff.	P-value	(2) ΔREV Coeff.	P-value	(3) ΔREV Coeff.	P-value	(4) ΔREV Coeff.	P-value	(5) GPM Coeff.	P-value	(6) GPM Coeff.	P-value	(7) GPM Coeff.	P-value	(8) GPM Coeff.	P-value
ΔGDP_{t-1}	1.235	0.000	1.258	0.000	1.232	0.000	1.257	0.000	0.106	0.000	0.116	0.000	0.105	0.000	0.116	0.000
	(0.032)		(0.032)		(0.032)		(0.032)		(0.010)		(0.010)		(0.010)		(0.010)	
ΔFX_{t-1}	0.010	0.076	0.021	0.000	0.007	0.207	0.020	0.000	0.003	0.298	0.010	0.001	0.002	0.600	0.009	0.001
	(0.006)		(0.006)		(0.005)		(0.006)		(0.003)		(0.003)		(0.003)		(0.003)	
$INDRETURN_{t-1}$	0.052	0.000	0.048	0.000	0.052	0.000	0.048	0.000	0.006	0.000	0.004	0.000	0.007	0.000	0.004	0.000
	(0.002)		(0.002)		(0.002)		(0.002)		(0.001)		(0.001)		(0.001)		(0.001)	
$RISK_{t-1}$	0.003	0.000	0.003	0.000	0.003	0.000	0.003	0.000	0.000	0.396	0.000	0.425	0.000	0.411	0.000	0.440
	(0.001)		(0.001)		(0.001)		(0.001)		(0.000)		(0.000)		(0.000)		(0.000)	
$DIVTA_{t-1}$	−2.658	0.000	−2.892	0.000	−2.646	0.000	−2.893	0.000	0.639	0.000	0.410	0.000	0.645	0.000	0.410	0.000
	(0.158)		(0.161)		(0.158)		(0.161)		(0.102)		(0.100)		(0.102)		(0.100)	
$LNTA_{t-1}$	−0.033	0.000	−0.033	0.000	−0.032	0.000	−0.033	0.000	−0.014	0.000	−0.016	0.000	−0.014	0.000	−0.016	0.000
	(0.002)		(0.002)		(0.002)		(0.002)		(0.002)		(0.002)		(0.002)		(0.002)	
LEV_{t-1}	−0.062	0.000	−0.041	0.000	−0.063	0.000	−0.041	0.000	−0.022	0.000	−0.014	0.005	−0.022	0.000	−0.014	0.006
	(0.007)		(0.007)		(0.007)		(0.007)		(0.005)		(0.005)		(0.005)		(0.005)	
$PPETA_{t-1}$	−0.003	0.723	0.000	0.992	−0.004	0.674	0.000	0.996	0.005	0.519	−0.004	0.599	0.004	0.561	−0.004	0.559
	(0.009)		(0.009)		(0.009)		(0.009)		(0.007)		(0.007)		(0.007)		(0.007)	
$CAPEXTA_{t-1}$	0.089	0.000	0.104	0.000	0.089	0.000	0.105	0.000	−0.048	0.000	−0.037	0.004	−0.049	s	−0.037	0.004
	(0.024)		(0.024)		(0.024)		(0.024)		(0.013)		(0.013)		(0.013)		(0.013)	
$RDTA_{t-1}$	0.082	0.245	−0.116	0.110	0.104	0.142	−0.111	0.129	0.373	0.000	0.296	0.000	0.384	0.000	0.296	0.000
	(0.071)		(0.073)		(0.071)		(0.073)		(0.050)		(0.050)		(0.050)		(0.050)	
MBV_{t-1}	0.027	0.000	0.028	0.000	0.026	0.000	0.028	0.000	0.009	0.000	0.010	0.000	0.009	0.000	0.010	0.000
	(0.001)		(0.001)		(0.001)		(0.001)		(0.001)		(0.001)		(0.001)		(0.001)	
$FATADUMMY_{t-1}$	0.011	0.000	0.005	0.008					0.006	0.000	0.005	0.000				
	(0.002)		(0.002)						(0.001)		(0.001)					
$FATA_{t-1}$					0.018	0.101	0.003	0.808					0.013	0.091	0.014	0.071
					(0.011)		(0.011)						(0.008)		(0.008)	
Firm-fixed effects	Yes		Yes		Yes		Yes		Yes		Yes		Yes		Yes	
Industry-fixed effects × YEAR	No		Yes		No		Yes		No		Yes		No		Yes	
R^2	0.278		0.284		0.278		0.284		0.920		0.922		0.920		0.922	
Adjusted R^2	0.221		0.226		0.220		0.226		0.913		0.916		0.913		0.916	
F-statistic	4.843		4.942		4.832		4.939		143.939		147.281		143.804		147.189	
P-value for F-statistic	0.000		0.000		0.000		0.000		0.000		0.000		0.000		0.000	
Firms included	3,121		3,121		3,121		3,121		3,121		3,121		3,121		3,121	
Firms-year observations	42,476		42,476		42,476		42,476		42,476		42,476		42,476		42,476	

This table presents panel OLS regressions of revenue growth and firm efficiency. In columns (1)–(4), the dependent variable is revenue growth (ΔREV), measured as the first difference in the natural logarithm of a firm's net sales. In columns (5)–(8), the dependent variable is firm efficiency (GPM) is measured as the ratio of costs of goods sold to net sales. FATA is the ratio of foreign assets to total assets. Please see other variable definitions in Table 1. All explanatory variables are one period lagged. Firm-fixed effects are included in all regressions. Robust standard errors, which are clustered at the firm level, are reported in parentheses.

Table 8
IV-2SLS estimation of the effect of internationalization on firm value.

Variable	(1) FATA Coeff.	P-value	(2) ΔFV Coeff.	P-value	(3) ΔFV Coeff.	P-value	(4) TBQ Coeff.	P-value	(5) TBQ Coeff.	P-value
ΔGDP_{t-1}	−0.166 (0.011)	0.000	−0.544 (0.054)	0.000	−0.482 (0.055)	0.000	0.997 (0.042)	0.000	0.746 (0.039)	0.000
ΔFX_{t-1}	−0.034 (0.003)	0.000	0.368 (0.013)	0.000	0.415 (0.013)	0.000	−0.004 (0.016)	0.807	−0.134 (0.015)	0.000
$INDRETURN_{t-1}$	−0.001 (0.001)	0.449	0.387 (0.006)	0.000	0.380 (0.006)	0.000	0.227 (0.005)	0.000	0.241 (0.005)	0.000
$RISK_{t-1}$	0.000 (0.000)	0.792	0.006 (0.002)	0.001	0.006 (0.002)	0.002	−0.008 (0.002)	0.001	−0.007 (0.002)	0.001
$DIVTA_{t-1}$	−0.208 (0.100)	0.037	−5.114 (0.366)	0.000	−5.859 (0.372)	0.000	0.684 (0.506)	0.176	2.169 (0.487)	0.000
$LNTA_{t-1}$	0.009 (0.001)	0.000	−0.047 (0.005)	0.000	−0.058 (0.005)	0.000	−0.114 (0.008)	0.000	−0.089 (0.007)	0.000
LEV_{t-1}	−0.013 (0.005)	0.007	−0.254 (0.015)	0.000	−0.212 (0.016)	0.000	0.271 (0.024)	0.000	0.086 (0.024)	0.000
$PPETA_{t-1}$	0.020 (0.007)	0.005	0.256 (0.022)	0.000	0.260 (0.022)	0.000	−0.326 (0.035)	0.000	−0.274 (0.033)	0.000
$CAPEXTA_{t-1}$	0.033 (0.013)	0.014	−0.467 (0.056)	0.000	−0.388 (0.056)	0.000	0.998 (0.068)	0.000	0.728 (0.066)	0.000
$RDTA_{t-1}$	0.421 (0.050)	0.000	1.537 (0.182)	0.000	1.375 (0.187)	0.000	−0.573 (0.259)	0.027	0.885 (0.250)	0.000
MBV_{t-1}	0.001 (0.001)	0.093								
$MEANFATA_{t-1}$	0.782 (0.028)	0.000								
$PFATA_{t-1}$			−2.186 (0.094)	0.000	−2.459 (0.099)	0.000	0.027 (0.148)	0.856	−0.259 (0.143)	0.070
Firm-fixed effects	Yes		Yes		Yes		Yes		Yes	
Industry-fixed effects × YEAR	No		No		Yes		No		Yes	
R^2	0.707		0.235		0.242		0.727		0.741	
Adjusted R^2	0.684		0.170		0.177		0.704		0.719	
F-statistic	30.375		3.606		3.721		31.322		33.380	
P-value for F-statistic	0.000		0.000		0.000		0.000		0.000	
Firms included	3,121		3,079		3,079		3,079		3,079	
Firms-year observations	42,476		39,355		39,355		39,355		39,355	

This table presents the IV-2SLS regressions of firm value. In column (1), the dependent variable in the first-stage regression is FATA. Columns (2)–(5) present the results of the second-stage regression. In column (2) and (3), the dependent variable is firm value growth (ΔFV), which is computed as the first difference in the natural logarithm of the sum of the market value of equity and the book value of total debt. In columns (4) and (5), the dependent variable is Tobin's q (TBQ), which is computed as the ratio of the sum of the market value of equity and the book value of total debt to the book value of total assets. PFATA is the predicated value of FATA obtained from the first-stage regression. Please see other variable definitions in Table 1. All explanatory variables are one period lagged. Firm-fixed effects are included in all regressions. Robust standard errors, which are clustered at the firm level, are reported in parentheses.

(5) present the results of the second-stage regressions with TBQ as the dependent variable. The results in both columns (4) and (5) indicate that foreign investments are not associated with firm value, as the coefficients on PFATA are not statistically significant.

Overall, the 2SLS regression results provide mixed evidence on the relationship between foreign investments and firm value. On the one hand, foreign investments are negatively associated with firm value growth. On the other hand, foreign investments are not associated with Tobin's q. Taken together, our results do not support Hypothesis 1 that predicts a positive relation between foreign investments and firm value.

Table 9 reports the results of IV-2SLS regressions of firm performance, measured as ROA. As before, firm-fixed effects are included in all specifications in Table 9.[19] The dependent variable in the first-stage regression is FATA. Column (1) provides the results of the first-stage regression. We estimate the second-stage regressions with and without the industry-fixed effects × YEAR. As the results are qualitatively similar, columns (2) through (6) of Table 9 report the results of the second-stage regressions that include the industry-fixed effects × YEAR.

In column (2), we find that the coefficient on PFATA is negative and statistically significant at the 5% level. We have three lags of PFATA in column (3) to simultaneously test both the short and long-run effects of foreign investments on firm performance. As can be seen, the coefficient on the first lag of PFATA is not statistically significant, suggesting that foreign investments are not associated with firm performance at a short horizon. However, the coefficient on the second and third lag of PFATA is negative and statistically significant at the 1% level, which implies that foreign investments ae negatively associated with firm performance at a longer

[19] Hausman tests suggest that the fixed effects models are preferred to the random effects models.

Table 9
IV-2SLS estimation of the effect of internationalization on firm performance.

Variable	(1) FATA Coeff.	P-value	(2) ROA Coeff.	P-value	(3) ROA Coeff.	P-value	(4) ROA Coeff.	P-value	(5) ROA Coeff.	P-value	(6) ROA Coeff.	P-value
ΔGDP_{t-1}	−0.166	0.000	0.130	0.000	0.132	0.000	0.127	0.000	0.116	0.000	0.114	0.000
	(0.011)		(0.009)		(0.009)		(0.009)		(0.009)		(0.009)	
ΔFX_{t-1}	−0.034	0.000	0.017	0.000	0.032	0.000	0.024	0.000	0.017	0.000	0.023	0.000
	(0.003)		(0.002)		(0.003)		(0.002)		(0.002)		(0.002)	
$INDRETURN_{t-1}$	−0.001	0.449	0.007	0.000	0.009	0.000	0.011	0.000	0.009	0.000	0.012	0.000
	(0.001)		(0.001)		(0.001)		(0.001)		(0.001)		(0.001)	
$RISK_{t-1}$	0.000	0.792	−0.001	0.006	−0.001	0.003	−0.001	0.017	−0.001	0.010	−0.001	0.024
	(0.000)		(0.000)		(0.000)		(0.000)		(0.000)		(0.000)	
$DIVTA_{t-1}$	−0.208	0.037	−0.239	0.001	−0.362	0.000	0.038	0.593	−0.386	0.000	−0.124	0.075
	(0.100)		(0.072)		(0.077)		(0.071)		(0.070)		(0.070)	
$LNTA_{t-1}$	0.009	0.000	−0.009	0.000	−0.009	0.000	−0.011	0.000	−0.008	0.000	−0.011	0.000
	(0.001)		(0.001)		(0.001)		(0.001)		(0.001)		(0.001)	
LEV_{t-1}	−0.013	0.007	−0.056	0.000	−0.057	0.000	−0.045	0.000	−0.049	0.000	−0.040	0.000
	(0.005)		(0.003)		(0.004)		(0.003)		(0.003)		(0.003)	
$PPETA_{t-1}$	0.020	0.005	0.001	0.805	−0.001	0.825	0.011	0.017	0.004	0.417	0.012	0.007
	(0.007)		(0.005)		(0.005)		(0.005)		(0.004)		(0.004)	
$CAPEXTA_{t-1}$	0.033	0.014	0.079	0.000	0.068	0.000	0.047	0.000	0.069	0.000	0.041	0.000
	(0.013)		(0.010)		(0.011)		(0.010)		(0.010)		(0.010)	
$RDTA_{t-1}$	0.421	0.000	−0.018	0.591	−0.001	0.971	−0.027	0.429	−0.072	0.032	−0.074	0.025
	(0.050)		(0.034)		(0.041)		(0.034)		(0.034)		(0.033)	
MBV_{t-1}	0.001	0.093	0.015	0.000	0.016	0.000	0.013	0.000	0.014	0.000	0.013	0.000
	(0.001)		(0.000)		(0.000)		(0.000)		(0.000)		(0.000)	
$MEANFATA_{t-1}$	0.782	0.000										
	(0.028)											
$PFATA_{t-1}$			−0.037	0.037	−0.032	0.116	−0.009	0.607	−0.028	0.108	−0.004	0.827
			(0.018)		(0.020)		(0.017)		(0.017)		(0.017)	
$PFATA_{t-2}$					−0.101	0.000						
					(0.023)							
$PFATA_{t-3}$					−0.060	0.003						
					(0.020)							
ΔREV_{t-1}							0.054	0.000			0.048	0.000
							(0.002)				(0.002)	
GPM_{t-1}									0.129	0.000	0.115	0.000
									(0.005)		(0.005)	
Firm-fixed effects	Yes		Yes		Yes		Yes		Yes		Yes	
Industry-fixed effects × YEAR	No		Yes		Yes		Yes		Yes		Yes	
R^2	0.707		0.623		0.636		0.632		0.633		0.640	
Adjusted R^2	0.684		0.591		0.601		0.600		0.601		0.609	
F-statistic	30.375		19.236		18.260		19.996		20.045		20.665	
P-value for F-statistic	0.000		0.000		0.000		0.000		0.000		0.000	
Firms included	3,121		3,079		2,877		3,079		3,079		3,079	
Firms-year observations	42,476		39,355		33,315		39,355		39,355		39,355	

This table presents the IV-2SLS regressions of firm performance. In column (1), the dependent variable in the first-stage regression is FATA. In columns (2)–(6), the dependent variable in the second-stage regression is ROA, measured as the ratio of EBITDA to total assets. PFATA is the predicated value of FATA obtained from the first-stage regression. Please see other variable definitions in Table 1. All explanatory variables are one period lagged. Firm-fixed effects are included in all regressions. Robust standard errors, which are clustered at the firm level, are reported in parentheses.

horizon.

Overall, the results in columns (2) and (3) provide no empirical support for Hypothesis 2, which predicts a negative short-run effect of foreign investments on firm performance. In addition, the results do not support Hypothesis 3, which predicts a positive long-run effect of foreign investments on firm performance.

The results in column (4) show that revenue growth (ΔREV) is positively associated with firm performance, as the coefficient on ΔREV is positive and statistically significant at the 1% level. We find that the coefficient on PFATA is no longer statistically significant. To test the effect of firm efficiency on firm performance, we replace ΔREV with GPM in column (5) and find that firm efficiency is positively associated with firm performance, and, as in column (4), foreign investments are no longer associated with firm performance. Column (6) presents the results of the full model, showing that the direct effect of foreign investments on firm performance is statistically insignificant, while the direct effects of revenue growth and firm efficiency remain evident. Taken together, the results provide some support to the notion that revenue growth and firm efficiency might potentially mediate the short-run effect of foreign investments on firm performance, which will be discussed in more detail below.

Table 10 presents the results of IV-2SLS regressions of revenue growth and firm efficiency. We include firm-fixed effects in all specifications in Table 10. Column (1) provides the results of the first-stage regression, where the dependent variable is FATA. In

Table 10
IV-2SLS estimation of the effect of internationalization on revenue growth and firm efficiency.

Variable	(1) FATA Coeff.	P-value	(2) ΔREV Coeff.	P-value	(3) GPM Coeff.	P-value
ΔGDP_{t-1}	−0.166	0.000	1.231	0.000	0.109	0.000
	(0.011)		(0.033)		(0.010)	
ΔFX_{t-1}	−0.034	0.000	0.031	0.000	0.011	0.000
	(0.003)		(0.006)		(0.003)	
$INDRETURN_{t-1}$	−0.001	0.449	0.046	0.000	0.004	0.000
	(0.001)		(0.002)		(0.001)	
$RISK_{t-1}$	0.000	0.792	0.003	0.001	0.000	0.760
	(0.000)		(0.001)		(0.000)	
$DIVTA_{t-1}$	−0.208	0.037	−2.969	0.000	0.342	0.001
	(0.100)		(0.170)		(0.103)	
$LNTA_{t-1}$	0.009	0.000	−0.035	0.000	−0.016	0.000
	(0.001)		(0.002)		(0.002)	
LEV_{t-1}	−0.013	0.007	−0.048	0.000	−0.014	0.007
	(0.005)		(0.007)		(0.005)	
$PPETA_{t-1}$	0.020	0.005	0.011	0.272	−0.006	0.394
	(0.007)		(0.010)		(0.007)	
$CAPEXTA_{t-1}$	0.033	0.014	0.095	0.000	−0.035	0.009
	(0.013)		(0.025)		(0.013)	
$RDTA_{t-1}$	0.421	0.000	−0.078	0.330	0.280	0.000
	(0.050)		(0.080)		(0.052)	
MBV_{t-1}	0.001	0.093	0.029	0.000	0.010	0.000
	(0.001)		(0.001)		(0.001)	
$MEANFATA_{t-1}$	0.782	0.000				
	(0.028)					
$PFATA_{t-1}$			−0.421	0.000	−0.030	0.267
			(0.042)		(0.027)	
Firm-fixed effects	Yes		Yes		Yes	
Industry-fixed effects × YEAR	No		Yes		Yes	
R^2	0.707		0.289		0.926	
Adjusted R^2	0.684		0.227		0.919	
F-statistic	30.375		4.723		144.842	
P-value for F-statistic	0.000		0.000		0.000	
Firms included	3,121		3,079		3,079	
Firms-year observations	42,476		39,355		39,355	

This table presents the IV-2SLS regressions of firm performance. In column (1), the dependent variable in the first-stage regression is FATA. Columns (2)–(3) present the results of the second-stage regression. In column (2), the dependent variable is revenue growth (ΔREV), measured as the first difference in the natural logarithm of a firm's net sales. In column (3), the dependent variable is gross profit margin (GPM), which is a proxy for firm efficiency. PFATA is the predicated value of FATA obtained from the first-stage regression. Please see other variable definitions in Table 1. All explanatory variables are one period lagged. Firm-fixed effects are included in all regressions. Robust standard errors, which are clustered at the firm level, are reported in parentheses.

column (2), the dependent variable of the second-stage regression is ΔREV. In column (3), the dependent variable of the second-stage regression is GPM. As in Table 9, we report the results of the second-stage regressions that include the industry-fixed effects × YEAR in Table 10.

The results in column (2) of Table 10 show that the effect of foreign investments on revenue growth in the short run is negative, as the coefficient on PFATA is negative and statistically significant. However, the results in column (3) provides no empirical evidence of a linkage between foreign investments and firm efficiency as the coefficient on PFATA is not statistically significant. A plausible explanation for this result is that other firms (i.e. their competitors) may pursue a similar internationalization strategy, thereby neutralizing any potential efficiency gain that a firm may obtain from its foreign investment project.

The results of columns (2) and (4) of Table 9 and the results of column (2) of Table 10 suggest that foreign investments might potentially affect firm performance via revenue growth. That is, foreign investments have a negative effect on revenue growth (see column (2) of Table 10) and a negative effect on ROA (see column (2) of Table 9). However, the negative effect of foreign investments on ROA is no longer evident when revenue growth is included in the model (see column (4) of Table 9). Our results further suggest that foreign investments might not affect firm performance through firm efficiency. That is, as foreign investments have no direct effect on firm efficiency (see column (3) of Table 10).

As a firm's investment decisions and outcomes might potentially be driven by the cost of capital, future work might consider the inclusion of the cost of capital measure (see e.g., Kerins et al., 2004; Hann et al., 2013; Pattitoni et al., 2013; Frank and Shen, 2016) to test whether the relationship between internationalization and firm value might be affected by the cost of capital. In this study, we have not included the cost of capital so that our results can be directly compared with prior related studies (see e.g., Cosset et al., 2016; Vithessonthi and Racela, 2016; Hu et al., 2019). We leave this additional test to future research.

5. Conclusion

Recent studies show that the influence of internationalization on firm performance is unclear (see e.g., Hsu et al., 2013; de Jong and van Houten, 2014; Cosset et al., 2016; Vithessonthi and Racela, 2016; Hu et al., 2019). Our paper adds to the literature by revisiting channels through which foreign investments may exert an influence on firm value and firm performance. We empirically test our predictions using a large panel sample of publicly listed non-financial firms in Japan over the 1990–2016 period.

Our IV-2SLS results indicate that firms with larger foreign investments tend to have lower firm value. In addition, firms with larger foreign investments have poorer firm performance at relatively longer horizons. These findings are puzzling. In hindsight, as an external observer, one may argue that firms' decisions to undertaking their foreign investments may not be rational. However, what we cannot say is whether without making these foreign investments, these firms would have had higher or lower firm value. It is plausible that the Japanese firms might ex ante be forced by industry conditions to engage in foreign investments at the time. For instance, using the arguments from the literature on strategy and strategic interaction (see e.g., Zajac and Bazerman, 1991; Makadok and Barney, 2001; Chatain, 2013; Bustamante, 2015), we postulate that when firms notice that their competitors have already begun to make a series of strategic investments overseas, they may consider these investments as a treat to their competitive advantage and will be more likely to counter their competitors' strategic actions by undertaking their foreign investments themselves to maintain their competitive advantage.

We find empirical evidence to support the notion that revenue growth mediates the short-run relationship between foreign investments and firm performance. However, foreign investments do not affect firm performance via firm efficiency. To the best of our knowledge, we probably provide the first empirical evidence of the mediating effect of revenue growth on the relationship between foreign investments and firm performance for firms in Japan.

Understanding how foreign investments are associated with firm performance and/or firm value is crucial for designing and implementing a firm's internationalization strategy that is expected to help establish competitive advantages. Our study highlights the importance of the channels through which foreign investments might enhance the performance of a firm. In theory, any investment should result in (1) an increase in revenue, (2) a decrease in costs or (3) both. However, in practice, the investment's outcomes might be affected by several expected and unexpected factors, thereby creating a major challenge for an empirical analysis of the effect of foreign investments on firm performance. Our findings suggest that managers may find it useful to take into account the fact that an investment in a foreign country may not necessarily improve firm performance. However, it is difficult to predict what might have happened had foreign investments not been initially deployed. Perhaps, by not making a foreign investment, a firm might potentially have experienced a decline in performance (e.g., due to losing competitive advantages).

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