On the Origins of the Multinational Premium*

Jose Fillat
Federal Reserve Bank of Boston

Stefania Garetto
Boston University, CEPR and NBER

May 21, 2024

Abstract

This paper studies the relationship between management, firm expansion, and firm risk exposure. We document two empirical regularities. First, firms run by managers with previous experience in multinational expansion are more likely to become multinationals (MNEs). Second, current and future MNEs command a higher risk premium than firms that sell always and only in their domestic market. To provide a mechanism that connects these facts, we develop a dynamic model in which managerial ability 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

*Frankie Lin and Brenton Stefko provided outstanding research assistance. The paper reflects the authors' views and not those of the Federal Reserve Bank of Boston or the Federal Reserve System. We are thankful for comments and feedback received from seminar and conference participants at the Atlanta Fed, Brown, Colgate, CREI, Harvard, LSE, Michigan State, Nottingham, Rochester, SUNY Albany, the University of Kentucky, UT Austin, WashU and conference attendees at the AEA 2021 Annual Meeting, Barcelona GSE Summer Forum, EIIT 2022, ERWIT 2021, SED 2021 Annual Meeting, and 2021 World Finance Association. We are especially grateful to Vanessa Alviarez and Fabian Trottner for their helpful discussion of the paper, and to Daniela Scur for her help accessing the World Management Survey Data.

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 natural that CEO characteristics simultaneously determine the firm's risk profile and its international presence, directly or indirectly.

We establish two empirical regularities. First, firms run by managers with previous experience in episodes of multinational expansion at other firms are more likely to become multinationals (MNEs). We provide evidence whereby managers' role in promoting FDI is driven by different fixed costs of firms with managers with different experience. More precisely, while managerial experience is positively correlated with the fixed costs of domestic firms, it instead appears to be negatively correlated with the fixed costs of MNEs. Second, current and future MNEs –the latter being defined as firms that currently operate only in their domestic market, but will engage in FDI sometime in the future– command a higher risk premium than firms that sell always and only in their domestic market. We establish this fact by looking at differences in long-term average stock returns for firms with different multinational status.

To provide a narrative that connects and rationalizes these novel empirical patterns, we nest a dynamic model of foreign direct investment into a standard consumption-based asset pricing model. In the model, heterogeneous firms decide the type of manager they hire, and whether and when to enter the foreign market and become multinationals. Consistently with our empirical evidence, we assume that firms that are run by higher ability managers have higher fixed costs of domestic operations, but lower fixed costs of multinational expansion. For this reason, the manager hiring decision is disciplined by a trade-off between the higher costs of domestic operations and the increased profitability of multinational expansion. Consistent with the empirical evidence, in the model, more productive firms hire better managers and –as a result– firm productivity and managerial ability jointly drive selection into FDI.

Dynamics in the model economy are driven by fluctuations in aggregate consumption. Accordingly, the aggregate source of risk is given by fluctuations in the agents' stochastic discount factor. Firm-level stock returns in the model, in turn, are given by the covariance between the stochastic discount factor and changes in the value of the firm. Managerial ability and multinational status, by affecting firms' fixed operating costs, also affect firm operating leverage and drive heterogeneity in firm exposure to aggregate risk and, hence, heterogeneity in expected returns.

The model is extremely tractable and delivers analytical predictions that rationalize the empirical regularities we documented. First, and naturally, since high ability managers reduce the fixed costs of FDI, firms that are run by better managers are more likely to become MNEs. Second, since domestic firms that are run by higher ability managers have a higher option value of starting FDI, they have higher expected returns than domestic firms that are run by lower ability managers. Since domestic firms that are run by higher ability managers are more likely to become MNEs, these predictions rationalize the future MNEs' risk premia. Lastly, since high ability managers reduce the fixed costs of FDI, they reduce MNEs' operating leverage, so that MNEs run by higher ability managers have lower returns than MNEs run by low ability managers.

Taken together, these predictions of the model imply that controlling for managerial ability should reduce the risk premium differentials between MNEs and domestic firms. We provide suggesting evidence that this is the case by examining the empirical risk premia with the addition of manager fixed effects.

We believe that this is the first paper to show a systematic relationship between managerial characteristics, firms' multinational status, and risk. Since the assumptions we make in setting up the model are carefully driven by the empirical evidence, we are confident in exploring its lessons further. In particular, our model predicts a positive correlation between managerial compensation, managerial ability, and firm multinational status, a feature that is also consistent with the data. 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 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 distort 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 manager information from Execucomp and Boardroom Alpha, which track the CEOs of a sub-sample of publicly listed firms. CRSP contains data on one of our dependent variables 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. The resulting sample is an unbalanced matched firm-manager panel for the period 1993-2017. It is important to point out that our data are unique in that they allow us to compare a firm's characteristics before and after its first episode of multinational entry.

Our emphasis on management as an important driver of firm decisions links this paper to a rich literature on the role of managers for firms' outcomes. Theoretically, the link between managerial ability and the firm's returns to scale is reminiscent of Lucas (1978). A positive relationship between firm productivity and managerial ability is also present in Terviö (2008), who models the match between firms and managers through an assignment model. Our modeling strategy produces analogous results in terms of positive assortative matching between firms and managers, and it allows us to evaluate distorsions to manager hiring in a more flexible way. Empirically, 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 makes our paper also close 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 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.

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 (2022), and Heiland (2021) study export decisions in risky environments. Barrot et al. (2019) and Bianconi et al. (2021) 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) and Fillat et al. (2015) study MNEs' location decisions in risky environments. By exploiting cross-sectional variation across firms, Fillat and Garetto (2015) document stock return differentials among multinationals, exporters, and domestic firms, and rationalize them within a model where the different fixed costs associated with international activities drive operating leverage and heterogeneity in returns. This paper contributes to this line of work by examining the role of managers in the dynamic relationship between multinational entry and stock returns.

Lastly, 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) presents 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 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 managerial ability and the decision to undertake foreign investment.

2 Data and summary statistics

Our data set derives from combining several sources: the linked CRSP-Compustat data, the 10-K files, Execucomp, and Boardroom Alpha. For robustness checks, 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 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 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 sample contains data for 11,982 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 MNEs* 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, or by establishing an affiliate afresh. 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 and summary statistics of size measures of the firms in our sample. The table confirms the well-known fact that MNEs are larger than domestic firms in terms of sales, employment, and market capitalization.

In our sample, foreign affiliates are located in 169 countries. The geographic distribution of FDI activity is comparable to other data sets, including the Bureau of Economic Analysis data on the operations of multinational enterprises.[6] It is worth noting that our merged data set is unique in its capacity to identify US firms' entry into multinationality: the information contained in the 10-K affiliate reporting informs us about the extensive margin of multinationality, on aggregate and by foreign country.[7]

[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 over 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 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] See Appendix Figures B.1 and B.2. Garetto et al. (2024) report the same sorting properties of FDI destinations for US MNEs using the Bureau of Economic Analysis (BEA) data.

[7] Most empirical analyses of US MNEs use the affiliate-level data from the Bureau of Economic Analysis

Table 1: Firm Characteristics by Firm Type.

	Revenue (USD Million)	Employees (Thousands)	Mkt. Cap. USD Million	Nr. of Firms
Always Dom.	85.96	1.59	470.96	4936
Always MNE	740.86	9.83	4508.23	2846
New MNE	312.00	5.06	1426.04	2732
Other Firms	333.99	5.64	1517.44	1382

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

Since part of our empirical analysis focuses on stock returns, Table 2 reports summary statistics of firm-level stock returns by firm type.[8] 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 2: Annualized Quarterly Returns by Firm Type.

	Mean	Median	Standard Dev.
Always Dom.	4.37	5.04	16.87
Always MNE	5.31	5.92	15.89
New MNE	7.15	6.78	10.60
Other Firms	6.73	6.35	11.52

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

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. 46.05% (28.11%) of firms in our sample have information about the identity of their CEO at some point in their lifetime (for their entire lifetime). The full sample is composed by 10,391 managers, 690 (6.64%) of which change firm at some point in the sample period. Since managers exhibit limited mobility across firms, the average (median) number of managers that a firm has during its life in the sample is 1.9

(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.

[8] 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.

(1).

Our data provide us with information on the involvement of managers in multinational activity. 70.07% of managers in our sample worked for a MNE at some point in their lifetime. However, only 19.59% of managers in our sample oversaw their firm's transition from being domestic to becoming a multinational. Looking at the extensive margin of countries, 35.66% of managers in our sample oversaw their firm's entry into a new country.

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.

3 Empirical Analysis

In this section we establish two empirical findings: 1. Firms run by managers with previous experience in multinational expansion are more likely to become multinationals; 2. Current and future MNEs command a higher risk premium than firms that sell always and only in their domestic market. The uniqueness of our merged data, which contains information about firms' characteristics, international presence, and identity of the managers, allows us to explore these three dimensions simultaneously.

3.1 Management and Multinational Entry

There is a large empirical literature documenting the role of managers and managerial practices for various aspects of firm performance.[10] 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

[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] 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.

in quarter-year t. The regressions explore the role of managers' characteristics in explaining multinational status. Equation (1) describes 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.[11]

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 3.[13] Columns (1)–(4) show the fixed effects results of estimating 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 the small subsample of managers that have worked at a minimum of two firms in our sample (slightly more than 6% of the total). Moreover, the addition of manager fixed effects has an incremental effect on the R^2 also when firm fixed effects are included.

In columns (5)–(6) of Table 3, 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.[14]

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 5.2 percentage points higher probability of becoming multinational compared with a domestic firm managed by a manager without such

[11] Since only about 20% of managers guide firms through transitions into multinationality, and managers' mobility is low, only about 1% of managers are "experienced" according to the most restrictive definition of experience (having guided a previous firm through a transition from domestic to multinational).

[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).

[13] In the interest of space, we report the estimation results for the variables of interest only. The full table is reported in Appendix C.

[14] In the table, we report the marginal effects. In the interest of space, Table 3 does not report the estimates for the controls. Appendix Table C.1 reports the full results of regressions (1)-(2).

Table 3: Becoming a Multinational: Management Matters

	(1)	(2)	(3)	(4)	(5)	(6)
Manager w. previous MNE entry experience					0.052***	
					(0.013)	
Number of countries entered by current manager at previous firms						0.006***
						(0.002)
Firm FE	No	Yes	No	Yes	Yes	Yes
Executive FE	No	No	Yes	Yes	No	No
Observations	133,519	133,519	133,519	133,519	133,519	133,519
Adjusted R-squared	0.149	0.701	0.741	0.759	0.701	0.701
F-test FE		$p < 0.0001$	$p < 0.0001$	$p < 0.0001$	$p < 0.0001$	$p < 0.0001$

Note: The dependent variable is a dummy taking a value of 1 if a firm is a multinational in quarter-year t. The variable "Previous MNE transition experience" takes the value of 1 if the manager has prior experience in guiding another firm's transition from domestic to MNE. "Number of countries entries" denotes the natural log of 1 + the number of countries where previous 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, SEC 10-K filings, Execucomp, Boardroom Alpha.

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 0.6 percentage points. Given that the median (average) number of countries entered by a manager with MNE entry experience is 5 (9.72), hiring a manager that has led previous firms through one more country entry episode than the median (average) leads to an increase of 3.6 (6.4) percentage points in the probability of becoming a multinational.

Columns (5) and (6) of Table 3 focus on two manager characteristics that are measurable in our data, and that appear intuitively important. Appendix Table C.2 shows that other proxies of managerial experience have similar effects on multinational entry. Similarly, 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? The international trade literature, both empirical and theoretical, has stressed the importance of fixed frictions as a deterrent to firm entry into foreign markets (see, among others, Helpman et al. 2004). To shed light on the mechanism linking managerial characteristics and multinational entry, we investigate the relationship between managers' characteristics and the firms' fixed costs. To this end, we run regressions analogous to (1)-(2), but with a measure of firm-level fixed costs ("Selling, General and Administrative

Table 4: Managerial Experience is Negatively Related to Firm Fixed Costs

	(1)	(2)	(3)	(4)	(5)	(6)
MNE	1.183***	0.206***	0.192***	0.155***	1.183***	1.178***
	(0.015)	(0.008)	(0.006)	(0.006)	(0.015)	(0.015)
Manager w. previous MNE entry experience					0.239***	
					(0.086)	
MNE x Manager w. previous MNE entry experience					-0.096	
					(0.098)	
Number of country entered by current manager at previous firm						0.389***
						(0.030)
MNE x Number of country entered by current manager at previous firm						-0.138***
						(0.031)
Observations	102,379	101,647	102,200	101,610	102,379	102,379
Adjusted R-squared	0.454	0.959	0.952	0.970	0.454	0.457
Firm FE	No	No	Yes	Yes	No	No
Executive FE	No	Yes	No	Yes	No	No

Note: The dependent variable is firm-level fixed costs, measured as "Selling, General and Administrative Expense". The variable "Previous MNE transition experience" takes the value of 1 if the manager has prior experience in guiding another firm's transition from domestic to MNE. "Number of countries entries" denotes the natural log of 1 + the number of countries where previous 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, SEC 10-K filings, Execucomp, Boardroom Alpha.

Expense") on the left-hand side.[15]

The results of these regressions are reported in Table 4.[16] First, the comparison of columns (1)-(4) shows that manager fixed effects significantly contribute to explain the variation in firm-level fixed costs, in addition to the contribution of firm fixed effects. Second, 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 appears to have an asymmetric impact on firm's fixed costs depending on the firm's international status. Columns (5) and (6) of Table 4 indicate that both definitions of managerial experience are positively correlated with the fixed operating costs of domestic firms, while they are negatively correlated with the fixed operating costs of MNEs. This is an important finding, as fixed costs play a crucial role in the engagement of firms in multinational activities. Appendix Table C.4 shows the relationship between other proxies of managerial experience and firm fixed costs.

[15]The description of the variable "Selling, General and Administrative Expense" 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.

[16]Also for this table, in the interest of space, we do not report the estimates for the controls.

Building on the evidence shown in this section, in our model, we assume that managerial characteristics affect the fixed costs of both domestic and foreign operations.

3.2 Multinational Premia

We follow two complementary approaches to establish a relationship between firms' multinational status and firm-level risk premia. First, we study the role of firm characteristics on expected returns.[17] We take expected returns as a measure of risk because, keeping everything else constant, and under standard risk aversion specifications, riskier investments should have higher expected returns than safer investments. In our analysis, we include indicators of multinational activity among the firm characteristics we use to explain stock returns. 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 not only during, but 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 are currently domestic, 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-year t. Like in our selection regressions, M_{it} is a dummy variable that takes a value of 1 if firm i is an MNE at time t. The combination of dummies $[1 - M_{it}] \cdot \max_{\tau > t} M_{i\tau}$, instead, 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 current MNE dummy, β_m, identifies the cross-sectional differential stock returns of multinational firms compared with always domestic firms (the excluded category) within an industry-quarter

[17] We use long-run average stock returns as an empirical measure of expected returns.

bin. The coefficient β_f measures the additional stock returns that firms that are not currently MNEs, but will be at some point in the future, carry over always domestic firms. 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.

Table 5: Returns of Future MNEs

	(1)	(2)
Current Multinationals	0.644***	0.579**
	(0.223)	(0.247)
Future Multinationals	1.382***	1.289***
	(0.255)	(0.280)
Market Capitalization	1.938***	1.919***
	(0.081)	(0.083)
Leverage Ratio	-1.113***	-0.808***
	(0.255)	(0.290)
Sales/Employee	0.001	0.001
	(0.000)	(0.001)
Capital/Employee	-0.000**	-0.000**
	(0.000)	(0.000)
Beta (Annual)	-0.080	-0.112
	(0.188)	(0.201)
Constant	1.045***	1.035***
	(0.187)	(0.234)
Observations	78,310	68,328
Adjusted R-squared	0.138	0.142
Current Minus Future MNE p-Val	.003	.004
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 and SEC 10-K filings.

The results in Table 5 show that multinational firms exhibit significantly higher stock returns compared with domestic firms, consistent with what Fillat and Garetto (2015) show for the manufacturing sector. In addition, Table 5 indicates that, prior to MNE entry, future MNEs already had higher stock returns 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.[18] The results are analogous to the

[18]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

baseline specification. In both specifications, the industry-quarter fixed effects absorb industry- and time-specific 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.[19] 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.[20] The results are displayed in Table 6.

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

propensity scored. These matched firms are used in the regression (3), along with the treated firms.

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

[20] 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 6: Fama-French Portfolio Regressions: MN status

	Always Domestic	Future MNEs	Always MNEs
β_{MKT}	**0.821*** **	**1.011*** **	**0.977*** **
	(0.031)	(0.033)	(0.019)
β_{HML}	0.435***	0.225***	-0.158***
	(0.045)	(0.047)	(0.028)
β_{SMB}	0.388***	0.349***	-0.125***
	(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.

of the model in Section 4, in which firms' cash flows are exposed to an aggregate source of risk.

The evidence reported in this section establishes the existence of sizable risk premia for current and future MNEs. The results for future MNEs, in particular, suggest that these firms are somehow "different" from always domestic firms, and stockholders can observe (and price) the characteristic that makes these firms different. Our evidence on the importance of managerial characteristics for firm-level fixed costs and selection into MN status gives us confidence about a mechanism whereby managerial characteristics have an effect on both firms' expansion decisions and on risk premia. We present such mechanism in the structural model that follows.

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.

Following a long tradition in international trade that started with Melitz (2003), in the model, we assume that firms are heterogeneous in productivity. Firms choose the type of manager they hire, whether and when to become MNEs, and their output levels in each country they operate in.

The results of our Fama-French regressions in Table 6 show that stock returns are linked to firm-level exposure to aggregate factors. Consistent with this evidence, we assume that aggregate risk factors are reflected in the agents' intertemporal marginal rate of substitution, so that firm-level stock returns are driven by heterogeneous firm-level exposure to aggregate factors. More precisely, the expected returns of firm i are higher the lower the covariance between the agents' stochastic discount factor (dM/M) and changes

in the value of the firm (dV_i/V_i):

$$E(ret_i) - r_f = -r_f \cdot Cov\left(\frac{dM}{M}, \frac{dV_i}{V_i}\right), \tag{4}$$

where $E(ret_i)$ denotes the expected return of firm i, 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_i/V_i, are endogenous and firm-specific, and depend on firms' manager hires and 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 firms that are heterogeneous in their productivity level φ. Firm-level productivity is drawn at firm birth from an exogenous and time-invariant distribution $G(\varphi)$. Since each firm produces a unique variety, as it is customary in the literature, we denote a variety by the productivity level of the firm that produces it, $c_i = c(\varphi)$.

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

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

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

Managers. The economy is also populated by an unbounded pool of managers with heterogeneous ability m. At birth, each firm chooses a manager m, and the firm-manager match lasts for the entire lifetime of the firm.[21]

[21] As detailed in Section 2, only 6.64% of managers in the sample change firm, and the median number of managers that a

Firm managers do not directly affect output, but – consistent with the empirical evidence shown in Table 4 – we assume that they affect firms' fixed operating costs. This assumption implies that a manager is akin to a technology that affects a firm's output through the firm's returns to scale Lucas (1978).

If a firm's productivity and manager type (φ, m) are such that the firm makes non-negative domestic profits $\pi(\varphi, m) = \tilde{\pi}(\varphi) - f_D(m)$, where $f_D(m)$ denotes the fixed costs of domestic operations, then the firm operates in its domestic market. In addition, by paying a sunk cost $F > 0$, the firm may become an MNE and produce and sell in the foreign market as well.[22] The FDI production technology is identical to the one in the domestic country, but –consistent with Helpman et al. (2004)– we assume that it is subject to a higher fixed operating cost $f_I(m) > f_D(m)$, $\forall m$. Importantly, consistent with the evidence in Table 4, we assume that $f'_D(m) > 0$ and $f'_I(m) < 0$: the fixed costs of domestic operations (FDI) are increasing (decreasing) in managerial ability. Lastly, we assume that a firm hires only one manager, independently on its MN status. The firm manager handles operations in all the markets the firm is active.

Firms take wages as given as they decide their output level and FDI activity. For simplicity, we normalize wages in both countries: $w = w^* = 1$. We assume that, in each period, a portion $\delta > 0$ of firm's profits is distributed as dividend to the stockholders, $d(\varphi, m)$, while the remaining share $(1 - \delta)$ is the manager's compensation, $s(\varphi, m)$:

$$d(\varphi, m) = \delta \Pi(\varphi, m) \tag{8}$$

$$s(\varphi, m) = (1 - \delta)\Pi(\varphi, m) \tag{9}$$

where $\Pi(\varphi, m)$ denotes a firm's total profits.[23] A testable implication of this compensation structure is that $s(\varphi, m)$ is positively correlated with firm productivity (hence with MN status) and with measures of managerial ability. Appendix Table C.6 shows support for this prediction.

Shocks. The dynamics of the economy are driven by fluctuations in the aggregate consumption levels in the two countries. C and C^* are exogenously given and evolve according to:

$$\frac{dC}{C} = \mu dt + \sigma dz \tag{10}$$

$$\frac{dC^*}{C^*} = \mu^* dt + \sigma^* dz^*, \tag{11}$$

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

firm has during its life in the sample is 1.

[22] The model should be interpreted as one of horizontal FDI only, where FDI sales are entirely directed to the host market. Garetto et al. (2024) report that 72% of the sales of affiliates of US MNEs are directed to the host market.

[23] In principle, the share of firm's profits devoted to managerial compensation could be also a function of managerial ability. Appendix Table C.5 provides support for the assumption of a constant δ by showing that manager compensation over firm profits is virtually invariant with respect to manager characteristics. Our assumption on the structure of manager compensation is analogous to Lucas (1978), where $\delta = 0$.

two country-specific shocks. It follows that the stochastic discount factor is given by:[24]

$$\frac{dM}{M} = -rdt - \gamma\sigma dz, \tag{12}$$

where $r = \rho + \gamma\mu - \gamma(\gamma+1)\frac{1}{2}\sigma^2$ denotes the risk-free rate.

Like in Fillat and Garetto (2015), fluctuations in aggregate consumption levels are the source of risk in the economy. 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, as it will become clearer in Section 4.3. 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, and drives returns up, as we explain below.

4.2 The Firm's Intertemporal Problem

We set up the firm's intertemporal problem conditional on the ability of its manager. Then we present the optimal manager hiring decision.

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

Let $\mathcal{V}(\varphi, m, C, C^*)$ denote the value of a firm with productivity φ and managerial ability m 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:

$$\mathcal{V}(\varphi, m, C, C^*) = V_D(\varphi, m, C) + \max\{V_F^o(\varphi, m, C^*), V_F(\varphi, m, C^*)\}, \tag{13}$$

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. Next, we illustrate how each of the sub-value functions in equation 13 can be written recursively in a Bellman equation.

In the domestic market, a firm simply makes profits from domestic sales. Hence, its value is given by the share of its current profit that is distributed as a dividend flow, plus the continuation value:

$$V_D(\varphi, m, C) = \delta\pi(\varphi, m, C)M\Delta t + \{E[M\Delta t \cdot V_D(\varphi, m, C')]\}, \tag{14}$$

[24] 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 (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):

$$V_F^o(\varphi, m, C^*) = \max\left\{E[M\Delta t \cdot V_F^o(\varphi, m, C^{*\prime})], V_F(\varphi, m, C^*) - F\right\}. \tag{15}$$

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:

$$V_F(\varphi, m, C^*) = \delta\pi^*(\varphi, m, C^*)M\Delta t + \left\{E[M\Delta t \cdot V_F(\varphi, m, C^{*\prime})]\right\}. \tag{16}$$

For tractability, we assume that there is no endogenous exit from either the domestic or the foreign market.[25]

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:

$$V_D(\varphi, m, C) = \frac{\delta\tilde{\pi}(\varphi, C)}{r - \mu + \gamma\sigma^2} - \frac{\delta f_D(m)}{r}. \tag{17}$$

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

$$V_F(\varphi, m, C^*) = \frac{\delta\tilde{\pi}^*(\varphi, C^*)}{r - \mu^* + \gamma\chi\sigma\sigma^*} - \frac{\delta f_I(m)}{r}, \tag{18}$$

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

$$V_F^o(\varphi, m, C^*) = B^F(\varphi, m){C^*}^{\beta^*}, \tag{19}$$

[25]Introducing endogenous exit is conceptually straightforward, but implies 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 us from deriving closed-form solutions. While in the exposition of the model we dispense from firm exit entirely, in our quantitative analysis in Section 6 we introduce an exogenous exit rate, to prevent the share of MNEs from converging to 1.

where $B^F(\varphi, m)$ is the option value of becoming an MNE, and $\beta^* > 1$ is the positive root of the fundamental quadratic, $\frac{\sigma^{*2}}{2}\beta^{*2} + \left(\mu^* - \gamma\chi\sigma\sigma^* - \frac{\sigma^{*2}}{2}\right)\beta - r = 0$.

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. Given our assumptions on the fixed costs functions, managerial ability decreases (increases) the value of domestic (foreign) sales, and also affects the option value of MNE expansion, as we clarify below.

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 $V_F(\cdot)$:

$$\bar{C}^F(\varphi, m) = \left(\frac{\beta^*}{\beta^* - 1}\right)\left(\frac{\delta f_I(m) + rF}{r}\right)\left(\frac{r - \mu^* + \gamma\chi\sigma\sigma^*}{\delta A}\right)\varphi^{1-\eta}. \tag{20}$$

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 decreasing in managerial ability (since $f_I'(m) < 0$, indicating that firms with better managers need smaller positive demand shocks to enter foreign markets.

The value-matching and smooth-pasting conditions also deliver an expression for the option value of becoming an MNE, $B^F(\varphi, m)$:

$$B^F(\varphi, m) = \frac{1}{\beta^*}\left[\left(\frac{\beta^* - 1}{\beta^*}\right)\left(\frac{r}{\delta f_I(m) + rF}\right)\right]^{\beta^* - 1}\left(\frac{\delta A\varphi^{\eta-1}}{r - \mu^* + \gamma\chi\sigma\sigma^*}\right)^{\beta^*}. \tag{21}$$

Examining the dependence of the option value (21) 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, the option value of becoming an MNE is increasing in managerial ability.

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

Manager Choice. Each firm chooses its manager at birth, and the firm-manager match lasts for the entire lifetime of the firm. It is reasonable to assume that all firms are domestic at birth, so a firm with productivity φ chooses a manager m to maximize its value at birth:

$$\max_m \mathcal{V}(\varphi, m; C_0, C_0^*) = \frac{\delta\tilde{\pi}(\varphi, C_0)}{r - \mu + \gamma\sigma^2} - \frac{\delta f_D(m)}{r} + B^F(\varphi, m)C_0^{*\beta^*} \tag{22}$$

In choosing the optimal manager, firms experience a trade-off between their lifetime costs of domestic operations and the option value of foreign expansion. While a higher ability manager makes domestic

operations more costly (since $f'_D(m) > 0$), she also increases the option value of MN expansion, or the likelihood that the firm will have additional profits from FDI sales (since $f'_D(m) < 0$). Since the function $\mathcal{V}(\varphi, m; C_0, C_0^*)$ is supermodular in firm productivity and manager ability, the solution of this problem implies that higher productivity firms hire higher ability managers.[26]

Even if firm productivity and managerial ability are hard to measure, we can assess the empirical validity of this implication by looking at observables that are correlated with these variables. There is a large body of theoretical and empirical work showing that more productive firms tend to be larger than less productive firms, according to many measures of size (see, among others, Bernard et al. 2009). In addition, it is reasonable to expect a positive correlation between a manager's ability and her compensation (like we show in Table C.6, proxying managerial ability with our measure of managerial experience). Appendix Figure C.2 shows that there is a strong positive correlation between manager compensation (as a proxy for ability) and measures of firm size (as proxies for firm productivity). This evidence replicates an analogous finding in Terviö (2008) for the data in our sample.[27]

4.3 Stock Returns

We conclude our description of the model turning to one of the variables of interest of our empirical analysis, firm-level expected returns. In our model, fluctuations in aggregate consumption, coupled with agents risk-aversion, give rise to stock returns in excess of the risk-free rate. In a model without selection into MN status (and without fixed costs), the covariance of the cash flows with the stochastic discount factor would be the same for all firms, and equal to $\gamma\sigma^2$, so that all firms would have the same excess returns. In our model, the presence of fixed costs and selection into MN status puts a firm-specific "wedge" between firm revenues and firm profits, so that the covariance cash flows with the stochastic discount factor varies across firms, and so do the returns.

More precisely, in the model, the expected excess returns of a domestic firm and of a multinational firm can be written as:[28]

$$E[ret_D(\varphi, m, C, C^*)] - r = \frac{\gamma\sigma^2 C V'_D(\varphi, m, C) + \gamma\chi\sigma\sigma^* C^* V_F^{0'}(\varphi, m, C^*)}{\mathcal{V}_D(\varphi, m, C, C^*)}) \quad (23)$$

$$E[ret_{MN}(\varphi, m, C, C^*)] - r = \frac{\gamma\sigma^2 C V'_D(\varphi, m, C,) + \gamma\chi\sigma\sigma^* C^* V'_F(\varphi, m, C^*)}{\mathcal{V}_{MN}(\varphi, m, C, C^*)}.) \quad (24)$$

Through its effect on fixed costs, managerial ability affects the returns of both domestic firms and MNEs. Besides its effect on domestic sales, which is symmetric across firms, managerial ability affects the returns

[26] Problem (22) admits a unique solution provided that the value function is concave in m [**add exact condition here.**]

[27] Terviö (2008) explains the positive correlation between firm size and managerial compensation with an assignment model of firms and managers. While the qualitative results of that model are similar to ours, an assignment model wouldn't be suitable for our counterfactual analysis, as we explain in Section 6.

[28] The derivation of equations (23)-(24) is also contained in Appendix D.

of domestic firms through the option value of becoming a multinational ($V_F^{0'}(\cdot)$, which contains the term $B^F(\varphi, m)$), and it affects the returns of MNEs through the value of their profit flows, which enters $\mathcal{V}_{MN}(\cdot)$. In the next section, we provide a set of analytical results that clarify the implications of managerial ability for the expected stock returns of firms with different MN status.

5 Results: Management, Firm Status, and Stock Returns

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

Our first result speaks to the relationship between managerial ability and multinational entry.

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

Proof: Proposition 1 follows immediately by differentiating expression (20) with respect to m.

Since the fixed costs of foreign operations are decreasing in m ($f_I'(m) < 0$), firms with higher ability managers have lower costs of FDI, hence, keeping everything else equal, they need smaller positive shocks to enter foreign markets and are more likely to become MNEs. Model assumptions based on our empirical evidence on fixed costs (Table 4) deliver the effect of managerial ability on firm selection into multinational status that we observe in the data (Table 3).

We now examine the effect of managerial ability on the expected stock returns of domestic and multinational firms, respectively.

Proposition 2. *If* $\chi\sigma^* > \sigma$, *then* $\dfrac{\partial E[ret_D(\varphi, m)]}{\partial m} > 0$. *Domestic firms' risk premia depend positively on managerial ability.*

Proof: Differentiating expression (23) and noticing that $\partial B_F(\varphi; m)/\partial m > 0$, one obtains the result under the parameter restriction $\chi\sigma^* > \sigma$.

Managerial ability lowers the fixed costs of FDI and –as Equation (21) shows– it increases the option value of FDI. As a result, the curvature of the value function increases, and so does its covariance with the stochastic discount factor, and the firm expected returns. Domestic firms with a higher option value are more likely to exercise the entry option and become multinational. The stockholders forecast the higher likelihood of risky foreign operations, and command higher returns to be compensated for that risk.

We have shown that domestic firms that are run by higher ability managers are more likely to become MNEs (Proposition 1), hence they are the "model equivalent" to future MNEs in the data. Proposition

2 shows that domestic firms that are run by higher ability managers have higher expected stock returns. The two propositions together are then consistent with the future MNE premia that we have shown in our empirical analysis (see Table 5): future MNEs (in the model, domestic firms run by high ability managers, that have high option values of FDI), have higher returns than firms that sell only and always domestically.

How does managerial ability affect the returns of multinational firms? Our last proposition answers this question.

Proposition 3. *If* $-f_I'(m) > f_D'(m)$, *then* $\dfrac{\partial E[ret_{MN}(\varphi, m)]}{\partial m} < 0$.

Proof: Proposition 3 follows immediately by differentiating expression (24) with respect to m.

Proposition 3 states that the effect of managers on current MNE premia depends on the relative effect of managerial ability on the fixed costs of domestic versus foreign operations. If the effect of managerial ability on the fixed cost of FDI dominates, MNEs' risk premia depend negatively on managerial ability, and managerial ability reduces the premium differential between MNEs and domestic firms.

The intuition behind this result is simple: higher fixed costs increase operating leverage, making assets in place riskier (the mechanism that Fillat and Garetto (2015) use to explain the MNE premium). Managerial ability affects the fixed costs of firms. For MNEs, the effect of managerial ability increases (reduces) the fixed costs of domestic (foreign) operations, so the net effect on risk (and expected returns) depends on the net effect of managerial ability on total fixed costs.

Next, we show suggestive evidence that the mechanism highlighted in Propositions 2 and 3 is at play in the data.

5.1 Back to the Data: Managers and Firm Risk

Proposition 2 states that domestic firms with higher ability managers have higher returns than domestic firms with lower ability managers. Since managers' ability makes MN expansion more likely, those domestic firms with experienced managers are what we see in the data as future MNEs. Similarly, Proposition 3 states that current MNEs with higher ability managers have lower returns than MNEs firms with lower ability managers. Jointly, the two propositions suggest that managerial ability accounts for part of the MNE premium that is observed in the data.

To substantiate the mechanism of the model, Table 7 present the results of our returns on characteristics regressions including manager fixed effects. Column (1) of Table 7 shows the baseline characteristics regression (3), run on the smaller sample of firms for which we have executive information (the intersection of Compustat/CRSP, Execucomp, and Boardroom Alpha). 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. In particular, the current MNE premium is not present in this sample, while there is a

Table 7: Returns of Future MNEs: Management Matters

	(1)	(2)	(3)	(4)
Current Multinationals	0.159	-1.753	-1.346***	-1.469***
	(0.332)	(2.644)	(0.434)	(0.474)
Future Multinationals	0.859**	-0.237		
	(0.369)	(2.642)		
Constant	4.677***	3.329	3.390***	2.778***
	(0.343)	(2.300)	(0.492)	(0.544)
Firm FE	No	No	Yes	Yes
Executive FE	No	Yes	No	Yes
Observations	45,536	45,090	45,391	45,078
Adjusted R-squared	0.184	0.197	0.196	0.198
Current Minus Future MNE p-Val	0.002	0.005	0.002	0.002

Note: The dependent variable is quarterly firm-level stock returns. All specifications include market capitalization, leverage ratio, sales per employee, capital per employee, and the firm beta as controls, and 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.

sizable future MNE premium.

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. Moreover, 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 future multinationals compared to domestic firms. 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. There are two observations to be made. First, both firm and CEO fixed effects contribute to explain variation in stock returns. Second, the negative coefficient on the current MNE dummy implies that returns decline when firms enter foreign markets.[29]

[29] Appendix Figure C.3 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. To provide further support for the role of managers in affecting current and future MNEs' systematic risk, Appendix Table C.7 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.

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, and aggregate financial market outcomes. More precisely, our counterfactual analysis examines model-predicted effects of a policy that imposes a tax on the profits of firms with CEO to worker compensation ratios above a certain threshold[30]

We calibrate the model to match moments related to managerial characteristics, firm selection into FDI, and stock market variables. We then evaluate the effect of the policy by simulating a counterfactual version of the model where a tax is imposed on the profits of those companies that, in equilibrium, have a CEO to worker compensation ratio above a certain threshold.

6.1 Calibration

The calibration of the model entails setting values for parameters related to preferences (the subjective discount factor ρ, the elasticity of substitution η, and the risk aversion coefficient γ), shocks (the drifts μ, μ^*, standard deviations σ, σ^*, correlation coefficient χ, and initial values $C(0)$, $C^*(0)$), and technology (the parameters of the productivity distribution $G(\varphi)$ and of the fixed costs functions $f_D(m)$, $f_I(m)$, the sunk entry cost F, and the dividend share δ). We take some of these parameters from the literature or from direct observations in the data, and we calibrate the others using the structure of the model.

6.1.1 External Calibration

For the calibration of the aggregate shock processes, we follow the methodology in Fillat and Garetto (2015). We impose symmetric growth in the two countries, and choose the Brownian motion parameters to be equal to the mean and standard deviation of aggregate consumption growth in the US over the sample period: $\mu = \mu^* = 0.025$ and $\sigma = \sigma^* = 0.015$. To select a value for χ we computed correlations of GDP growth rates between the US and its main trading partners, and took the median value: $\chi = 0.45$.

We set the elasticity of substitution to $\eta = 5$, in line with estimates in the literature (e.g. Broda and Weinstein 2006), and the risk aversion parameter to $\gamma = 4$, a common and conservative choice in the asset pricing literature.

In the theoretical model, we assume that there is no exit of MNEs from the foreign market. Coupled with positive drifts of the Brownian motions, this assumption has the undesirable implication that –in the long run– all firms become multinational. In order to prevent this outcome, we assume that every period an exogenous share of firms dies and is replaced by new (domestic) firms drawn from the same productivity distribution $G(\varphi)$. For this reason, the subjective discount rate ρ in the theoretical model is replaced by

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

$\rho + \nu$, where ν is the exogenous exit rate. The sum $\rho + \nu$ needs to be such that the present discounted value of profits does not diverge: $r + \nu - \mu + \gamma\sigma^2 > 0$ and $r + \nu - \mu^* + \gamma\chi\sigma\sigma^* > 0$, where $r = \rho + \gamma\mu\gamma(\gamma+1)\frac{\sigma^{*2}}{2}$. We set $\nu = 0.02$, equal to the exit rate of MNEs in the data, and $\rho = 0.01$.

We assume that the distribution of firm productivity $G(\varphi)$ is Pareto with location parameter one and shape parameter $\vartheta = 4.25$, as calculated by Kondo et al. (2023) using Census data for US firms.

Lastly, we set the dividend share to $\delta = 0.96$, based on the observation that average manager compensation as a share of firm profits $(1 - \delta)$ is equal to 0.04 in our data.

Table 8 summarizes the parameters we set directly from the data or from previous literature.

Table 8: Direct Calibration.

Parameter	Definition	Value	Source
μ, μ^*	drift of demand processes	0.025	BEA
σ, σ^*	st. dev. of demand processes	0.015	BEA
χ	correlation of demand processes	0.45	WDI
η	elasticity of substitution	5	Broda and Weinstein (2006)
γ	risk aversion coefficient	4	
ρ	subjective discount factor	0.01	
ν	exit rate	0.02	Compustat
ϑ	shape parameter of firm productivity distribution	4.25	Kondo et al. (2023)
δ	dividend share of profits	0.96	Execucomp, Boardroom Alpha

6.1.2 Model-based Calibration

We set values for the remaining parameters using a procedure that identifies them jointly to match relevant moments from our data. We need to set values for the sunk MNE entry cost F, the initialization of the aggregate consumption processes C_0, C_0^*, and the parameters of the fixed costs functions $f_D(m)$, $f_I(m)$. We parameterize the fixed cost functions so that: i) their dependence on managerial ability is consistent with our empirical evidence in Table 4, and ii) the optimal manager choice problem admits a unique solution. To this end, we choose the following functional forms:

$$f_D(m) = c + dm \tag{25}$$

$$f_I(m) = ae^{-bm} \tag{26}$$

so that the calibration requires us to choose values for the four positive parameters a, b, c, and d, under the following technical restrictions:

$$F > (\beta^* - 1)\frac{\delta}{r}a \tag{27}$$

$$\beta^{*-\beta^*}(\beta^* - 1)^{\beta^*}\left(\frac{\delta A_0}{r - \mu^* + \gamma\chi\sigma\sigma^*}\right)^{\beta^*}\left(\frac{\delta a e^{-b} + rF}{r}\right)^{-\beta^*}(abe^{-b})C_0^{*\beta^*} > d. \tag{28}$$

Condition (27) ensures that the objective function of the optimal manager choice problem is concave, while condition (28) ensures the existence of a unique stationary point. Details on the derivation of these conditions are in Appendix D.

As a result of these assumptions, the joint calibration entails choosing values for the 7 parameters C_0, C_0^*, F, a, b, c, and d. To this end, we target the following moments: the average share of MNEs in the sample, the average MNE entry rate (that is, the average share of domestic firms that become MNE every period), the average stock returns of domestic firms and of MNEs, the elasticity of fixed cost to manager compensation for both domestic firms and MNEs, and the correlation between manager compensation and firm sales.

We compute the average share of MNEs in the sample and the average MNE entry rate from the Compustat data. For this reason, the share of MNEs in the sample, 48.99%, is much higher than in samples that are representative of the entire population of firms in a country, but it is in line with what reported by other papers using the same data (like Fillat and Garetto 2015). The MNE entry rate is 7.06%, similar to numbers reported by Garetto et al. (2024) using the BEA data. The correlation between manager compensation and firm sales is the slope of the regression line in the fight panel of Figure C.2, and is also similar to what Terviö (2008) finds with similar data but a different sample period. While the MNE entry rate is the main driver of identification of the sunk MNE entry cost F, the share of MNEs in the sample and the correlation between manager compensation and firm sales help pinning down the initial values of the aggregate consumption processes C_0, C_0^*.

The average stock returns moments, 4.37% for domestic firms and 6.21% for MNEs, respectively, are helpful in identifying the intercepts of the fixed costs functions, while the elasticities of fixed costs to manager compensation are intimately related to the slope of those functions. We compute the elasticities of fixed costs to manager compensation from the results of the fixed costs regressions in column (5) of Table C.4. While the elasticity of fixed costs to manager compensation for domestic firms readily comes from the regression coefficient, the one for MNEs is derived acknowledging that fixed costs in the data are an aggregate of the fixed costs of domestic operations and of the fixed costs of FDI:

$$\begin{aligned} f_D^{data}(m) &= constant + 0.612 \log w(m) \\ f_D^{data}(m) + f_I^{data}(m) &= constant - 0.035 \log w(m), \end{aligned}$$

which implies that:

$$f_I^{data}(m) = -0.647 \log w(m).$$

Table 9 summarizes the data moments we target, and the corresponding moments generated by the model ones.

Table 9: Joint Calibration.

	Data	Model
Av. share of MNEs	48.99%	
Av. MNE entry rate	7.06%	
Av. stock returns of domestic firms	4.37%	
Av. stock returns of MNEs	6.21%	
Corr. between manager compensation and firm sales	0.33	
Elasticity of fixed cost to manager compensation for domestic firms	0.612	
Elasticity of fixed cost to manager compensation for MNEs	-0.647	

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

In this section, we use our calibrated model to evaluate the effects of a policy whereby a tax is imposed on the profits of those companies that, in equilibrium, have a CEO to worker compensation ratio above a certain threshold.

To do so, we modify the model by imposing an exogenous constraint $\bar{s}$ to CEO compensation and a tax τ on the profits of firms for which the constraint binds, $s(\varphi, m) > \bar{s}$. The presence of the tax changes the optimal manager decision problem (22). To illustrate this, let $m(\varphi)$ denote the (unconstrained) optimal manager choice of a firm with productivity φ. If $s(\varphi, m(\varphi)) > \bar{s}$, the firm is constrained in its manager choice. Let $\bar{\varphi}$ be defined as: $s(\bar{\varphi}, m(\bar{\varphi})) = \bar{s}$, so that all firms with $\varphi > \bar{\varphi}$ are constrained.

A constrained firm may then choose its "second-best manager", or the m that solves (22) under a tax on profits, denoted as $m(\varphi; \tau)$, or alternatively, choose the highest ability manager that doesn't trigger the tax, that we denote with $\bar{m}(\varphi)$ and is defined by $s(\varphi, \bar{m}(\varphi)) = \bar{s}$.

Formally, let $\mathcal{V}^\tau(\varphi, m; C_0, C_0^*)$ denote the value at birth of a firm with productivity φ and manager m when a tax τ is imposed on its profits:

$$\mathcal{V}^\tau(\varphi, m; C_0, C_0^*) = \frac{(1-\tau)\delta\tilde{\pi}(\varphi, C_0)}{r - \mu + \gamma\sigma^2} - \frac{(1-\tau)\delta f_D(m)}{r} + B^F(\varphi, m; \tau) C_0^{*\beta^*} \tag{29}$$

where

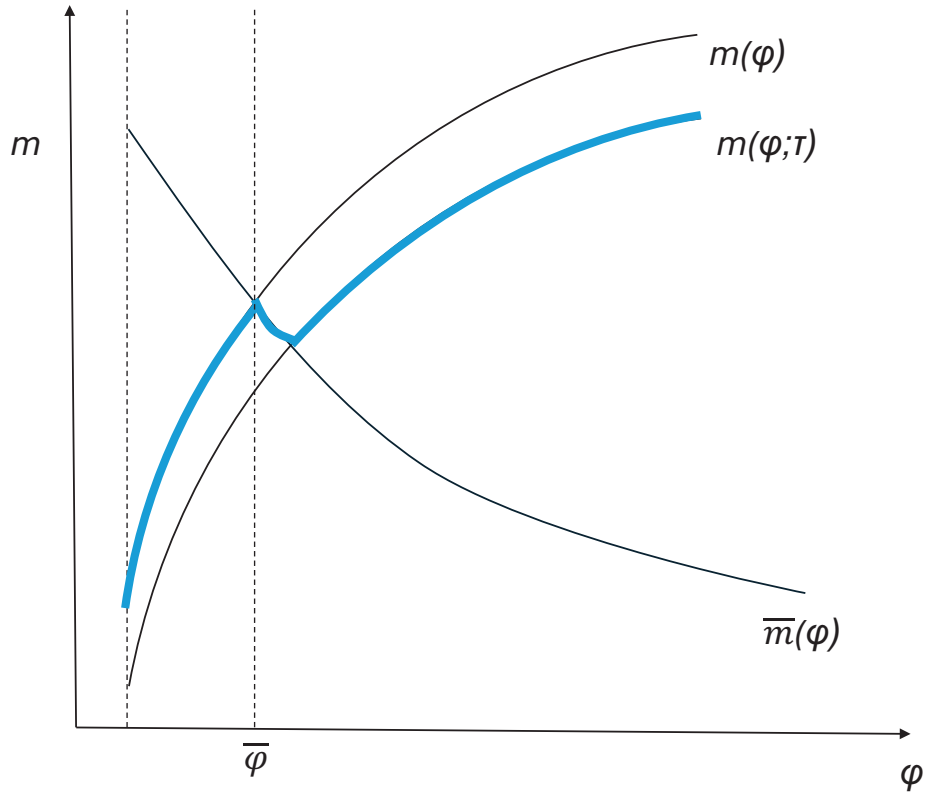
$$B^F(\varphi, m; \tau) = \frac{1}{\beta^*}\left[\left(\frac{\beta^* - 1}{\beta^*}\right)\left(\frac{r}{(1-\tau)\delta f_I(m) + rF}\right)\right]^{\beta^*-1}\left(\frac{(1-\tau)\delta A\varphi^{\eta-1}}{r - \mu^* + \gamma\chi\sigma\sigma^*}\right)^{\beta^*}. \tag{30}$$

Then the problem of a constrained firm is:

$$\max \left\{ \max_{m} \mathcal{V}^{\tau}(\varphi, m; C_0, C_0^*); \mathcal{V}(\varphi, \bar{m}; C_0, C_0^*) \right\}. \tag{31}$$

Figure 1 illustrates the manager hiring problem under a tax to CEO pay. The increasing curves in the figure represent the unconstrained manager choice, $m(\varphi)$ and the "second-best manager" choice, $m(\varphi;\tau)$. The decreasing curve represents the manager choice such that the constraint binds exactly, $\bar{m}(\varphi)$. The optimal hiring decision is outlined by the blue contour. Manager hiring decisions are unconstrained for lower productivity firms, while more productive firms face distortions to their optimal manager choices.

Figure 1: The effects of taxing CEO pay on manager hiring.



Since the optimal manager choice also affects multinational entry decisions, and the tax affects firms at the top of the productivity distribution, distortions to the optimal matching between managers and firms may deter MN entry of otherwise profitable firms, distorting the economy away from efficient entry.In addition, hiring and entry distortions induced by the tax shift the composition of the market portfolio, generating ambiguous effects on the aggregate equity premium.

We believe that these are unwanted (and unstudied) consequences of corporate taxes which are worthy of quantification.

[QUANTITATIVE 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. Since we believe that managers have an important role in the firms' decision making process, we focus on their role as drivers of firm expansion into foreign markets.

Our empirical analysis shows that management matters for firms' selection into multinational activity: firms run by managers with previous experience in MNE entry are more likely to become MNEs. In addition, current and future MNEs command a higher risk premium than domestic firms.

We developed a simple dynamic model of manager choice and MNE entry that rationalizes our empirical findings. The model posits a mechanism whereby managers' ability affects firms' expansion costs, the option value of expansion, and the exposure to risk of assets in place.

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.

Bernard, A. B., J. B. Jensen, and P. K. Schott (2009). Importers, exporters, and multinationals: a portrait of firms in the u.s. that trade goods. In T. Dunne, J.B. Jensen and M.J. Roberts (eds.), *Producer Dynamics: New Evidence from Micro Data*. Chicago: University of Chicago Press.

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 (2021). Trade policy uncertainty and stock returns. *Journal of International Money and Finance 119*.

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.

Broda, C. and D. E. Weinstein (2006). Globalization and the gains from variety. *Quarterly Journal of Economics 121*(2), 541–585.

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

Esposito, F. (2022). Demand risk and diversification through international trade. *Journal of International Economics 135*.

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., X. Ma, N. Ramondo, and L. Oldenski (2024). 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. (2021). 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*.

Kondo, I. O., L. T. Lewis, and A. Stella (2023). Heavy tailed but not Zipf: Firm and establishment size in the United States. *Journal of Applied Econometrics 38*(5), 767–785.

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.

Terviö, M. (2008). The difference that ceos make: An assignment model approach. *The American Economic Review 98*(3), 642–668.

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.

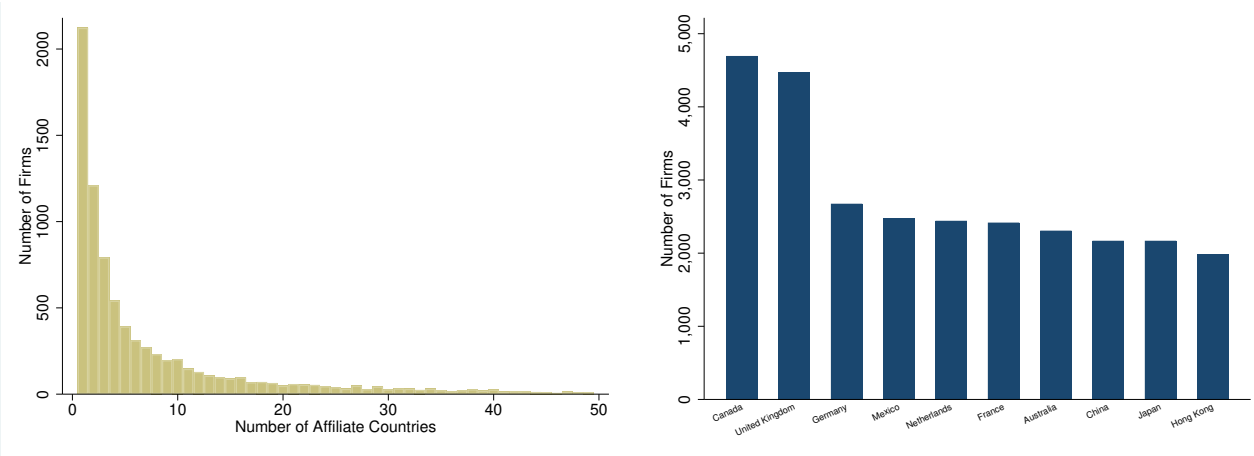
Thomson Reuters Mergers and Acquisitions Data provide deal-level M&A data for domestic firms from 1993 through 2017. Thomson Reuters M&A is an expansive platform for analyzing financial market, company fundamentals, and transaction deal data. We opt to exclude any deals that involve buybacks and recapitalizations 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

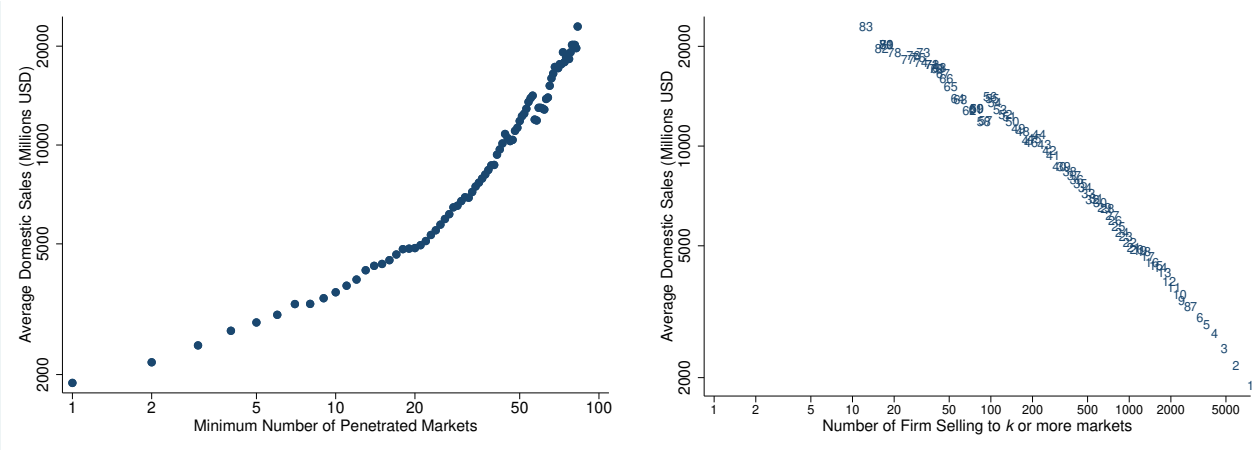
B Additional Data Description

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

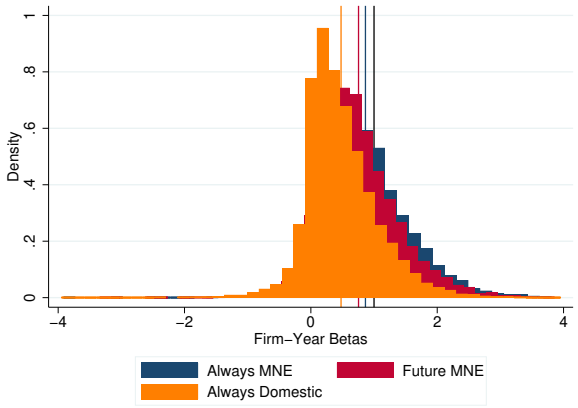
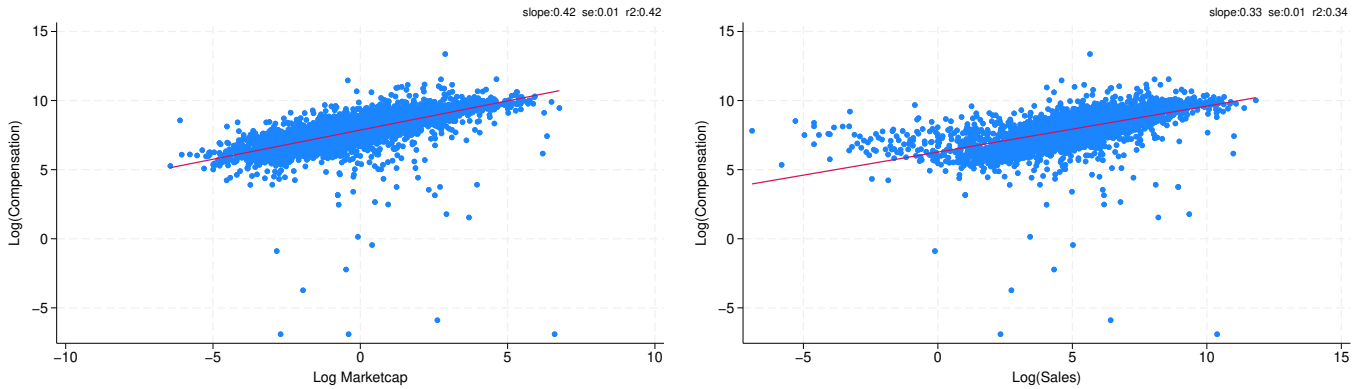


Figure C.1: Distribution of Firm *Betas*, by Firm International Status.

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.

Figure C.2: Manager Compensation and Firm Size



Note: Scatter plot of annual CEO compensation against measures of firm size: firm market capitalization in the left panel, and firm sales in the right panel. Year 2017.
Source: Execucomp, Boardroom Alpha, CRSP/Compustat.

Table C.1: Becoming a Multinational: Management Matters.

	(1)	(2)	(3)	(4)	(5)	(6)
Market Capitalization	0.002***	-0.000***	0.000***	-0.000***	-0.000***	-0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Leverage Ratio	0.133***	0.060***	0.036***	0.059***	0.060***	0.060***
	(0.012)	(0.015)	(0.013)	(0.010)	(0.015)	(0.015)
Sales/Employee	-0.000**	-0.000	-0.000	-0.000*	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Capital/Employee	-0.000**	-0.000	-0.000	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Beta (Annual)	0.108***	0.021***	0.024***	0.018***	0.021***	0.021***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Previous MNE transition experience					0.052***	
					(0.013)	
Number of country entries						0.006***
						(0.002)
Firm FE	No	Yes	No	Yes	Yes	Yes
Executive FE	No	No	Yes	Yes	No	No
Observations	133,519	133,519	133,519	133,519	133,519	133,519
Adjusted R-squared	0.149	0.701	0.741	0.759	0.701	0.701
F-test FE		$p < 0.0001$	$p < 0.0001$	$p < 0.0001$	$p < 0.0001$	$p < 0.0001$

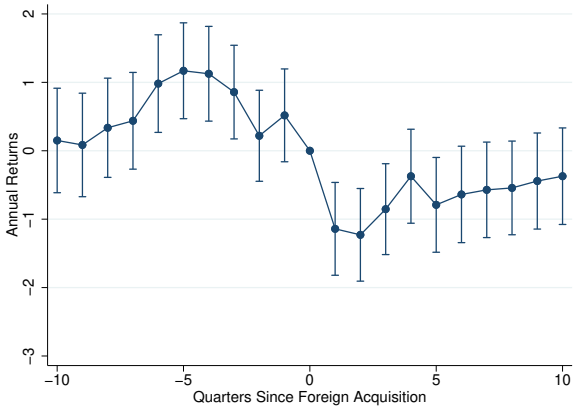
Note: The dependent variable is a dummy taking a value of 1 if a firm is a multinational in quarter-year t. The variable "Previous MNE transition experience" takes the value of 1 if the manager has prior experience in transitioning a firm from domestic to MNE. "Number of countries entries" denotes the natural log of 1 + the number of countries where previous 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, SEC 10-K filings, Execucomp, Boardroom Alpha.

Table C.2: Becoming a Multinational: Management Matters. Robustness.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Previous MNE transition experience		0.052***						0.049***
		(0.013)						(0.016)
Number of country entries			0.006***					-0.016***
			(0.002)					(0.004)
Previous MNE experience				0.034***				0.040***
				(0.006)				(0.011)
Age					0.002***			0.002***
					(0.000)			(0.000)
Log-compensation						0.008***		0.004***
						(0.001)		(0.001)
Stock option share							0.037***	0.031***
							(0.005)	(0.006)
Firm FE	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Executive FE	No	No	No	No	No	No	No	No
Observations	133,519	133,519	133,519	133,519	132,588	111,428	89,879	89,778
Adjusted R-squared	0.149	0.701	0.701	0.701	0.701	0.719	0.702	0.702
F-test FE		p < 0.0001	p < 0.0001	p < 0.0001	p < 0.0001	p < 0.0001	p < 0.0001	p < 0.0001

Note: The dependent variable is a dummy taking a value of 1 if a firm is a multinational in quarter-year t. The variable "Previous MNE transition experience" takes the value of 1 if the manager has prior experience in transitioning a firm from domestic to MNE. "Number of countries entries" denotes the natural log of 1 + the number of countries where previous 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, SEC 10-K filings, Execucomp, Boardroom Alpha.

Figure C.3: 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.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, World Management Survey.

Table C.4: Manager Characteristics and Fixed costs

	(1)	(2)	(3)	(4)	(5)	(6)
MNE	1.183***	1.178***	1.176***	0.923***	1.010***	0.498***
	(0.015)	(0.015)	(0.015)	(0.065)	(0.157)	(0.022)
Previous MNE transition experience	0.239***					
	(0.086)					
MNE x Previous MNE transition experience	-0.096					
	(0.098)					
Number of country entries		0.389***				
		(0.030)				
MNE x Number of country entries		-0.138***				
		(0.031)				
Previous MNE experience			0.524***			
			(0.053)			
MNE x Previous MNE experience			-0.119**			
			(0.057)			
age				-0.001		
				(0.001)		
MNE x Age				0.005***		
				(0.001)		
log_compensation					0.612***	
					(0.017)	
MNE x Log(compensation)					-0.035*	
					(0.020)	
stock_option_share						1.030***
						(0.029)
MNE x Share of Compensation in Stocks/Options						0.520***
						(0.035)
Observations	102,379	102,379	102,379	101,612	86,432	70,202
Adjusted R-squared	0.454	0.457	0.456	0.452	0.614	0.500
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Industry-Quarter FE"	Yes	Yes	Yes	Yes	Yes	Yes
Executive FE	No	No	No	No	No	No
Firm FE	No	No	No	No	No	No

Note: The dependent variable is firm-level fixed costs, measured as "Selling, General and Administrative Expense". The variable "Previous MNE transition experience" takes the value of 1 if the manager has prior experience in guiding another firm's transition from domestic to MNE. "Number of countries entries" denotes the natural log of 1 + the number of countries where previous 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, SEC 10-K filings, Execucomp, Boardroom Alpha.

Table C.5: Manager Compensation as a Share of Firm Profits

	Mean	Sd	Median	N
No Experience				
Manager's Total comp. over Firm EBITDA	0.17	0.31	0.08	128909
Manager's Cash comp. over Firm EBITDA	0.04	0.07	0.02	104681
Experienced				
Manager's Total comp. over Firm EBITDA	0.19	0.35	0.08	1262
Manager's Cash comp. over Firm EBITDA	0.04	0.05	0.02	914

Note: Firm profits as measured using the Compustat Variable 'EBITDA' (Earnings Before Interest, Taxes, Depreciation, and Amortization). Manager experience is defined as whether the CEO has facilitated an MNE transition before taking up their current role. Only showing firms with positive profits.
Source: CRSP/Compustat, SEC 10K filings, Execucomp, Boardroom Alpha.

Table C.6: Manager Compensation, Experience, and MN Status

	(1)	(2)	(3)	(4)
Manager w. previous MNE entry experience	0.294*** (0.034)		0.249*** (0.034)	0.079** (0.033)
MNE		0.562*** (0.008)	0.561*** (0.008)	0.064*** (0.009)
Firm FE	No	No	No	Yes
Observations	112,077	112,077	112,077	111,920
R-squared	0.153	0.187	0.187	0.717

Note: The dependent variable is annual CEO compensation. Sample years 1993-2005. All specifications include controls (market capitalization, leverage ratio, sales per employee, capital per employee, and the firm *beta*) and industry-quarter fixed effects. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1
Source: Execucomp, Boardroom Alpha, CRSP/Compustat, and SEC 10K filings.

Table C.7: 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 (14). This equation can be re-written as:

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

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:

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

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:

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

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 $B_3 = \frac{\delta A \varphi^{\eta-1}}{r-\mu-\gamma\sigma^2}$. 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 (17).

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 (18).

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:

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

This condition can be rewritten as:

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

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 (24).