On the Origins of the Multinational Premium*

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Abstract

This paper studies the relationship between management, firm expansion, and firm risk exposure. We document three empirical regularities. First, multinational enterprises (MNEs) are more likely to be run by managers with previous experience in multinational expansion. Second, current and future MNEs are riskier than firms that never enter foreign markets. Third, managers' characteristics contribute to explain MNEs' risk premia and risk exposure. To rationalize these facts, we develop a dynamic model in which managerial experience shapes the relationship between firm characteristics, selection into FDI, and risk premia. The model lends itself to a quantitative analysis that exploits its mechanisms to suggest that distortions to the market for managerial talent may have unwanted effects on multinational activity and financial market outcomes.

Keywords: multinational firms, management, stock returns.

JEL Classification: F12, F23, F36.

1 Introduction

Managers have an impact on many firm decisions, some of them related to the risks firms are exposed to. In this paper, we study the relationship between management, firm expansion, and firm risk exposure. More precisely, we examine firm expansion via entry into foreign markets through foreign affiliates (multinational entry). We argue that managers play an important role for the decisions of firms to engage in multinational activity, and that managerial characteristics affect the risk exposure of these firms. Specifically, we focus on the CEO role as CEOs have a strong influence on firms' decisions that affect strategy, risk, portfolio, and

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footprint. CEOs may have a direct impact on decision making or, equivalently, influence decision making by designing processes, culture, and structures at the firm level. Therefore, it is likely that CEO characteristics simultaneously determine the firm's risk profile and its international presence, directly or indirectly.

We establish three empirical regularities. First, multinational enterprises (MNEs) are more likely to be run by managers who have previous experience in episodes of multinational (MN) entry at other firms. Second, MNEs are riskier than domestic firms. We establish this fact by looking at both risk premia and risk exposure across firms with different multinational status. Multinationals firms have systematically higher expected excess returns (i.e., higher risk premia) than domestic firms. Surprisingly, this is true even prior to MNE entry. Moreover, current and future MNEs have higher loadings on aggregate risk factors than domestic firms (i.e., higher risk exposure). Third, we find that managers' characteristics contribute to explain MNEs' risk premia and risk exposure. We believe that this is the first paper that shows the systematic relationship between managers' experience, firms' multinational presence, and risk.

To rationalize these novel empirical patterns, we nest a dynamic model of foreign direct investment into a standard consumption-based asset pricing model. In the model, the aggregate source of risk is given by fluctuations in the agents' stochastic discount factor. Firms are heterogeneous in productivity and in the experience of their manager. Depending on the realizations of the shocks, firms may decide to engage in FDI. Consistently with the empirical evidence that we find, we assume that firms that are managed by experienced CEOs have lower fixed costs of multinational expansion. For this reason, productivity and managemerial experience jointly drive selection into FDI. In addition, heterogeneity in managerial experience affects the firms' operating leverage, driving heterogeneity in firm exposure to aggregate risk and, hence, heterogeneity in expected returns. The model is also able to explain the observed differences in expected returns between domestic firms and future multinationals, thanks to the effect that managerial experience has on the option value of FDI.

In the model, firm-level risk premia coincide with firm-level expected returns in excess of the risk-free rate, and are driven by the covariance of changes in the value of the firm with the stochastic discount factor. In our empirical analysis, we measure risk premia with long-run average excess stock returns, or the reward stock-holders require to bear the risk associated with holding shares of a firm, also in excess of the risk-free interest rate.

Our model predicts a positive correlation between managerial compensation, managerial experience, and firm multinational status. We exploit the implications of the model for managerial compensation in a quantitative analysis that studies the effects of distortions to the market for managerial talent for selection into FDI and aggregate real and financial market outcomes. Our results suggest that taxing firms with high CEO pay (a measure that has been proposed and is currently being discussed in the US Congress) may prevent firms' efficient entry into foreign markets, reduce the gains from openness, and skew the firm distribution composing the market portfolio, with ambiguous effects for aggregate risk.

Our analysis is made possible by a novel data set derived from a combination of sources. We combine firm-level data from Compustat and from the Center for Research on Security Prices (CRSP) with deal-level data from the Thomson Reuters Mergers & Acquisitions database. CRSP contains data on our dependent variable of interest, the stock returns of the firm, our measure of risk premium. Compustat has accounting data that allow us to control for many firm characteristics. We recover information about the multinational status of the firm from the SEC 10-K filings using a textual analysis algorithm that identifies the existence and location of each firm's foreign subsidiaries. We then match these data to the Thomson Reuters Mergers and Acquisitions data so that we can accurately observe episodes of multinational expansion through international acquisitions. We complement the firm-level data sets with data from Execucomp and Boardroom Alpha, which track the CEOs of a sub-sample of publicly listed firms, and with the World Management Survey (henceforth, WMS), which contains indicators of management quality for a small subset of our sample.

Our data are unique in that they allow us to compare a firm's characteristics before and after its first episode of multinational entry. Moreover, they allow us to track MNE expansion by country and whether it happens via an acquisition or via greenfield investment.

This paper contributes to the literature at the intersection of international economics, asset pricing, and corporate finance. There is a growing literature studying the relationship between risk, stock returns, and firms' international activities. De Sousa et al. (2020), Esposito (2020), and Heiland (2020) study export decisions in risky environments. Barrot et al. (2019) and Bianconi et al. (2020) link measures of globalization and trade policy to asset prices. The analysis of the decisions of MNEs under conditions of risk is inherently more complex, as it involves decisions about the location of production. International macro analyses of the risk implications of multinational production are featured in Rowland and Tesar (2004) and Ghironi and Wolfe (2018). Ramondo and Rappoport (2010) study MNEs' location decisions in a risky environment. By exploiting cross-sectional variation across firms, Fillat and Garetto (2015) document stock return differentials among multinationals, exporters, and domestic firms. Using detailed data on the distribution of MNE sales across countries, Fillat et al. (2015) show that MNEs operating in countries that are costlier to enter and whose GDP growth covaries more with the GDP growth of the origin country have higher stock returns compared with MNEs operating in countries that are easier to access and have less correlated GDP growth. This paper contributes to this line of work by investigating the relationship between management, multinational activity, and stock returns.

Our analysis is related to a large empirical literature in finance focusing on anomalies or regularities in the cross section of expected returns that cannot be rationalized by theoretical models. The seminal work in Fama and French (1993) present evidence on the relation between firm stock returns, aggregate market returns, book-to-market ratios, and market value. They find that market *betas*—the slope of a regression of individual stock returns on the aggregate market return—are not sufficient to describe the cross section of returns. This suggests that there is more than one source of aggregate risk. The extensive literature generated by this finding cannot be adequately summarized here. Our paper's analysis aligns more closely

with subsequent studies, such as Berk et al. (1999) and Gomes et al. (2003), which explore the implications of production and investment on the cross section of returns and argue that firms' exposure to a single systematic source of risk does explain the cross-sectional differences but only conditional on the firm's life cycle. The results in Berk et al. (1999) rely on the difference between assets in place and growth options, and Gomes et al. (2003) account for cross-sectional differences in firm productivity in addition to differences in growth options. These papers establish a negative relationship between productivity and stock returns, conditional on firm size. In our model, the relationship between productivity and stock returns is further modulated by the role of management style and foreign investment.

Lastly, our emphasis on management as an important characteristic driving firm status and stock returns links this paper to the management literature. Several papers examine the relationship between management and firm performance using the World Management Survey, most notably, Bloom and Van Reenen (2007), and Bloom et al. (2013). Our emphasis on risk premia, however, makes our paper closer to contributions in finance. Bertrand and Schoar (2003) investigate how individual managers affect corporate behavior and performance, and Schoar et al. (2020) study their effect on firm's exposure to systematic risk. To deepen our understanding of the properties of management that are driving firm outcomes, Malmendier and Tate (2008) highlight the role of managerial overconfidence. Our paper contributes to this line of research by finding that managers may affect both the risk exposure of a firm and also its likelihood of engaging in FDI, especially through their past experience in transformational events like multinational expansion.

2 Data

Our data set derives from combining several sources: the linked CRSP-Compustat data, the 10-K files, Execucomp, and Boardroom Alpha, which contain information about firm management. For robustness check, we also use information from the Thomson Reuters Mergers & Acquisitions database, and the World Management Survey.[1] Our sample period spans 25 years, from 1993 through 2017.[2]

The linked CRSP-Compustat dataset contains quarterly accounting data and monthly stock returns of publicly listed firms in the United States, providing a comprehensive picture of firms accounting data over a long period of time. CRSP/Compustat, however, has no information on firms' international activities. We recover information about each firm's exposure to international markets from the firm's SEC 10-K filings, which firms with publicly traded securities are required to file annually by the Securities and Exchange Commission (SEC). More precisely, we extract data from the text of each firm's Exhibit 21, a document that lists the firm's set of significant subsidiaries and the countries where they are located.[3] We define

[1] See Bloom et al. (2013) for a description of the survey.

[2] The start of the sample period is motivated by the fact that the coverage of the Boardroom Alpha data is better in more recent years.

[3] The 10-k data include both direct and indirect subsidiaries into the Exhibit 21. Inclusion in the data is determined by a reporting threshold based on the ratio of sales/assets, not on ownership share. Precisely, firms must report subsidiaries that represent at least 10% of consolidated assets or 10% of consolidated income. Appendix A contains details of the textual analysis

Table 1: Firm Count by International Status

	N. of Firms
Always Domestic Firms	4,937
Always Multinational Firms	2,846
New MNE Acquirors	729
New Greenfield MNE	2,089
Other Firms	1,382
Total Firms	11,983
Total Acquiring Firms	8,123

Note: *New MNE acquirers* are firms that enter the sample as domestic firms and later acquire a foreign firm and their 10-K filings simultaneously start reporting a foreign subsidiary. *New Greenfield MNE* are firms that change their multinational status according to the 10-K filings but don't undertake foreign acquisitions. *Other firms* are those firms that enter the sample as MNEs and later appear as domestic according to the 10-K filings. Source: CRSP/Compustat, Thomson Reuters M&A, and SEC 10-K filings.

a firm as a *multinational* in a given year if it reports the existence of foreign affiliates in its Exhibit 21. Alternately, we define a firm as *domestic* in a given year if its Exhibit 21 does not report the existence of foreign subsidiaries.[4] The resulting merged sample contains data for 11,983 firms, among which 41.2 percent don't report any foreign subsidiaries at any point in time (*always domestic* firms), while 23.8 percent report the existence of foreign affiliates every year they are present in the sample (*always MNEs*).[5] The remaining firms exhibit changes in international status during their life: we define as *new MNE acquirers* those firms that enter the sample as domestic and gain exposure to foreign markets via a merger with or an acquisition of a foreign firm.[6] We infer that the firms entering the sample as domestic and later reporting the existence of foreign affiliates, without an acquisition, must have established that affiliate afresh. We call these firms *new greenfield MNEs* to indicate their type of MNE entry. We use the term *other firms* to refer to firms that enter the sample as MNEs but stop reporting the existence of foreign affiliates later in their life. Table 1 reports firm counts for these different groups.

In our sample, foreign affiliates are located in 169 countries. The resulting geographic distribution of FDI activity is comparable to those of other data sets, including the Bureau of Economic Analysis data on the operations of multinational enterprises.[7] It is worth noting that our merged data set is unique in its

procedure and examples of the information contained in Exhibit 21.

[4]Non-multinational firms could also be exposed to foreign markets through exports. In a robustness exercise, we performed all the empirical analysis contained in this paper after dropping from the sample all firms that report exports but not foreign affiliates at any point in time. The results, available upon request, are qualitatively unchanged compared with the baseline specification.

[5]These numbers reveal the selection of firms populating the Compustat sample: since the data set contains only publicly listed firms, only the largest firms in the economy are represented, so the share of multinationals is much higher than in the entire population of firms.

[6]The Thomson-Reuters data provide global information about acquisitions, including acquisitions in which the acquirer is headquartered in the US, and the target in a foreign country. We merge the Thomson-Reuters data with CRSP-Compustat using the historical firm CUSIP.

[7]See Appendix Figures B.1 and B.2. Garetto et al. (2021) report the same sorting properties of FDI destinations for US MNEs using the BEA data.

capacity to identify US firms' entry into multinationality.[8] The information contained in the 10-K affiliate reporting informs us about the extensive margin of multinationality, on aggregate and by foreign country.

We augment our firm-level data with management information by merging in CEO-firm pairs obtained from Execucomp and Boardroom Alpha. These data sets track several levels of executive-firm pairs. We focus on the CEO as an important driver of the decisions that are relevant to our paper: firm expansion into foreign countries. 22.6% of firms in our sample have information about the identity of their CEO. There is a lot of variation in terms of the involvement of different firm-manager pairs in MNE activity: 21.6% of managers in our sample oversaw their firm's transition into multinationality.

Finally, we perform some robustness exercises using a smaller sample of firms which exploits the information contained in the World Management Survey. The WMS offers additional data on management practices.[9] We use the aggregate score of management practices for the subset of surveyed firms that are headquartered in the United States and are publicly traded. We successfully match 238 firms to our Compustat sample.

2.1 Summary Statistics

We measure firm-level risk premia with long-run average stock returns.[10] The international exposure of a firm is measured by its multinational status. In this section, we provide summary statistics of the main variables of interest, breaking down the sample into subgroups according to the firms' multinational status.

Table 2 reports summary statistics of firm-level stock returns by firm type. A comparison of mean and median returns across groups shows that i)MNEs have on average higher returns than domestic firms (consistent with Fillat and Garetto, 2015); and ii) new MNEs (either through M&A or greenfield investment) have higher returns than firms that are MNEs throughout the entire sample period. Interestingly, the groups that present higher mean and median returns also tend to have lower standard deviations of returns: the returns of new MNEs tend to be higher *and* less volatile than the returns of other firms. The return differentials shown in Table 2 are robust to the inclusion of size controls and industry-quarter fixed effects.

Table 3 reports summary statistics of size measures of the firms in our sample together with firm and acquisition counts. The table confirms the well-known fact that MNEs are larger than domestic firms in terms of sales, employment, and market capitalization.

[8] Most empirical analyses of US MNEs use the affiliate-level data from the Bureau of Economic Analysis (https://www.bea.gov/surveys/diasurv), which is a sample including only MNEs, hence it does not allow us to observe these firms *before* their entry into multinationality.

[9] The survey methodology is described in detail in Bloom and Van Reenen (2007). Each surveyed firm provides scores for different management practices for each firm. The management score is an aggregation of practices related to operations management, performance monitoring, target setting, leadership management, and talent management.

[10] Stock returns are defined as one-year capital gains plus dividend yields: $R_{t+1} = (p_{t+1} + d_t)/p_t$, where p_t denotes the price of a share and d_t the dividends per share at time t. We identify firm-level returns with the returns of the firm's common equity. We compound monthly returns to the annual level for the summary statistics and to the quarter level for the regressions in Section 3.

Table 2: Annualized Quarterly Returns by Firm Type.

	Mean	Median	Standard Dev.
Always Dom.	4.37	5.05	16.88
Always MNE	5.31	5.91	15.89
New MNE	7.14	6.77	10.60
Other Firms	6.71	6.35	11.52

Note: Firms missing all quarterly returns are dropped. Source: CRSP/Compustat, Thomson Reuters M&A, and SEC 10-K filings.

Table 3: Firm Characteristics by Firm Type.

	Revenue (USD Million)	Employees (Thousands)	Mkt. Cap. USD Million	Nr. of Firms	Acquisitions Dom.	For.
Always Dom.	86.37	1.60	470.67	4896	12290	0
Always MNE	745.48	9.89	4530.42	2823	14092	7117
New MNE	311.98	5.06	1426.06	2732	17859	2820
Other Firms	334.18	5.65	1517.42	1381	7080	2198

Note: Firms missing all quarterly returns are dropped. Source: CRSP/Compustat, Thomson Reuters M&A, and SEC 10-K filings.

3 Empirical Analysis

In this section we establish three empirical findings: 1. Multinational enterprises are more likely to be run by managers with previous experience in multinational expansion; 2. Current and future MNEs are riskier than domestic firms. 3. Managers' characteristics contribute to explain MNEs' risk premia and risk exposure. The uniqueness of our merged data, which contains information about firms' characteristics, international presence, and identity of the managers, allows us to explore the three dimensions simultaneously. Our first objective is to determine whether and how CEOs play a role in the firms' decision to enter foreign markets via FDI. We find that CEOs, and especially their prior experience in a domestic-to-multinational transition, increase the likelihood of a domestic firm becoming multinational. Previous work has shown that multinationals exhibit higher expected returns than domestic firms as a result of higher risk exposure. Surprisingly, we find that the selection of domestic firms that become multinational at a future point in our sample exhibit higher returns than the set of domestic firms that remain domestic for the entirety of our sample. And finally, tying the two facts together, we find that CEO characteristics contribute to explain the higher expected returns of domestic firms that eventually become multinational.

3.1 Management and Firm Expansion

There is a large empirical literature documenting the role of managers and managerial practices for various aspects of firm performance.[11] Inspired by this literature, we explore the role managers play in determining firms' expansion. Our primary measure of firm expansion is entry into foreign markets via foreign affiliates (firms becoming MNEs).

To provide new evidence on the role of managers for multinational entry, we run the following regressions:

$$M_{it} = \alpha + \gamma X_{it} + \delta_{NAICSt} + \delta_i + \delta_m + \varepsilon_{it} \quad (1)$$

$$M_{it} = \alpha + \beta \exp_{mt} + \gamma X_{it} + \delta_{NAICSt} + \delta_i + \varepsilon_{it}. \quad (2)$$

The left-hand side variable M_{it} is a "MNE dummy" taking value 1 if firm i reports having foreign affiliates in quarter-year t. The main explanatory variables of interest are related to the role of managers in determining multinational status. Equation (1) represents a linear probability model where we examine the contribution of a battery of fixed effects in explaining variation in multinational status across firms. In particular, we include both firm fixed effects, δ_i, and manager fixed effects, δ_m, to identify changes in multinational status within firms that change manager over their life. In equation (2), we replace the manager fixed effects with measures of managerial experience, $\exp_{mt}$. Our measures of managerial experience leverage the information that our data make available about the employment history of the managers. In particular, we look at managers' previous experience in firm expansion episodes: $\exp_{mt}$ denotes a dummy taking value 1 if the manager had previous experience guiding a firm through a transition from domestic to multinational, or reports the number of countries where the manager opened affiliates while working at previous firms.

Both specifications include among the explanatory variables a vector of time-varying firm-level controls X_{it} including capital/labor ratio, sales per employee (our measure of productivity), measures of size (such as total revenues and market capitalization), leverage, the firm annual market *beta*,[12] and industry-quarter fixed effects.

The results of these regressions are shown in Table 4. Columns (1)-(4) show the fixed effects results (equation (1)). The comparison of the adjusted R^2 across columns (1)-(4) shows that manager fixed effects significantly contribute to explaining a firm's choice to engage in multinational activity, more than 4 percent beyond what firm characteristics and industry-time trends explain. This contribution is sizeable, considering that the identification is obtained from managers that have worked at a minimum of two firms in our sample.

[11] Bloom et al. (2013) illustrate the existence of a relationship between good managerial practices and multinational activity: they show that multinational corporations achieve consistently higher management scores in the WMS compared with domestic firms, regardless of their location or country of incorporation.

[12] The market *beta* of the primary security of firm i captures the comovement of the firm's excess returns with the aggregate excess market returns. We computed yearly market *betas* at the firm level by running regressions of daily individual security returns on the market aggregate returns (NYSE, AMEX, and Nasdaq) for each year firm i present in our sample. The risk-free rate is the yield on the three-month US Treasury Bill. The purpose of adding the market *betas* is to control for each firm's individual exposure to aggregate market risk. Results are robust to alternative ways to compute firm-level betas (e.g., at the quarterly level or annual rolling windows).

Table 4: Becoming a Multinational: Management Matters

VARIABLES	(1) Lin. Prob.	(2) Lin. Prob.	(3) Lin. Prob.	(4) Lin. Prob.	(5) Lin. Prob.	(6) Lin. Prob.	(7) Probit	(8) Probit
Previous MNE transition experience					0.113***		0.079***	
					(0.013)		(0.011)	
Number of country entries						0.001***		0.015***
						(0.000)		(0.001)
Observations	125,145	125,145	125,145	125,145	125,145	125,145	125,145	125,145
Adjusted R-squared	0.149	0.705	0.747	0.760	0.705	0.705		
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry-Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes		
Firm FE	No	Yes	No	Yes	Yes	Yes		
Executive FE	No	No	Yes	Yes	No	No		
Adj. Within R-squared	.048	.003	.002	.003	.004	.003		
F-test FE		p< 0.0001	p< 0.0001	p< 0.0001	p< 0.0001	p< 0.0001		
Pseudo R-squared							0.076	0.077

Note: The dependent variable is a dummy taking a value of 1 if a firm is a multinational in quarter-year t. All specifications include market capitalization, leverage ratio, sales per employee, capital per employee, and the firm beta as controls, and industry-quarter fixed effects. Columns (1)-(6) present a linear probability model to include fixed effects. Columns (7)-(8) report the marginal effects of a probit specification. Robust standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Source: CRSP/Compustat, SEC 10-K filings, Execucomp, Boardroom Alpha.

In columns (5)-(6) of Table 4, we dispense of the manager fixed effects, but add measures of managerial experience to the controls. The table shows that both definitions of managerial experience are positively correlated with the current multinational status of the firm.[13] Moreover, since the regressions include firm-fixed effects, coefficients are identified from firms that change manager during the sample period. Precisely, a domestic firm that is managed by a CEO who has prior experience in expanding a domestic firm beyond domestic borders has an 11.3 percentage points higher probability of becoming multinational compared with a domestic firm managed by a manager without such experience. In column (6), the definition of experience has an intensive margin component. For every country that the manager has expanded into in their previous jobs as CEO, the probability of becoming multinational increases by 0.1 percentage points.

Columns (7)-(8) of Table 4 dispense of the fixed effects altogether and show the results of a probit model. The coefficients on the measures of experience are positive and significant also in this specification.

Lastly, the role of managerial practices for multinational activity is also confirmed by a probit regression run on the smaller WMS sample: managerial practices are positively correlated with and contribute to explaining a firm's multinational status, as shown in Appendix Table C.3.

What is the mechanism whereby experienced managers increase the likelihood that a firm engages in FDI and M&A? To answer this question, we investigate the relationship between managers' characteristics and the firms' fixed costs. Table 5 shows that manager fixed effects contribute to explain variation in firm-level fixed

[13] In the table, we report the marginal effects. In the interest of space, Table 4 does not report the estimates for the controls. Appendix Tables C.1 and C.2 report the full results of regressions (1)-(**??**). Table C.2 also includes robustness to alternate definitions of managerial experience.

Table 5: Managerial Experience is Negatively Related to Firm Fixed Costs

	(1)	(2)	(3)	(4)	(5)	(6)
MNE	1.209***	0.186***	0.204***	0.161***	1.213***	1.205***
	(0.016)	(0.008)	(0.006)	(0.006)	(0.016)	(0.016)
Manager with previous MNE entry experience					0.549***	
					(0.086)	
MNE x Manager with previous MNE entry experience					-0.463***	
					(0.096)	
Number of country entered by current manager at previous firms						0.070***
						(0.011)
MNE x Number of country entered by current manager at previous firms						-0.040***
						(0.011)
Executive FE	No	Yes	No	Yes	No	No
Firm FE	No	No	Yes	Yes	No	No
Observations	95,579	94,787	95,376	94,758	95,579	95,579
Adjusted R-squared	0.462	0.965	0.954	0.971	0.462	0.464

Note: The dependent variable is firm-level fixed costs, measured as "Selling, General and Administrative Expense". The variable "Manager with previous MNE entry experience" takes the value of 1 if the manager has prior experience in transitioning a firm from domestic to MNE. "Number of countries entered by current manager at previous firms" denotes the number of countries where MNEs established new affiliates under the manager's leadership. All specifications include market capitalization, leverage ratio, sales per employee, capital per employee, and the firm beta as controls, and industry-quarter fixed effects. Robust standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Source: CRSP/Compustat, Thomson Reuters M&A, SEC 10-K filings, Execucomp, Boardroom Alpha.

costs.[14] In addition, while MNEs tend to have higher fixed costs than non-multinational firms, consistent with what the theoretical literature posits (see, among others, Helpman et al., 2004), managerial experience is negatively correlated with the fixed operating costs of MNEs, as the negative signs in the interaction coefficients of columns (5) and (6) of Table 5 indicate. This is an important finding for two reasons. Firstly, operating leverage is a considered a source of risk exposure in the finance literature, and therefore can impact the cross section of returns. And secondly, fixed costs play a crucial role in the engagement of firms in multinational activities. Interestingly enough, the interaction coefficients are not significant for other measures of experience, such as CEO age or CEO experience in M&A activity in prior firms, highlighting the relationship between managers' ability to reduce fixed costs and the specific experience that managers had in bringing a domestic firm into foreign markets through FDI. Building on this evidence, in our model, we assume that managerial experience affects the fixed costs of foreign operations.

[14] We measure firm-level fixed costs with the variable "Selling, General and Administrative Expense". The variable description in Compustat reports that *"this item represents all commercial expenses of operation (i.e., expenses not directly related to product production) incurred in the regular course of business pertaining to the securing of operating income"*. Since Compustat does not report separate accounting data for a firm's headquarters and its subsidiaries, this measure should be interpreted as describing the total fixed costs of the entire corporation.

3.2 Multinational Premia

We follow two complementary approaches to establish the relationship between firms' multinational status and risk. First, we study the role of firm characteristics on expected returns.[15] We take expected returns as a measure of risk because, keeping everything else constant, riskier investments should have higher expected returns than safer investments under standard risk aversion specifications. The firm characteristics we use to explain stock returns include indicators of multinational activity, among others. Second, we examine whether the covariance of these characteristics with aggregate risk factors drives the risk premia of multinational firms. This analysis takes the form of portfolio regressions in which the construction of the portfolios is based on multinational status.

3.2.1 Characteristics Regressions

To identify a cross-sectional correlation between a firm's multinational status and its stock returns, we regress firm-level returns on MNE dummies and on a set of firm characteristics, following an approach similar to Fillat and Garetto (2015).

In this specification, we acknowledge that multinational activity is an endogenous choice of the firm, and our data allow us to identify the time when firms start operating abroad. We take advantage of this dimension of the data to investigate whether multinational firms exhibit higher returns than domestic firms also prior to their engagement in foreign markets. To do so, we examine the stock returns of both *current* and *future MNEs*, where we define future MNEs as firms that have been domestic up to a given point in time but will become MNEs in future periods. We compare the stock returns of current and future MNEs with the stock returns of firms that are domestic for the entire sample. To do so, we regress:

$$ret_{it} = \alpha + \beta_m M_{it} + \beta_f [1 - M_{it}] \cdot \max_{\tau > t} M_{i\tau} + \gamma X_{i,t} + \delta_{NAICSt} + \varepsilon_{it}, \tag{3}$$

where the dependent variable ret_{it} denotes the stock returns of firm i in quarter t, M_{it} is a dummy variable that takes a value of 1 if firm i is an MNE at time t, and $M_{i\tau}$ is a dummy variable that takes a value of 1 if firm i is not an MNE at time t, but will become an MNE at some future time $\tau > t$. The other controls have been defined in the previous section. The coefficient of the MNE dummy, β_m, identifies the cross-sectional differential stock returns of multinational firms compared with domestic firms within an industry-quarter bin, while the coefficient β_f measures the additional returns that firms that are not currently MNEs, but will be at some point in the future, carry over always domestic firms (the excluded category). To correct for the fact that the number of future MNEs decreases by construction toward the end of our sample period, we run the regression using data for the first half of the sample only: $t = 1993, ...2005$, so that τ can go up to 12 years after t.

[15] We proxy expected returns with long-run average stock returns in the data.

Table 6: Returns of Future MNEs

VARIABLES	(1)	(2)
Current Multinationals	0.529**	0.496**
	(0.224)	(0.247)
Future Multinationals	1.328***	1.249***
	(0.255)	(0.280)
Acquirer	2.373***	2.263***
	(0.272)	(0.283)
Market Capitalization	1.858***	1.833***
	(0.081)	(0.084)
Leverage Ratio	-1.236***	-1.030***
	(0.254)	(0.291)
Sales/Employee	0.001	0.001*
	(0.000)	(0.001)
Capital/Employee	-0.000**	-0.000**
	(0.000)	(0.000)
Beta (Annual)	-0.081	-0.131
	(0.189)	(0.201)
Constant	0.948***	0.952***
	(0.187)	(0.234)
Observations	78,300	68,411
Adjusted R-squared	0.139	0.142
Current Minus Future MNE p-Val	.001	.002
Executive FE	No	No
PSM	No	Yes

Note: The dependent variable is quarterly firm-level annualized stock returns. Controls include market capitalization, leverage ratio, sales per employee, capital per employee, and the firm *beta*. All specifications include industry-quarter fixed effects. The sample excludes "Other MNEs" or firms that enter the sample period as MNEs and later switch to only domestic operations. Column (2) features a propensity score-weighted control group. Robust standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Source: CRSP/Compustat, Thomson Reuters M&A, and SEC 10-K filings.

The results in Table 6 show that multinational firms exhibit significantly higher returns compared with domestic firms, consistent with what Fillat and Garetto (2015) show for the manufacturing sector. In addition, Table 6 indicates that, prior to MNE entry, future MNEs already had higher returns when compared with domestic firms. In our baseline specification (column 1), the premia for current and future MNEs are both sizeable, and they are statistically different from each other. Interestingly, the premium associated with future MNEs is even higher than the one associated with current MNEs. For robustness, the specification in column 2 uses a propensity-score-matching procedure to restrict the sample by using a subset of domestic (untreated) firms that are comparable to the current and future MNEs.[16] The results are analogous to the

[16]For the propensity-score-matching regression, we first compute a logistic regression for the treatment (current MNE) probabilities as a function of firm characteristics. Each treated firm is matched with the untreated firm that has the highest propensity scored. These matched firms are used in the regression (3), along with the treated firms.

baseline specification. The industry-quarter fixed effects absorb industry- and time-specific aggregate risk factors that affect all firms in a given quarter, so we can interpret the estimates on the dummies and firm characteristics as the marginal effects on risk-adjusted returns.

3.2.2 Portfolio Regressions

We complement the characteristics regression with a more common approach in the finance literature to show evidence about current and future MNEs' exposure to systematic risk. As first introduced by Fama and French (1993), firm characteristics may be proxies for non-diversifiable factor risk.[17] We follow a simple approach in which we form portfolios based on multinational status to estimate portfolio covariances with systematic risk factors as drivers of risk premia. In these portfolio-level regressions, we explore the source of the multinational premium by estimating the portfolio loadings on non-diversifiable factor risks. Higher average returns in the cross section do not constitute a puzzle per se; they simply indicate that MNEs are riskier than domestic firms. We adopt a classic asset pricing interpretation and view the risk exposure of a firm as reflecting a higher covariance of its stock returns with financial-market risk factors.

We build portfolios based on time-invariant MNE status categories. The returns of each portfolio are given by the market capitalization-weighted average of the stock returns of the firms in the portfolio. For each portfolio, we run one time-series regression of returns on the Fama-French factors.[18] The results are displayed in Table 7.

The risk to which multinationals are exposed, and the corresponding higher returns they provide to investors, are partially explained by higher market *betas*: the portfolios formed by multinational corporations exhibit higher market *betas* compared with the portfolios of domestic firms. Interestingly, this is true for both current and future MNEs.

These results suggest that multinational firms' stock returns co-vary more with systematic risk factors, especially with the aggregate US stock market, than domestic firms. This evidence motivates the structure of the model in Section 4, in which firms' cash flows are exposed to an aggregate source of risk.

[17] In Fama and French (1993), the firm characteristics are related to size and value relative to fundamentals (book value divided by market value).

[18] The CAPM model explains higher returns of certain assets as being generated by a larger covariance with systematic risk, represented by the returns on the aggregate market portfolio. Fama and French (1993) introduced a multifactor extension of the original CAPM that explains a high portion of the variation in expected returns. Higher returns must be explained by higher exposure to either of these three factors: market excess returns, high-minus-low book-to-market, or small-minus-big portfolio, as these characteristics seem to provide independent information about average returns. The small-minus-big (SMB) and high-minus-low (HML) factors are constructed on six portfolios formed on size and book-to-market. The portfolios are the intersection of two portfolios formed on size (small and big) and three portfolios formed on book equity to market equity (from higher to lower: value, neutral, and growth.) This generates six portfolios: small-value, small-neutral, small-growth, big-value, big-neutral, and big-growth. SMB represents a portfolio formed by going long on the three small portfolios and short on the three big portfolios. HML is a portfolio formed by going long on the two value portfolios and short on the two growth portfolios. For more details, see Fama and French (1993). Therefore, any asset is represented as a linear combination of the three Fama-French factors. We enlarge the set of factors by considering the excess returns on an international market portfolio that serves as a market benchmark for firms with foreign operations. Data on the excess returns on this global market portfolio are obtained from Kenneth French's data library on international indexes, http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/Data Library/int index port formed.html.

Table 7: Fama-French Portfolio Regressions: MN status

	Always Domestic	Future MNEs	Always MNEs
β_{MKT}	**0.821*** **	**1.011*** **	**0.976*** **
	(0.031)	(0.033)	(0.019)
β_{HML}	0.435***	0.226***	-0.157***
	(0.045)	(0.047)	(0.028)
β_{SMB}	0.388***	0.349***	-0.126***
	(0.034)	(0.036)	(0.021)
Constant	0.011***	0.010***	0.010***
	(0.001)	(0.001)	(0.001)
Observations	156	156	156
Adjusted R-squared	0.841	0.889	0.958

Note: The dependent variable is the market capitalization-weighted average of the stock returns of firms in each portfolio at a monthly frequency. Sample years 1993-2005. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1
Source: CRSP/Compustat and SEC 10K filings.

3.3 Managers and Firm Risk

Finally, we examine the role that manager characteristics have in explaining multinational firms' risk premia. In order to do so, we follow the approach in Bertrand and Schoar (2003) and augment our regressions with information about firms' CEOs. Importantly, as the match of our dataset with CEO information from Boardroom Alpha and Execucomp is not perfect, this exercise is run on a smaller sample of mostly larger firms when compared to the one in the previous section, which contains all the firms in Compustat.

3.3.1 Characteristics Regressions

Table 8 shows the results of the characteristics regressions. We report a version of the table where the only controls are the MNE dummies and the fixed effects in order to avoid polluting our results with "bad controls". Appendix Table C.4 reports the results of the regression including the full set of controls X_{it}.

Column (1) of Table 8 shows the current and future multinational premia on the smaller sample with executive information. It is important to notice that by including only firms at the very top of the size distribution, this sample features less heterogeneity than the sample in the baseline results.

The addition of manager fixed effects in column (2) increases the explanatory power of the regression, indicating that managers contribute to explain variation in stock returns across firms. In addition, when controlling for manager fixed effects, the coefficients on the MNE dummies are not statistically different from zero, suggesting that managerial characteristics contribute to explain the higher expected returns of current and future multinationals compared to domestic firms. However, since in this specification the identification comes from firms that change manager during the sample period, the sizable increase in the size of the coefficients implies that –on average– the stock returns of current and future MNEs increase as they change

Table 8: Returns of Future MNEs: Management Matters

	(1)	(2)	(3)	(4)
Current Multinationals	0.771**	3.252	-1.726***	-1.734***
	(0.360)	(3.992)	(0.607)	(0.648)
Future Multinationals	1.424***	4.966		
	(0.411)	(3.979)		
Constant	4.526***	2.317	6.287***	6.308***
	(0.302)	(3.189)	(0.374)	(0.396)
Firm FE	No	No	Yes	Yes
Executive FE	No	Yes	No	Yes
Observations	31,040	30,697	30,892	30,687
Adjusted R-squared	0.175	0.185	0.185	0.185
Current Minus Future MNE p-Val	.065	.008	.004	.007

Note: The dependent variable is quarterly firm-level stock returns. All specifications include industry-quarter fixed effects. The sample excludes "Other MNEs," or firms that enter the sample period as MNEs and later switch to only domestic operations. Robust standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Source: CRSP/Compustat, Thomson Reuters M&A, SEC 10-K filings, Execucomp.

manager.[19] It is important to notice that the specification in column (2) does not include firm fixed effects, as the two multinational status dummies, taken together, absorb all the variation contained in the firm fixed effects.

For completeness, columns (3)-(4) present the results including firm fixed effects and excluding the future MNE dummy. In this scenario, identification is driven by firms that change multinational status during the sample period. The negative coefficient on the current MNE dummy implies that returns decline when firms enter foreign markets, a feature that will be present in our model. Appendix Figure C.2 also confirms this finding by presenting the results of an event study specification conducted on the subsample of firms that become multinational through acquisition of foreign targets.

3.3.2 Portfolio Regressions

To provide further evidence on the effect of managers on firm risk exposure, we present an additional set of portfolio regressions where the portfolios are formed not only on multinational status but also on managerial experience.

Like in the previous section, we define a manager as "experienced" if she previously guided a firm through a transition from domestic to multinational. We build time-invariant portfolios based on the six combinations of MN status and managerial experience. Like in Table 7, the returns of each portfolio are given by the market capitalization-weighted average of the stock returns of the firms in the portfolio.

[19] This result is also consistent with the finding (not shown) that managerial turnover contributes to explain expected returns.

Table 9: Portfolio Regressions - MN status and managers' experience.

VARIABLES	(1) always DOM no prev. MNE	(2) always DOM prev. MNE	(3) future MNE no prev. MNE	(4) future MNE prev. MNE	(5) always MNE no prev. MNE	(6) always MNE prev. MNE
β_{MKT}	0.585***	0.569***	0.845***	0.937***	1.005***	0.907***
	(0.052)	(0.194)	(0.041)	(0.188)	(0.022)	(0.258)
Constant	0.012***	-0.008	0.013***	0.025***	0.008***	-0.001
	(0.002)	(0.009)	(0.002)	(0.009)	(0.001)	(0.012)
Observations	156	95	156	126	156	120
R-squared	0.455	0.085	0.737	0.167	0.934	0.095

Note: The dependent variable is the market capitalization-weighted average of the stock returns of firms in each portfolio at a monthly frequency. Sample years 1993-2005. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1
Source: CRSP/Compustat, SEC 10K filings, Execucomp, Boardroom Alpha.

The results are shown in Table 9. The comparison of columns (3)-(4) and (5)-(6) shows that managerial experience affects the loadings on the market portfolio of current and future MNEs. Conversely, columns (1)-(2) show that managerial experience makes little difference for the loadings of domestic firms. The effect of managerial experience on the loadings appears asymmetric depending on MN status: future (current) MNEs with experienced managers are more (less) exposed to the systematic risk factor than future (current) MNEs with unexperienced managers.[20]

The evidence we presented so far shows that managerial characteristics contribute to explain the multinational premium and are related to firm's risk exposure. The evidence we have shown about the effects of managerial experience on firm-level fixed costs and selection gives us confidence about a mechanism whereby managerial experience has an effect on firms' decisions. In the structural model that follows, we will link the observed relationship between managerial experience and firm expansion to stock returns.

4 Model

In this section, we propose a simple model where managers' role for firm expansion rationalizes the higher risk premia and risk exposure of MNEs that we observe in the data.

In the model, firms are heterogeneous in productivity and in the type of manager they have, and choose whether to become MNEs.

The results of our Fama-French regressions in Table 7 show that stock returns are linked to firm-level exposure to aggregate factors. Consistent with this evidence, we assume that aggregate risk factors are

[20]To provide further support for the role of managers in affecting firm's systematic risk, Appendix Table C.5 follows the approach in Schoar et al. (2020) and examines the role of manager fixed effects in explaining the annual firm *betas* of firms with different international statuses. Table C.5 shows the F-test results of joint significance of time, firm, and CEO fixed effects in explaining firm-level *betas* for firms with different MN status, and the corresponding adjusted R^2. Our estimates indicate that manager fixed effects contribute to explain the systematic risk that current and future MNEs are exposed to.

reflected in the agents' intertemporal marginal rate of substitution, so that expected returns are higher the lower the covariance between the agents' stochastic discount factor (dM/M) and changes in the value of the firm (dV/V):

$$E(r) - r_f = -r_f \cdot Cov\left(\frac{dM}{M}, \frac{dV}{V}\right), \tag{4}$$

where $E(r)$ denotes the expected return of a firm, and r_f denotes the risk-free rate.

The asset pricing component of our model is a simple consumption-based CAPM model, where assumptions on preferences and risk aversion imply an expression for the stochastic discount factor dM/M. Changes in the value of the firm, dV/V, are endogenous and firm-specific, and depend on firms' FDI decisions.

4.1 Preferences, Technology, and Shock Structure

There are two countries, Home and Foreign, populated by agents with identical preferences:

$$U = \int_0^\infty e^{-\rho t} \frac{C(t)^{1-\gamma}}{1-\gamma} dt, \tag{5}$$

where $\rho > 0$ is the subjective discount factor, and $\gamma > 1$ denotes risk aversion. Variables related to the foreign country are denoted by an asterisk. The consumption level C is a CES aggregate of differentiated varieties:

$$C(t) = \left[\int c_i(t)^{\frac{\eta-1}{\eta}} di\right]^{\frac{\eta}{\eta-1}}, \tag{6}$$

where $\eta > 1$ denotes the elasticity of substitution across varieties.

Each country is populated by a continuum of heterogeneous firms. Each firm is characterized by its productivity level φ, and by its manager type m. The pair (φ, m) is drawn from an exogenous and time-invariant distribution $G(\varphi, m)$ at firm birth. Since each firm produces a unique variety, as it is customary in the literature, we can denote a variety by the characteristics of the firm that produces it, $c_i = c(\varphi, m)$.

Firms hire labor to produce output, and operate under monopolistic competition. The production function is linear in labor: $c(\varphi, m) = \varphi l$. Given CES demand, a firm's variable profits can be written as:

$$\pi(\varphi) = A\varphi^{\eta-1} C \tag{7}$$

where $A = \frac{1}{\eta-1}\left(\frac{\eta}{\eta-1}\right)^{-\eta}\left(\frac{1}{w}\right)^{\eta-1} P^\eta$, w denotes the wage, and P is the ideal price index: $P = \left[\int p(\varphi)^{1-\eta} d\varphi\right]^{\frac{1}{1-\eta}}$.

Firm managers do not directly affect output, but – consistent with the empirical evidence shown in Table 5 – we assume that they affect firms' fixed operating costs $f(m)$. This assumption implies that a manager is like a technology that the firm uses.

If a firm's characteristics (φ, m) are such that the firm makes non-negative profits, a firm operates in its

domestic market. In addition, by paying a sunk cost $F > 0$, a firm may become an MNE and have access to the foreign market as well. The FDI production technology is identical to the one in the domestic country, but it is subject to a higher fixed operating cost $f_I(m) > f(m), \forall m$.

The economy is hit by aggregate shocks, which we model as fluctuations in the aggregate consumption levels in the two countries. C and C^* are exogenously given and evolve according to:

$$\frac{dC}{C} = \mu dt + \sigma dz \tag{8}$$

$$\frac{dC^*}{C^*} = \mu^* dt + \sigma^* dz^*, \tag{9}$$

where $\mu, \mu^* \in \Re$, $\sigma, \sigma^* \in \Re_+$ and $E(dz, dz^*) = \chi dt$, where $\chi = \in [-1, 1]$ denotes the correlation between the two country-specific shocks. It follows that the stochastic discount factor is given by:

$$\frac{dM}{M} = -r dt - \gamma \sigma dz, \tag{10}$$

where $r = \rho + \gamma\mu - \gamma(\gamma + 1)\frac{1}{2}\sigma^2$.[21]

Like in Fillat and Garetto (2015), the correlation of shocks across countries χ is a source of diversification potential of MNEs, while the fixed costs of FDI drive firms' operating leverage. These two forces operate in opposite directions in determining the firms expected returns. On the one hand, diversification drives expected returns down. On the other hand, operating leverage results in higher risk as we explain below.

4.2 The Firm's Intertemporal Problem

A firm chooses its international status (domestic or multinational) to maximize the present discounted value of its profit flow, conditional on its productivity, manager type, and the realization of the aggregate shocks.

Let $\mathcal{V}(\varphi, m, C, C^*)$ denote the value of a firm with manager of type m and productivity φ when the realization of the aggregate shock is (C, C^*). Similar to Melitz (2003), we assume that the firm takes decisions in the two markets independently, so that we can write the value function as:

$$\mathcal{V}(\varphi, m, C, C^*) = V_D(\varphi, m, C) + \max\{V_F^o(\varphi, m, C^*), V_F(\varphi, m, C^*)\}, \tag{11}$$

where $V_D(\varphi, m, C)$ denotes the value of domestic activities, $V_F(\varphi, m, C^*)$ denotes the value of foreign activities for a firm which is currently a multinational, and $V_F^o(\varphi, m, C^*)$ denotes the option value of foreign activities for a firm that doesn't currently operate in the foreign market.

Bellman Equations. In the domestic market, a firm simply makes profits from domestic sales, so its

[21] The stochastic discount factor is equal to the agents' inter-temporal marginal rate of substitution. The marginal utility of consumption is: $M = e^{\rho t} C(t)^{-\gamma}$. By applying Ito's Lemma to M, one obtains equation (10).

value is given by its current profit flows plus the continuation value:

$$V_D(\varphi, m, C) = \pi(\varphi, C)M\Delta t - f(m) + \{E[M\Delta t \cdot V_D(\varphi, m, C')]\}, \tag{12}$$

where all flows are discounted with the agents' stochastic discount factor M, and C' denotes the realization of the shock at a future time $t + \Delta t$.

A firm that currently operates only in its domestic market must choose whether to start operating in the foreign market as well or to continue selling only domestically. For a domestic firm, foreign sales are an option that the firm exercises if it decides to become a multinational. Hence the option value of foreign sales is given by the maximum between its continuation value (in the event in which the firm decides not to exercise the option) and the value of foreign sales $V_F(\varphi, m, C^*)$ minus the sunk entry cost F (if the firm decides to exercise the option and become a multinational):

$$V_F^o(\varphi, m, C^*) = \max\left\{E[M\Delta t \cdot V_F^o(\varphi, m, C^{*\prime})], V_F(\varphi, m, C^*) - F\right\}. \tag{13}$$

Once it becomes a multinational, the firm also makes profits from foreign sales, so the value of foreign sales is given by the current foreign profit flow plus the continuation value:

$$V_F(\varphi, m, C^*) = \pi^*(\varphi, C^*)M\Delta t - f_I(m)M\Delta t + \left\{E[M\Delta t \cdot V_F(\varphi, m, C^{*\prime})]\right\}. \tag{14}$$

For simplicity, we assume that there is no exit from either the domestic or the foreign market.[22]

Value Functions. By using standard tools in the literature on investment under uncertainty (see K. Dixit and S. Pindyck, 1994), we can solve for the value functions in the continuation regions.

The value of domestic activities is given by the domestic profit flows, discounted by taking into account the evolution of the shock process and agents' risk aversion:

$$V_D(\varphi, m, C) = \frac{\pi(\varphi, C)}{r - \mu + \gamma\sigma^2} - \frac{f(m)}{r}, \tag{15}$$

where $\beta > 1$ is the positive root of the fundamental quadratic, $\frac{\sigma^2}{2}\beta^2 + \left(\mu - \gamma\sigma^2 - \frac{\sigma^2}{2}\right)\beta - r = 0$.

The solution for the value of existing foreign activities is analogous:

$$V_F(\varphi, m, C^*) = \frac{\pi^*(\varphi, C^*)}{r - \mu^* + \gamma\chi\sigma\sigma^*} - \frac{f_I(m)}{r}, \tag{16}$$

where $\beta^* > 1$ is the positive root of the fundamental quadratic, $\frac{\sigma^{*2}}{2}\beta^{*2} + \left(\mu^* - \gamma\chi\sigma\sigma^* - \frac{\sigma^{*2}}{2}\right)\beta - r = 0$.

[22]Introducing endogenous exit is conceptually straightforward, but implies a computational complication given by the fact that the value functions also include a term representing the option value of exit. The presence of this extra term doesn't change the intuition of the model, but prevents from deriving closed-form solutions.

Lastly, the option value of foreign activities is given by:

$$V_F^o(\varphi, m, C^*) = B^F(\varphi, m) C^{*\beta^*}, \tag{17}$$

where $B^F(\varphi, m)$ is the option value of becoming an MNE:

$$B^F(\varphi, m) = \frac{1}{\beta^*} \left[\left(\frac{\beta^* - 1}{\beta^*} \right) \left(\frac{r}{f_I(m) + rF} \right) \right]^{\beta^* - 1} \left(\frac{A\varphi^{\eta-1}}{r - \mu^* + \gamma\chi\sigma\sigma^*} \right)^{\beta^*}. \tag{18}$$

As it is standard with this class of models, value functions are given by the sum of the present discounted value of profits plus the option value of additional activities that the firm can undertake: FDI in this case. Examining the dependence of the option value (18) on φ reveals that more productive firms have a higher option value of multinational activity compared to less productive firms. Lastly, and importantly for the link between the model and our empirical analysis, since fixed costs decrease firm profits, the option value of becoming an MNE is decreasing in the fixed cost of FDI, $f_I(m)$.

Policy Function. Becoming an MNE is a discrete choice. Hence, the policy function is a firm-specific threshold in the realization of the aggregate foreign composite shock that induces the firm to enter the foreign market. More precisely, a firm becomes an MNE when $C^* \geq \bar{C}^F(\varphi, m)$, where $\bar{C}^F(\varphi, m)$ is determined by value matching and smooth pasting conditions between $V_F^o(\cdot)$ and $V_F(\cdot)$:

$$\bar{C}^F(\varphi, m) = \left(\frac{\beta^*}{\beta^* - 1} \right) \left(\frac{f_I(m) + rF}{r} \right) \left(\frac{r - \mu^* + \gamma\chi\sigma\sigma^*}{A} \right) \varphi^{1-\eta}. \tag{19}$$

The MNE entry threshold is decreasing in firm productivity φ, indicating that more productive firms need smaller positive demand shocks to enter foreign markets. The MNE entry threshold is also increasing in the fixed cost of FDI, $f_I(m)$, indicating that firms with lower fixed costs of FDI need smaller positive demand shocks to enter foreign markets.

Details on the derivation of the results in this section are contained in Appendix D.

4.3 Stock Returns

In the model, the expected excess returns of a domestic firm and of a multinational firm can be written as:[23]

$$E[ret_D(\varphi, m, C, C^*)] - r = \frac{\gamma\sigma^2 C V_D'(\varphi, m, C, C^*) + \gamma\chi\sigma\sigma^* C^* V_F^{0'}(\varphi, m, C, C^*)}{\mathcal{V}_D(\varphi, m, C, C^*)}) \tag{20}$$

$$E[ret_{MN}(\varphi, m, C, C^*)] - r = \frac{\gamma\sigma^2 C V_D'(\varphi, m, C, C^*) + \gamma\chi\sigma\sigma^* C^* V_F'(\varphi, m, C, C^*)}{\mathcal{V}_{MN}(\varphi, m, C, C^*)}.) \tag{21}$$

[23] The derivation of equations (20)-(21) is also contained in Appendix D.

Managers' characteristics affect the returns of both domestic firms and MNEs. Besides their effect on domestic sales, which is symmetric across firms, they affect the returns of domestic firms through the option value of becoming a multinational ($V_F^{0'}(\cdot)$, which contains the term $B^F(\varphi, m)$), and they affect the returns of MNEs through the value of their profit flows, which enters $\mathcal{V}_{MN}(\cdot)$. In the next section we will clarify the implications of manager type for expected returns.

4.4 Manager compensation

Firms take both wages and manager compensation as given as they decide their output level and FDI activity. For simplicity, we normalize wages in both countries: $w = w^* = 1$. In each period, a firm's total profits are split into dividends and managerial compensation using an exogenous, constant share rule: we assume that a portion d of firm's profits is distributed as dividend to the stockholders, while the remaining share $(1 - d)$ is the manager's compensation.[24]

As a result, manager compensation depends both on firm productivity and manager type: let $s(\varphi, m)$ denote the compensation of a manager of type m working for a firm with productivity φ.

4.5 Linking the Model to the Data

Our analysis so far has been silent on the interpretation to be given to the concept of manager type m. Managerial ability is not observable, forcing us to rely on measurable proxies to disentangle managers of different types.

Our empirical analysis differentiates managers by their experience in multinational firms. In particular, we define a manager as "experienced" if she guided a firm through multinational entry prior to the firm where she is currently employed. In Section 3, we have shown that MNEs that are run by experienced managers have lower fixed costs than MNEs that are run by less experienced managers. Consistently with this evidence, we assume that the fixed cost of FDI is lower for firms that are run by experienced managers: $f_I'(m) < 0$, where m denotes managerial experience.

5 Results: Management, Firm Status, and Stock Returns

We conclude our theoretical analysis by presenting three propositions that clarify the theoretical relationship between managerial experience, MNE status, and stock return, and provide an explanation for the facts shown in Section 3.

[24] This is analogous to Lucas (1978), where $d = 0$.

Proposition 1. $\frac{\partial \bar{C}^F(\varphi, m)}{\partial f_I(m)} \geq 0$. *Firms that are run by experienced managers are more likely to become MNEs. .*

Proof: Proposition 1 follows immediately by differentiating expression (19) with respect to $f_I(m)$.

Since the threshold to become a multinational, $\bar{C}^F(\varphi, m)$, is increasing in $f_I(m)$, keeping everything else equal, firms with experienced managers need smaller positive shocks to enter foreign markets, hence are more likely to and become MNEs. Model assumptions based on the empirical evidence on fixed costs (Table 5) deliver the selection of firms with experienced managers into multinational status that we observe in the data (Table 4).

We now examine the implications of managerial experience for the stock returns of domestic and multinational firms, respectively.

Proposition 2. *If* $\chi\sigma^* > \sigma$, *then* $\frac{\partial E(ret_D)}{\partial f_I(m)} < 0$. *Domestic firms run by experienced managers have higher expected returns than domestic firms run by inexperienced managers.*

Proof: Differentiating expression (20) and noticing that $\partial B_F(\varphi; m)/\partial f_I(m) < 0$, one obtains the result under the parameter restriction $\chi\sigma^* > \sigma$.

As Equation (18) shows, lower fixed costs increase the option value of FDI, increase the curvature of the value function, and hence its covariance with the stochastic discount factor, and the firm expected returns. Intuitively, domestic firms with a higher option value are more likely to exercise the option and become multinational. The stockholders forecast the higher likelihood of risky foreign operations, and command higher returns to be compensated for that risk.

Since firms that are run by experienced managers are more likely to become MNEs (Proposition 1), this result is consistent with the future MNE premia that we have shown in our empirical analysis (see Table 6): future MNEs (in the model, domestic firms with high option values of FDI), have higher returns than firms that sell only domestically.

Proposition 3. $\frac{\partial E(ret_{MN})}{\partial f_I(m)} > 0$. *MNEs run by experienced managers have lower expected returns than MNEs run by inexperienced managers.*

Proof: Proposition 3 follows immediately by differentiating expression (21) with respect to $f_I(m)$.

As Equation (16) shows, fixed costs decrease the value of a multinational firm. They also make the firm more exposed to negative shocks by increasing operating leverage (the mechanism highlighted in Fillat and Garetto 2015). An experienced manager, by reducing fixed costs, decreases the firm exposure to shocks and reduces the premium differential between MNEs and domestic firms.

Propositions 2 and 3 are consistent with the results of Table 8. In the model, domestic firms with experienced managers have higher returns than domestic firms with inexperienced managers. Since managers'

experience makes MNE more likely, those domestic firms with experienced managers are what we see in the data as future MNEs, for which the inclusion of managers fixed effects raises the stock returns premium over domestic firms.

Similarly, in the model, MNEs with experienced managers have lower returns than MNEs firms with inexperienced managers, consistent with the idea that managerial experience accounts for part of the MNE premium that is observed in the data.

6 Quantitative Analysis

We conclude the paper with a quantitative analysis whose goal is to examine the effect of frictions in the market for managers on firm selection, welfare, and aggregate financial market outcomes. More precisely, our counterfactual analysis investigates the consequences of taxing CEO pay.[25]

We calibrate the model to match moments related to firm selection and stock market variables, and then consider the effects of a policy that imposes a tax on the profits of those companies with CEO to worker compensation ratios above a certain threshold.

6.1 External validity: CEO compensation, experience, and multinational status

Before our counterfactual analysis, we check the accuracy of the model predictions in terms of managerial compensation.

At the end of the last section, we defined CEO compensation as $s(\varphi, m)$. Since CEO compensation is a fixed share of firm profits, and firm profits are increasing in firm productivity and managerial experience, the model predicts that CEO compensation should be increasing in managerial experience, and that CEOs employed by MNEs should receive higher compensation than CEOs employed by domestic firms. Table 10 shows the results of the following regression:

$$s_{it} = \beta_1 exp_{it} + \beta_2 M_{it} + \gamma X_{it} + \delta_{NAICSt} + \delta_i + \varepsilon_{it}$$

where s_{it} is denotes the log-compensation of the CEO of firm i at time t. The explanatory variables are the same as in the regressions in Section 3.

The results are displayed in Table 10 and they are fully consistent with the qualitative predictions of the model. Columns (1)-(4) show that CEO with previous experience at MN entry receive higher compensation than CEOs lacking such experience, and that CEOs working at MNEs receive higher compensation than CEOs working at domestic firms (the "MNE compensation premium"). Columns (5)-(6), which include

[25] This exercise is loosely based on policies that are currently debated in the US Congress.

Table 10: CEO compensation, multinational status, and managerial experience.

VARIABLES	(1) log_total	(2) log_total	(3) log_total	(4) log_total	(5) log_total	(6) log_total
prev_exp_MNE	0.176***	0.095***	0.211***	0.188***	0.001	0.077*
	(0.033)	(0.031)	(0.041)	(0.040)	(0.045)	(0.044)
MNE_dummy		0.866***	0.656***	0.749***	0.127***	0.073***
		(0.008)	(0.012)	(0.013)	(0.014)	(0.014)
Observations	96,828	96,828	52,341	52,234	52,181	52,074
R-squared	0.000	0.098	0.156	0.201	0.790	0.808
Controls	No	No	Yes	Yes	Yes	Yes
Industry-Quarter FE	No	No	No	Yes	No	Yes
Firm FE	No	No	No	No	Yes	Yes

Note: The dependent variable is compensation of the CEO of the firm. Sample years 1993-2005. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1
Source: CRSP/Compustat, SEC 10K filings, Execucomp, Boardroom Alpha.

firm fixed effects, show that managerial compensation increases as a firm becomes a multinational, and as the firm switches from an unexperienced to an experienced manager.

6.2 Counterfactuals: the Real and Financial Effects of Taxing CEO Pay

In this section, we modify the model by imposing an exogenous constraint c to CEO pay. For firms for which the Act binds ($c < s(\varphi, m)$), we impose a tax t on total profits The reduction in profits induced by the tax will drive some multinational firms to to exit the foreign market, if the tax makes them not profitable anymore. The real effect of the tax is to induce exit of otherwise profitable firms, and to distort the economy away from efficient entry.

In the model, firms become multinationals either because they have very good managers, or because they are very productive, or both. The welfare implications of the exit induced by the tax may differ depending on what margin is more important.

Similarly, the exit induced by the tax will shift the composition of the market portfolio, generating potentially ambiguous effects on its overall riskiness.

[RESULTS TO BE ADDED]

7 Conclusions

Multinational corporations are the largest players in the global economy. In this paper, we offer some insights on the origin of the risks these firms are exposed to.

CEOs have an undoubtedly important role in the firms' decision making process. In this paper, we focus on the role of managers as facilitators of the expansion of firms into foreign markets. Our empirical analysis

shows that management matters for firms' selection into multinational activity, and for firms' risk exposure.

We develop a theoretical model to rationalize the relationship between management, multinational activity, and firms' risk exposure. The model's tractability makes transparent the channels linking these firms' decisions and highlights how managerial decisions play a fundamental role in the origins and dynamics of MNEs' risk premia.

The model is rich, yet simple, and lends itself to a quantitative analysis that exploits its mechanisms to suggest that distortions to the market for managerial talent (in the form of taxes punishing high CEO pay) may have unwanted effects on multinational activity and financial markets.

References

Barrot, J.-N., E. Loualiche, and J. Sauvagnat (2019). The globalization risk premium. *Journal of Finance 74*(5), 2391–2439.

Berk, J. B., R. C. Green, and V. Naik (1999). Optimal investment, growth options, and security returns. *The Journal of Finance 54*(5), 1553–1607.

Bertrand, M. and A. Schoar (2003, 11). Managing with Style: The Effect of Managers on Firm Policies*. *The Quarterly Journal of Economics 118*(4), 1169–1208.

Bianconi, M., F. Esposito, and M. Sammon (2020). Trade policy uncertainty and stock returns. Mimeo, Tufts University.

Bloom, N., R. Lemos, R. Sadun, D. Scur, and J. V. Reenen (2013). The new empirical economics of management. *Journal of the European Economic Association 12*(4), 835–876.

Bloom, N. and J. Van Reenen (2007, 11). Measuring and Explaining Management Practices Across Firms and Countries*. *The Quarterly Journal of Economics 122*(4), 1351–1408.

De Sousa, J., A.-C. Disdier, and C. Gaigné (2020). Export decision under risk. *European Economic Review 121*, 1033–1042.

Esposito, F. (2020). Demand risk and diversification through international trade. Mimeo, Tufts University.

Fama, E. F. and K. R. French (1993). Common risk factors in the returns on stocks and bonds. *Journal of Financial Economics 33*(3), 3–56.

Fillat, J. L. and S. Garetto (2015). Risk, returns, and multinational production. *Quarterly Journal of Economics 130*(4), 2027–2073.

Fillat, J. L., S. Garetto, and L. Oldenski (2015). Diversification, cost structure, and the risk premium of multinational corporations. *Journal of International Economics 96*(1), 37–54.

Garetto, S., N. Ramondo, and L. Oldenski (2021). Multinational expansion in time and space. NBER Working Paper 25804.

Ghironi, F. and M. H. Wolfe (2018). Multinational production, risk sharing, and home equity bias. Mimeo, University of Washington.

Gomes, J., L. Kogan, and L. Zhang (2003). Equilibrium cross section of returns. *Journal of Political Economy 111*(4), 693–732.

Heiland, I. (2020). Global risk sharing through trade in goods and assets: Theory and evidence. CEPR DP 14230.

Helpman, E., M. J. Melitz, and S. R. Yeaple (2004). Exports versus fdi with heterogeneous firms. *American Economic Review 94*(1), 300–316.

K. Dixit, A. and R. S. Pindyck (1994, 01). Investment under uncertainty / a.k. dixit, r.s. pindyck. *New Jersey: Princeton University Press*.

Lucas, R. E. (1978). On the size distribution of business firms. *The Bell Journal of Economics 9*(2), 508–523.

Malmendier, U. and G. Tate (2008). Who makes acquisitions? ceo overconfidence and the market's reaction. *Journal of Financial Economics 89*(1), 20–43.

Melitz, M. J. (2003). The impact of trade on intra-industry reallocations and aggregate industry productivity. *Econometrica 71*(6), 1695–1725.

Ramondo, N. and V. Rappoport (2010). The role of multinational production in a risky environment. *Journal of International Economics 81*(2), 240–252.

Rowland, P. F. and L. L. Tesar (2004). Multinationals and the gains from international diversification. *Review of Economic Dynamics 7*(4), 789–826.

Schoar, A., K. Yeung, and L. Zuo (2020). The effect of managers on systematic ris. NBER Working Paper 27487.

Appendix

A Data Assembly and 10-K Parsing Procedure

We download from the SEC Edgar's website all the 10-K filings for the universe of firms with publicly traded equity from 1993 through 2017. More recent filings have an *html* format, while older files are plain text. The structure for recent filings is such that an Exhibit 21 is submitted as a separate *html* file. Older text filings may have a separate Exhibit 21 *txt* file or include all the information in a unique 10-K file that contains the exhibit 21 information too. Figure A.1 shows the Exhibit 21 for a firm in our sample, McDonald's Corporation.

The 10-K filings are our main source of information for classifying firms as domestic or multinational in a given year. Our algorithm processes the different *html* and *txt* files separately. For *html* files, the code looks for the label *tables* inside the Exhibit 21 files and extracts the information on each subsidiary and location. For the text files, the algorithm reads each line of the file, looking for a structure containing names of subsidiaries, blank spaces, and locations. For the 10-K files that contain all the information in one file, the code reads each line of the file, looking for any country name from a dictionary. If no country name is found, the firm is defined as domestic. Of the remaining firms where a foreign country is mentioned, the algorithm looks for the structure of the name, blank spaces, and location to determine the multinational status. In addition, the algorithm searches for wording referring to "affiliate," "subsidiary," "subsidiaries," "plant," "foreign operations," or "21," in a window of 100 characters surrounding the mention of a foreign country in order for the firm to be classified as a multinational.

We use quarterly fundamentals from CRSP/Compustat Merged, a detailed database of standardized financial and market information for publicly traded firms provided by Wharton Research Data Services, for the sample firms present during the 1993–2017 period. The data we use range from financial fundamentals such as long-term debt; short-term debt; EBITDA; revenues; property, plant and equipment; and employment to market information such as monthly returns and market capitalization. The parsed SEC 10-K filings are merged onto the quarterly CRSP/Compustat data set based on the Central Index Key (CIK) to provide annual information on the multinational status of Compustat firms. Firms with missing 10-K filings at the start or end of the sample are imputed using the first or latest non-missing filing, respectively. For firms that contain short 10-K filing gaps (that, is domestic to missing to domestic or multinational to missing to multinational for one or two years), values are imputed as the status before and after the gap. For gaps where the status changes following the gap, if the gap is greater than or equal to four quarters, we parse through the 10-K Exhibit 21s manually, imputing values that supersede the algorithm's output. For gaps shorter than four quarters, we leave it as is, and the missing status is considered within the year of the gap, with respect to firm categorization (described below). There are no attempts made to impute the multinational status for firms that are never captured in the algorithm unless that information was hand-collected at an

earlier point in time. We compute the firm-level betas by running rolling one-year window regressions of monthly firm returns on the CRSP Total Market Index.

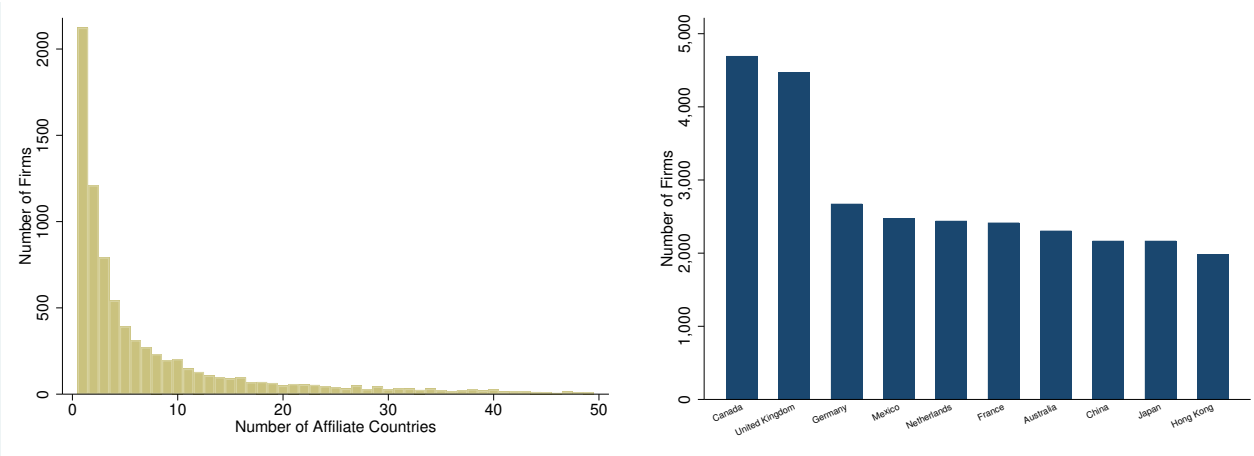
Thomson Reuters Mergers and Acquisitions Data provide deal-level M&A data for domestic firms from 1993 through 2017. Thomson Reuters M&A is an expansive platform for analyzing financial market, company fundamentals, and transaction deal data. We opt to exclude any deals that involve buybacks and recapitalizations to ensure we capture only proper acquisitions. Any deals that are related to territories of larger entities are re-categorized within the parent state. Data at the acquisition level are then merged back into the quarterly fundamentals using the historical CUSIP to record the number of acquisitions and the value of the deals, both domestic and foreign, within a given quarter. Foreign acquisitions that do not match with a change of multinational status in the firms' 10-K are checked by hand. If an acquirer shows no change in multinational status following the acquisition, the acquisition is removed.

We then categorize firms using the PERMCO, a unique permanent identifier for firms provided by CRSP/Compustat. Once domestic or multinational status is assigned to each firm in each quarter using 10-K information, firms are categorized into seven unique classifications based on characteristics the year of, the year before, and the year after the initial change into multinational status or the first foreign acquisition. Always domestic firms and always multinational firms are firms for which their status is domestic and multinational, respectively, throughout the entire sample period, with no foreign acquisitions or change of status. New MNE acquirers are firms that enter in the sample as domestic firms and we observe a foreign acquisition in Thomson Reuters M&A data within a year of the 10-K filings showing the existence of a foreign subsidiary. Additionally, we impute the status of new MNE acquirers following the first foreign acquisition as multinational if the foreign acquisition occurs prior to the indicated status change. New greenfield MNEs are firms that change their multinational status according to the 10-K filings but for which we do not identify a foreign acquisition in Thomson Reuters within the year before, of, and after the event. The set of *other firms* comprises firms that change from multinational to domestic or that change status several times in the sample, and also firms for which we do not observe a status change one year around a foreign acquisition. There are 6,155 firms in Compustat for which we are not able to parse 10-K information.

Figure A.1: Example of Exhibit 21: McDonald's Corporation

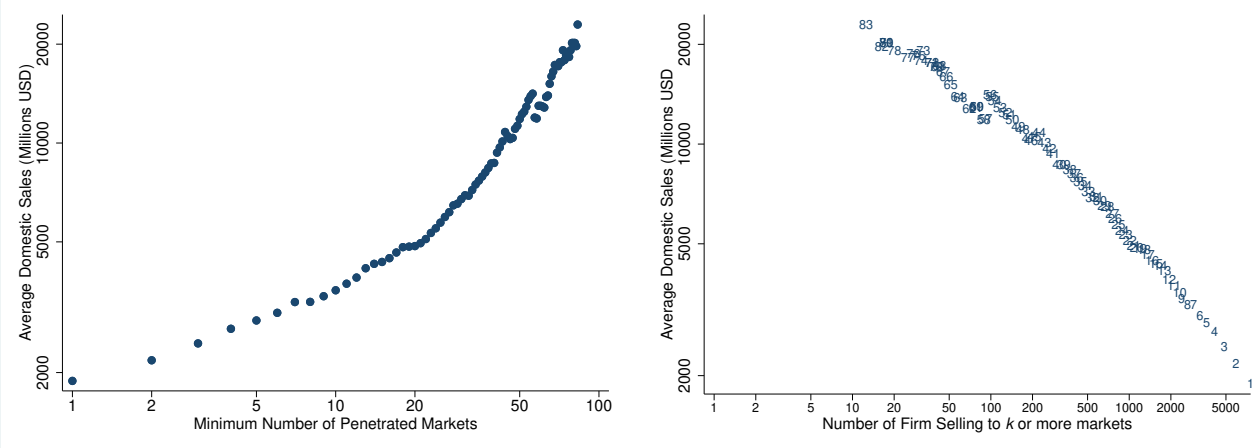
B Additional Data Description

Figure B.1: MNE Affiliates' Host Countries



Note: The left panel shows the distribution of the number of firms having affiliates in n host countries. The right panel shows the number of firms having affiliates in the top 10 host countries.
Source: SEC 10-K filings.

Figure B.2: MNE Sorting by Size into Host Countries



Note: The left panel shows an increasing relationship between parent sales and the number of countries in which the firm has affiliates: Firms that are larger in the United States enter more markets. The right panel also shows that larger firms sell to less popular markets.
Source: SEC 10-K filings.

C Empirical Analysis: Robustness

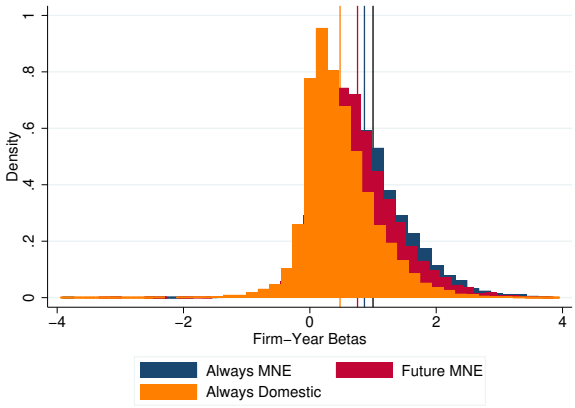


Figure C.1: Distribution of Firm *Betas*, by Firm International Status.

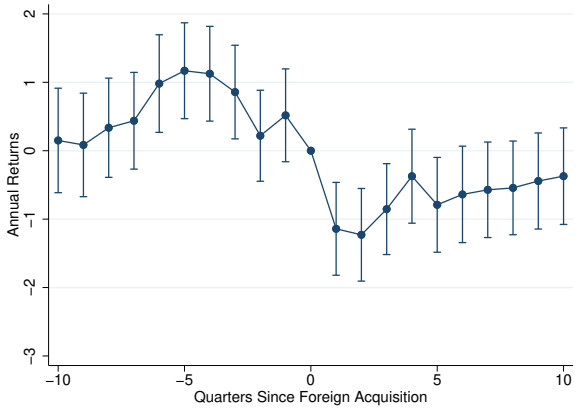
Note: Distribution of annual firm-level CAPM *betas*. The black line indicates a firm-year *beta* equal to one. The colored lines indicate the average *beta* of the respective subsample.

Table C.1: Becoming a Multinational: Management Matters. Linear Probability Model with Fixed effects.

	(1)	(2)	(3)	(4)
Market Capitalization	0.003***	-0.000***	-0.000***	-0.000***
	(0.000)	(0.000)	(0.000)	(0.000)
Leverage Ratio	0.131***	0.098***	0.092***	0.097***
	(0.005)	(0.007)	(0.008)	(0.008)
Sales/Employee	0.004**	0.003***	0.003***	0.003***
	(0.002)	(0.001)	(0.001)	(0.001)
Capital/Employee	-0.017***	-0.008***	-0.010***	-0.010***
	(0.002)	(0.001)	(0.001)	(0.001)
Beta (Annual)	0.061***	0.022***	0.020***	0.019***
	(0.003)	(0.003)	(0.003)	(0.003)
Constant	0.608***	0.669***	0.672***	0.672***
	(0.004)	(0.003)	(0.003)	(0.003)
Industry-Quarter FE	Yes	Yes	Yes	Yes
Firm FE	No	Yes	No	Yes
Executive FE	No	No	Yes	Yes
Observations	82,921	82,921	82,921	82,921
Adjusted R-squared	0.190	0.695	0.748	0.751

Note: The dependent variable is a dummy taking a value of 1 if a firm is a multinational in quarter-year t. Robust standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Source: CRSP/Compustat, Thomson Reuters M&A, SEC 10-K filings, Execucomp.

Figure C.2: Changes in Stock Returns after a Foreign Acquisition



Note: Coefficients from regressing quarterly annualized returns on a set of dummies indicating quarters since the event. Controls include market capitalization, leverage ratio, sales per employee, capital per employee, and the firm beta. Industry-quarter fixed effects and firm fixed effects are also included. Standard errors are clustered at the firm level. 95% confidence intervals shown. Source: CRSP/Compustat, Thomson Reuters M&A, and SEC 10-K filings.

Table C.2: Becoming a Multinational: Management Matters. Probit Specification with Experience Controls.

	(1)	(2)	(3)	(4)
Market Capitalization	0.011***	0.011***	0.011***	0.011***
	(0.000)	(0.000)	(0.000)	(0.000)
Leverage Ratio	0.034***	0.035***	0.035***	0.035***
	(0.005)	(0.005)	(0.005)	(0.005)
Sales/Employee	-0.084***	-0.084***	-0.087***	-0.083***
	(0.008)	(0.008)	(0.008)	(0.008)
Capital/Employee	-0.050***	-0.050***	-0.050***	-0.050***
	(0.001)	(0.001)	(0.001)	(0.001)
Beta (Annual)	0.124***	0.125***	0.124***	0.123***
	(0.003)	(0.003)	(0.003)	(0.003)
Manager with previous MNE experience	0.152***			
	(0.013)			
Manager with previous acquisition experience		0.071***		
		(0.014)		
Number of previous acquisitions of current manager			0.025***	
			(0.003)	
Number of countries entered by current manager				0.037***
				(0.003)
Observations	82,921	82,921	82,921	82,921

Note: The dependent variable is a dummy taking a value of 1 if a firm is a multinational in quarter-year t. "Number of previous acquisitions" is the number of acquisitions that the manager oversaw at other firms. "Number of country entries" denotes the number of countries where MNEs established new affiliates under the manager's leadership. Robust standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Source: CRSP/Compustat, Thomson Reuters M&A, SEC 10-K filings, Execucomp.

Table C.3: Becoming a Multinational: Good Management Matters

	(1)	(2)
Leverage Ratio	0.077***	0.077***
	(0.015)	(0.013)
Beta (Annual)	0.063***	0.059***
	(0.007)	(0.007)
Sales/Employee	0.000	0.000**
	(0.000)	(0.000)
Capital/Employee	-0.000***	-0.000***
	(0.000)	(0.000)
Market Capitalization	0.098***	0.149***
	(0.003)	(0.005)
Average Management Score (Filled)	0.057***	
	(0.006)	
Bad Management Score		-0.012
		(0.012)
Good Management Score		0.073***
		(0.009)
Observations	5,762	11,382

Note: Probit regression. The dependent variable is a dummy taking a value of 1 if a firm is a multinational in quarter-year t, scaled to 100 for interpretation purposes. Robust standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Source: CRSP/Compustat, Thomson Reuters M&A, SEC 10-K filings, Execucomp.

Table C.4: Returns of Future MNEs: Management Matters - Full Table

	(1)	(2)	(3)	(4)	(5)
Current Multinationals	-0.205	-0.073	5.343	-1.735***	-1.831***
	(0.377)	(0.402)	(4.207)	(0.595)	(0.642)
Future Multinationals	0.954**	1.153***	7.189*		
	(0.412)	(0.444)	(4.198)		
Acquirer	1.477***	1.265***	0.574	0.679*	0.569
	(0.373)	(0.350)	(0.387)	(0.380)	(0.387)
Market capitalization	1.050***	0.253***	1.423***	1.073***	1.506***
	(0.098)	(0.038)	(0.122)	(0.105)	(0.129)
Leverage Ratio	-2.335***	-2.204***	-3.036**	-3.368***	-2.995**
	(0.489)	(0.497)	(1.297)	(1.168)	(1.320)
Sales/Employee	-0.000	0.002*	0.004*	0.004*	0.004
	(0.000)	(0.001)	(0.003)	(0.002)	(0.003)
Capital/Employee	-0.000	-0.000**	-0.000*	-0.000*	-0.000*
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Beta (annual)	0.411	0.518	0.825	0.973**	0.791
	(0.318)	(0.324)	(0.521)	(0.480)	(0.524)
Constant	3.697***	4.463***	-3.088	3.699***	2.995***
	(0.365)	(0.429)	(3.645)	(0.646)	(0.704)
Firm FE	No	No	No	Yes	Yes
Executive FE	No	No	Yes	No	Yes
PSM	No	Yes	Yes	Yes	Yes
Observations	31,040	30,610	30,273	30,466	30,268
Adjusted R-squared	0.179	0.187	0.198	0.198	0.199
Current Minus Future MNE p-Val	.001	.001	.004	.004	.004

Note: The dependent variable is quarterly firm-level stock returns. Controls include market capitalization, leverage ratio, sales per employee, capital per employee, and the firm *beta*. All specifications include industry-quarter fixed effects. The sample excludes "Other MNEs," or firms that enter the sample period as MNEs and later switch to only domestic operations. Robust standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Source: CRSP/Compustat, Thomson Reuters M&A, SEC 10-K filings, Execucomp.

Table C.5: Managers and Systematic Risk

	F-tests on fixed effects for							
	Years		Firms		CEOs		N	adj. R^2
Always Domestic								
	101.97	(1.76)	6.23	(1.12)			3080	**0.488**
	93.84	(1.76)	1.58	(1.40)	2.18	(1.20)	3080	**0.513**
Future MNEs								
	77.45	(1.75)	7.33	(1.09)			4141	**0.532**
	71.44	(1.75)	1.39	(1.29)	1.62	(1.14)	4141	**0.544**
Always MNEs								
	75.37	(1.75)	12.52	(1.09)			6544	**0.580**
	65.79	(1.75)	1.97	(1.17)	1.88	(1.09)	6544	**0.610**

Note: The dependent variable is annual firm *betas*, estimated by running a regression of individual security monthly-level stock returns on the market aggregate returns (NYSE, AMEX, and Nasdaq) for year year in the sample period. F-statistics in parentheses. Figure C.1 shows the distribution of the estimated *betas*.
Source: CRSP/Compustat, SEC 10K filings, Execucomp.

D Derivations

D.1 Solution of the Value Functions and Policy Function

Domestic sales. The Bellman equation for the value of domestic sales is given by equation (12). This equation can be re-written as:

$$\pi(\varphi, C)M\Delta t + E[d(M \cdot V_D(\varphi, C')] = 0 \tag{D.1}$$

where it can be shown that:

$$E[d(M \cdot V_D] = Mdt \left[-rV_D + E\left(\frac{dV_D}{dt}\right) + E\left[\frac{dM}{M} \cdot \frac{dV_D}{dt}\right]\right. \tag{D.2}$$

where the dependence of the value function on (φ, C') is omitted to ease the notation.

Hence the Bellman equation can be rewritten as:

$$\pi(\varphi, C) - rV_D + E\left(\frac{dV_D}{dt}\right) + E\left[\frac{dM}{M} \cdot \frac{dV_D}{dt}\right] = 0 \tag{D.3}$$

where Ito's lemma implies that:

$$dV_D = \left[\mu C V_D' + \frac{1}{2}\sigma^2 C^2 V_D''\right] dt + \sigma C V_D' dz. \tag{D.4}$$

Plugging the result of Ito's lemma into the Bellman equation and eliminating higher order terms, one obtains the fundamental quadratic equation:

$$\frac{1}{2}\sigma^2 C^2 V_D'' + (\mu - \gamma\sigma^2) C V_D' + \pi(\varphi, C) - r V_D = 0. \tag{D.5}$$

One can guess that the solution of the value function takes the form:

$$V_D = B_1 C^{\beta_1} + B_2 C^{\beta_2} + B_3 C. \tag{D.6}$$

By the method of undetermined coefficients, β_1 and β_1 are the positive and negative roots, respectively, of: $\frac{1}{2}\sigma^2\beta^2 + (\mu - \frac{1}{2}\sigma^2 - \gamma\sigma^2)\beta - r = 0$ and that $B_3 = \frac{A\varphi^{\eta-1}}{r-\mu-\gamma\sigma^2}$. In addition, it must be that $B_2 = 0$ in order for the value function to have a finite limit for $C \to 0$, and $B_1 = 0$ so that the value function is equal to the discounted value of profits for $C \to \infty$. These restrictions lead to the value function in equation (15).

Foreign sales. By following an identical procedure to the one above, one can also show that the value function of foreign sales $V_F(\varphi, m, C^*)$ takes the form in equation (16).

In order to derive the value function of the option value of foreign sales, the procedure needs to start from evaluating the Bellman equation in the continuation region:

$$E[d(M \cdot V_F^o(\varphi, m, C^{*\prime})] = 0. \tag{D.7}$$

In this case, the fundamental quadratic equation doesn't include a profit term, so the solution of the value function takes the form:

$$V_F^o = B_1 C^{\beta_1} + B_2 C^{\beta_2}, \tag{D.8}$$

where it must be that $B_2 = 0$ in order for the value function to have a finite limit for $C \to 0$.

Policy Function. It remains to determine the expression for the option value term B_1, and the policy function, which in this case takes the form of a firm-specific threshold $\bar{C^F}$ in the realization of the shock C^* such that a firm will decide to become a multinational for any realization of foreign demand $C^* > \bar{C^F}$.

B_1 and $\bar{C^F}$ are the solutions of the system of value matching and smooth pasting conditions:

$$V_F^o(\varphi, m, C^*) = V_F(\varphi, m, C^*) - F \tag{D.9}$$

$$V_F^{o'}(\varphi, m, C^*) = V_F'(\varphi, m, C^*). \tag{D.10}$$

D.2 Derivation of Expected Returns

For a domestic firm, combining the no-arbitrage conditions (the fundamental quadratic equations) for domestic and foreign sales:

$$\pi - r V_D + (\mu - \gamma\sigma^2) C V_D' + \frac{1}{2}\sigma^2 C^2 V_D'' - r V_F^o + (\mu^* - \gamma\chi\sigma\sigma^*) C^* V_F^{o\prime} + \frac{1}{2}\sigma*^2 C^{*2} V_F^{o\prime\prime} = 0. \tag{D.11}$$

This condition can be rewritten as:

$$\begin{aligned}
\pi - rV_D - \gamma\sigma^2 CV'_D + E(dV_D) - rV_F^o - \gamma\chi\sigma\sigma^* C^* V_F^{o\prime} + E(dV_F^o) &= 0 \\
\pi + E(dV_D) + E(dV_F^o) &= rV_D + rV_F^o + \gamma\sigma^2 CV'_D + \gamma\chi\sigma\sigma^* C^* V_F^{o\prime} \\
\frac{E(\mathcal{V}_D) + \pi_D}{\mathcal{V}_D} &= \frac{r\mathcal{V}_D + \gamma\sigma^2 CV'_D + \gamma\chi\sigma\sigma^* C^* V_F^{o\prime}}{\mathcal{V}_D} \quad \text{(D.12)}
\end{aligned}$$

where the left hand side of the equation is the definition of expected returns.

Similarly one can show that the expected returns of a multinational firm are given by equation 21.