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Relational Contracts and Global Sourcing

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Abstract

Relational contracts – informal agreements sustained by the value of future relationships – are integral parts of global production processes. This paper develops a repeated-game model of global sourcing in which final goods producers decide whether to engage with their suppliers in relational contracting and whether to integrate a supplier into a firm's boundaries or deal with the latter at arm's length. The model predicts that the likelihood of vertical integration increases in the long-term orientation of cooperation parties. Combining data from the U.S. Census Bureau's Related Party Trade database with measures for long-term orientation from Hofstede et al. (2010) and World Values Survey, I find empirical evidence supportive of this paper's key prediction. To better understand if the relationship is causal, I apply instrumental variables approach using genetic proxies and inherited components of long-term orientation as instruments. Taken together, the evidence suggests that the level of long-term orientation of the home and host country has a positive effect on the relative prevalence of vertical integration.

Keywords: Relational contracts, long-term orientation, international make-or-buy decision
JEL-Classifications: D02, D23, F14, F23, L22

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1 Introduction

When organizing production on a global scale, firms face the issue of contractual insecurity. In case of a dispute between cooperation parties, courts may be constrained in their ability to verify each party's deviation from the contract or unable to enforce verdicts upon subjects of different jurisdictions. Since an international arbitration process is also costly and time-consuming, firms often rely on relational contracts – informal long-term agreements sustained by the value of future relationship (Dixit 2004, MacLeod 2007). Yet, anecdotal evidence suggests that the ability of economic agents to engage in relational contracting hinges on their time preference rates, which systematically vary across countries.

One of the most widely documented examples in this context is the case study of two major automobile manufacturers, a Japanese corporation Toyota and an American enterprise General Motors (GM). The former is well known for making extensive use of relational contracts (see, e.g., Board 2011 and Gibbons and Henderson 2012). As attested in a comprehensive survey by Helper and Henderson (2014: 59), "as long as [Toyota's suppliers] make a good-faith effort to perform as they should, the assembler will ensure that they receive a reasonable return on their investment [...], and as long as the supplier continued to meet the automaker's expectations, the supplier could count on the relationship continuing indefinitely". In contrast, GM's cooperation with its suppliers is characterized by short-term – usually one-year – contracts focusing almost entirely on immediate financial results. The U.S. automobile manufacturer had been reportedly struggling to adopt its main competitor's relational governance approach, but with little success (see Helper and Henderson 2014). Business practitioners and academic researchers generally agree that GM's inability to imitate Toyota's organizational practices can be traced back to inherent differences in long-term orientation between Japanese and American managers.

Albeit anecdotal in its nature, the case study of Toyota vs. GM suggests a general research question: Do cross-country differences in long-term orientation, defined as the willingness of economic agents to forfeit instant gratification for the sake of long-term monetary benefits, have an impact on the organizational behavior of firms in those countries? This paper aims at shedding some light on this question by studying the effect of time discounting on the global organization of production. More specifically, I investigate how the level of long-term orientation affects a multinational firm's decision to integrate a foreign supplier into firm boundaries or cooperate with the latter at arm's length, thereby emphasizing the role of relational contracting. This paper argues, both theoretically and empirically, that the relative prevalence of vertical integration is increasing in the final good producers' and suppliers' levels of long-term orientation.

The model presented in this paper builds on the seminal theory of a multinational firm along the lines of Antràs and Helpman (2004) and embeds it into a repeated-game context suggested by Baker et al. (2002). The rationale behind this approach lies in the notion that business cooperations involving relationship-specific investments are the ones where long-term relationships may prevail. The mere possibility of a repeated interaction opens the door to relational contracting. More specifically, a final good producer and a supplier may commit at the outset to provide first-best investment levels in all subsequent periods of the game and sustain this agreement by the value of future relationship. It is well known from the Folk theorem, however, that the incentive compatibility of such an agreement crucially depends on both parties' time preference rates. More specifically, a final good producer and supplier are willing to engage in relational contracting only if both parties are sufficiently long-term oriented. If the relational agreement is not self-enforcing, parties negotiate in each period 'on the spot' regarding the division of surplus and are stuck with the hold-up problems well-known from Antràs and Helpman (2004). The latter type of cooperation will be referred to throughout as spot contracting.

Regardless of whether cooperation parties are able to enter a relational agreement or negotiate in every period on the spot, final good producers face the make-or-buy decision, i.e. choose whether to integrate a supplier into firm boundaries or source intermediate inputs at arm's length. Overall, this paper allows for four organizational modes: spot integration, spot outsourcing, relational integration and relational outsourcing. The make-or-buy decision under spot contracting is analogous to Antràs and Helpman (2004): A final good producer integrates (outsources) manufacturing production if the importance of manufacturing components in the production process is low (high, respectively). This result is in the spirit of the canonical Property Rights Theory of the firm along the lines of Grossman and Hart (1986) and Hart and Moore (1990): In order to minimize ex ante underinvestment, ownership rights over non-verifiable inputs are assigned to the party whose investment contributes relatively more to the value of the relationship.

The choice of the ownership form under relational contracting, however, serves a different purpose. Since parties implicitly agree to provide the first-best amount of relationship-specific inputs, final good producers no longer aim at incentivizing ex ante investment. Instead, the make-or-buy decision is made so as to minimize suppliers' incentives to renege on the relational agreement. The model shows that a supplier's deviation incentives under relational integration are lower than under relational outsourcing. Intuitively, if a final good producer possesses property rights over a supplier's assets, the supplier has a low bargaining position in case of a deviation from the relational agreement. Therefore, final good producers

under relational contracting strictly prefer integration over outsourcing.

Depending on both parties' time preference rates, a final good producer decides whether to enter a relational agreement or cooperate with a supplier on the spot. Given that final good producers engaged in relational contracting always source manufacturing inputs within firm boundaries, whereas those 'stuck' with spot contracting integrate a supplier only if the importance of manufacturing components in the production process is relatively low (and cooperate with the latter at arm's length otherwise), the model suggests the following key testable prediction: The prevalence of vertical integration is (weakly) increasing in the supplier's and final good producer's levels of long-term orientation.

I test this hypothesis by pooling together several datasets. To measure the relative prevalence of vertical integration, I follow the bulk of the recent empirical literature on multinational firm boundaries in using U.S. Census Bureau's Related Party Trade data.[1] More specifically, I use the share of U.S. intra-firm imports in total U.S. imports as the dependent variable. The independent variable is a country's index of long-term orientation, drawn from Hofstede et al. (2010). This score represents one of the five key cultural dimensions identified by Geert Hofstede to measure fundamental cultural differences and is generally recognized as a valid proxy for a country's time preference rate (see Galor and Özak 2014). As argued by Hofstede et al. (2010), individuals in countries with a high level of long-term orientation value persistence, perseverance, and are willing to delay short-term material gratification in favor of long-term benefits. In contrast, individuals in short-term oriented countries care more about immediate gratification than long-term fulfillment. In line with the paper's key prediction, I find a positive relationship between the share of U.S. intra-firm imports and a foreign country's long-term orientation score. Importantly, this association remains significant after controlling for a standard set of explanatory factors that have been suggested in empirical studies of the Property Rights Theory of a multinational firm.

Since the above-mentioned relationship can potentially be driven by unobserved heterogeneity across countries, and a country's long-term orientation might be endogenous to economic outcomes, the identification of a causal effect of long-term orientation on the make-or-buy decision calls for an instrumental variables approach. To provide valid instruments for a country's time preference rate, I exploit genetic data from Gorodnichenko and Roland (2011). More specifically, I construct two alternative measures of genetic distance between the population in a given country and the population in one of the most long-term oriented countries, Japan. Both measures are highly correlated with a country's current level of long-

[1] Given that comprehensive firm-level datasets on the international integration decisions are not readily available, this industry-level dataset has become a workhorse tool in empirical studies of international make-or-buy decisions, cf. Antràs (2013, 2015).

term orientation. This association can be rationalized in the light of recent literature, which argues that parents pass on not only their genes but also cultural traits to the offspring, see, e.g., Bisin and Verdier (2010) for an overview.[2] At the same time, since international make-or-buy decision is exogenous to a country's genetic characteristics, the instruments fulfill the exclusion restriction. Using these instruments, I find a positive effect of foreign suppliers' long-term orientation on the share of intra-firm imports from a given country.

In order to assess the effect of a final good producer's time preference rate on the relative prevalence of vertical integration, I construct a measure of long-term orientation that varies across U.S. sectors. For this purpose, I use information on ancestry from the 2000 U.S. Census to calculate the prevalence of managers and CEOs from a certain cultural background in a given industry. Weighing these ethnic shares with the long-term orientation scores of their ancestors' countries, I construct industry-specific indices of long-term orientation and merge them with the above-mentioned Related Party Trade data. In accordance with the model's prediction, I find a positive relationship between final good producers' long-term orientation levels and the share of intra-firm imports in a given industry. This association remains significant after including a standard set of control variables and correcting for unobserved cross-country variation using country and year fixed effects.

As a robustness check, I rerun the regressions using a country's level of trust as an alternative proxy for relational contracting. Since relational contracts are generally perceived as trust-based agreements (MacLeod 2007), a higher level of trust is arguably conducive to the emergence of implicit agreements between final good producers and their suppliers. The measure of trust is constructed using the well-known generalized trust question from the World Values Survey (see Guiso et al. 2010). In line with this paper's key theoretical prediction, I find that higher level of trust in the home and host country is associated with greater share of intra-firm imports. To better understand if this relationship is causal, I follow Algan and Cahuc (2010) in instrumenting the current level of trust by its inherent component. The instrumental variables estimates broadly confirm the OLS results, suggesting that a higher level of trust leads to more intra-firm trade.

Related literature. This paper is not the first to embed the static framework along the lines of Antràs and Helpman (2004) into a repeated game. Kukharskyy and Pflüger (2015) do so to study the effect of relational contracting on the economic well-being of nations. Unlike the current paper, however, the authors do not derive a clear empirical prediction regarding the effect of home and host country's long-term orientation on the international make-or-buy decision nor bring this prediction to the data.

[2] To be clear, this paper does *not* presuppose a causal relationship between genes and cultural attributes such as long-term orientation, but rather exploits the correlation between the two.

From the empirical perspective, this paper is related to the burgeoning literature that aims to better understand the effect of culture on international trade and foreign direct investment. Gorodnichenko et al. (2015) find a negative effect of cultural distance, measured as the difference in individualism scores, on intra-firm trade. Using historically motivated instrumental variables, Siegel et al. (2011, 2013) find a negative effect of egalitarianism distance, defined as the difference in the belief that all people are of equal worth and should be treated equally in society, on foreign direct investment flows, cross-national flows of bond and equity issuances, syndicated loans, and mergers and acquisitions. Guiso et al. (2009) construct a measure of bilateral trust between European countries and instrument it with religious, genetic, and somatic similarities to show that lower bilateral trust leads to less trade and less direct and portfolio investment between two countries. Using data from the Eurovision Song Context, Felbermayr and Toubal (2010) construct a measure of cultural proximity and show a strong positive effect of this measure on trade volumes. Yet, none of these empirical studies consider the effect of long-term orientation on intra-firm trade.

The remainder of the paper is structured as follows: Section 2 lays out the basic set up. Section 3 describes the make-or-buy decision under spot and relational contracting and derives the key testable prediction. Section 4 presents econometric evidence supporting this paper's key proposition. Section 5 concludes.

2 The set-up

The model economy consists of a home country, N, and $F \geq 1$ foreign countries, denoted by the subscript ℓ. Foreign countries ℓ differ regarding their production cost, geographical distance to N, and the time preference rate of their managers. Each country is populated by a unit measure of consumers, who are symmetric in terms of their utility functions. Each consumer is endowed with a unit of inelastically supplied labor. A subset of individuals also possess entrepreneurial abilities, which allow them to become firm managers.

Demand. Along the lines of Antràs and Helpman (2004), the utility function is assumed to be:

$$U = x_0 + \mu \sum_{j=1}^{J} \ln X_j \quad , \quad X_j = \left[\int x_j(v)^{\alpha} \mathrm{d}v \right]^{1/\alpha} \quad , \qquad \mu > 0 \ , \ 0 < \alpha < 1, \tag{1}$$

where x_0 is consumption of a homogenous good, X_j is an index of aggregate consumption of differentiated goods in sector j, and $x_j(v)$ denotes consumption of a differentiated variety v in this sector. Parameter μ measures the intensity of preferences for differentiated goods and α is a parameter related to the elasticity of substitution between any two varieties,

$\sigma = 1/(1-\alpha)$. The budget constraint reads $\sum_{j=1}^{J} P_j X_j + x_0 = Y$, where Y denotes a household's income, $P_j \equiv \left[\int p_j(v)^{1-\sigma} \mathrm{d}v\right]^{1/(1-\sigma)}$ is the price index of differentiated goods, and $p_j(v)$ represents the price of a single variety v in sector j. Utility maximization yields demand functions for the differentiated goods bundle, a single differentiated variety, and the homogenous good, respectively:[3]

$$X_j = \mu P_j^{-1} \quad , \quad x_j(v) = \mu p_j(v)^{-\frac{1}{1-\alpha}} P_j^{\frac{\alpha}{1-\alpha}} \quad , \quad x_0 = Y - \mu. \tag{2}$$

Production. The homogenous good is produced in both countries under constant returns to scale and perfect competition. Production of one unit of output requires a_N units of labor in home country and $a_\ell > a_N$ labor units in a foreign country ℓ (i.e. workers in N are assumed to be more productive than in any foreign country). This numéraire good is assumed to be costlessly traded, implying the same (unitary) price in all countries. Consequently, the model exhibits a constant wage differential between the home country and foreign destinations: $w_N > w_\ell \; \forall \; \ell$. For simplicity, I normalize the wage rate in N to unity, $w_N = 1$.

Production technology of differentiated varieties draws on Antràs and Helpman (2004). Provision of each variety v requires two relationship-specific inputs: headquarter services $h_j(v)$ and manufacturing components $m_j(v)$, supplied by headquarter firms H and manufacturing suppliers M, respectively. Each intermediate input is produced with one unit of labor per unit of output. These inputs are combined to final goods according to the following Cobb-Douglas production function:[4]

$$x_j(v) = \left(\frac{h_j(v)}{\eta_j}\right)^{\eta_j} \left(\frac{m_j(v)}{1-\eta_j}\right)^{(1-\eta_j)}, \tag{3}$$

where parameter $\eta_j \in (0,1)$ captures the relative importance of headquarter services (henceforth, headquarter intensity) in the production process of sector j.

Establishment of a firm (H or M) requires one entrepreneur as a fixed cost. Each entrepreneur is an owner-manager of the unit and reaps this unit's operating profit. As in Antràs and Helpman (2004), provision of headquarter services occurs strictly in N. Manufacturing suppliers, however, are located in foreign countries.[5] I assume that final assembly of

[3] I assume sufficiently small preferences for differentiated goods (i.e., $\mu < Y$) to ensure positive consumption of the homogenous good in equilibrium.

[4] For simplicity, I refrain from modeling firm heterogeneity regarding productivity. However, this feature can be easily introduced into the current framework along the lines of Antràs and Helpman (2004) without qualitatively affecting its main results.

[5] This model can be easily extended by assuming that M are located both in N and F and allowing H to choose between domestic and foreign sourcing, cf. Antràs and Helpman (2004). However, given that domestic sourcing is not observable in the dataset used in the empirical part of the paper, it is ruled out at the outset.

manufacturing components and headquarter services into final goods takes place in N. International trade in manufacturing components is costly, as $\tau_\ell > 1$ units of m need to be shipped from a foreign country ℓ for one unit to arrive in N. Similarly, shipment of final goods from N to ℓ is associated with identical iceberg transport cost, $\tau_\ell > 1$. Given the mill (fob.) price of final goods, $p_{Nj}(v)$, the price paid by consumers in foreign country ℓ is $p_{\ell j}(v) = \tau_\ell p_{Nj}(v)$. Due to a symmetry of final good producers, the price indices prevailing in N and ℓ can be expressed as $P_{Nj} = (n_{Nj})^{-\frac{1-\alpha}{\alpha}} p_{Nj}(v)$ and $P_{\ell j} = \tau_\ell P_{Nj}$, respectively, where n_{Nj} represents the number of final good producers in sector j. Combining these results with equation (2), yields total output of variety v, $x_j(v) = \mu p_{Nj}(v)^{-\frac{1}{1-\alpha}} P_{Nj}^{\frac{\alpha}{1-\alpha}} + \sum_\ell \tau_\ell \mu \left(\tau_\ell p_{Nj}(v)\right)^{-\frac{1}{1-\alpha}} \left(\tau_\ell P_{Nj}\right)^{\frac{\alpha}{1-\alpha}}$. Using this expression together with (3) and the fact that $P_{Nj} = \mu X_{Nj}^{-1}$ yields total revenue from the final goods production:

$$R_j(v) = \left(\frac{h_j(v)}{\eta_j}\right)^{\alpha\eta_j} \left(\frac{m_j(v)}{1-\eta_j}\right)^{\alpha(1-\eta_j)} \mu F^{1-\alpha} X_{Nj}^{-\alpha}. \tag{4}$$

The revenue positively depends on the preference parameter, μ, the number of foreign countries F a good is supplied to and the aggregate demand level, X_{Nj}, which is exogenous from the viewpoint of a single producer, but determined endogenously in the industry equilibrium. To save on notation, I drop the variety index v and the sector index j from now on.

Contractual environment and organizational form. As in Antràs and Helpman (2004), the setting is one of incomplete contracts. Courts cannot verify the quality of intermediate inputs, and cooperating parties cannot sign ex ante enforceable contracts specifying the purchase of relationship-specific manufacturing components for a certain price. Against the backdrop of contractual incompleteness, a headquarter decides whether to integrate (I) the manufacturing supplier into firm boundaries or to outsource (O) manufacturing production to an independent supplier. The ex ante stipulated organizational form, $k \in \{I, O\}$ is verifiable and enforceable by the courts.

In contrast to the one-shot game in Antràs and Helpman (2004), firms in the current model interact repeatedly. This alternative assumption aims at capturing the notion that business cooperations involving relationship-specific investments are the ones where long-term relationships predominate. It is well-known from the literature on repeated games (Baker et al. 2002) that the threat of discontinuing a long-term relationship may ensure some cooperation despite contractual incompleteness. However, the ability of cooperating parties to sustain a long-term cooperation depends on their time preference rates. Let $\delta_N \equiv 1/(1+d_N)$ denote the discount factor of a headquarter manager and $\delta_\ell \equiv 1/(1+d_\ell)$ the discount factor of a supplier manager in country ℓ, whereby d_N and d_ℓ represent the

respective rates of time preference (discount rates). The time preference rates in each country are distributed according to a distribution function $\Gamma(d)$. To accord with the empirical evidence presented below, I assume that the mean of these distribution functions differs across countries. In words, individuals in some countries are (on average) more long-term oriented than in others.

The game begins with the headquarters choosing locations ℓ for production of manufacturing inputs. In each foreign destination, the headquarters are matched with suppliers and cooperation parties discover the time preference rates of their respective counterparts. Depending on the revealed long-term orientation of the supply manager, H chooses one of the two governance modes: spot (s) vs. relational (r) contracting. Under a spot contract, parties bargain in each period with regard to the compensation of relationship-specific investments. This ex-post negotiation process takes place via Nash bargaining, whereby H obtains a fraction $\beta_k \in (0,1)$ of the revenue. Following Antràs and Helpman (2004), I assume that headquarters obtain a greater share of surplus under vertical integration compared to outsourcing, $\beta_I > \beta_O$. The intuition behind this assumption stems from the canonical Property Rights Theory of the firm along the lines of Grossman and Hart (1986): Integration gives H residual control rights over M's inputs, which in turn enhances the former's bargaining position and increases H's ex post fraction of the revenue.

Under relational contracting, final good producers and their suppliers enter at the outset an informal agreement to provide the first-best level of inputs in all subsequent periods of the game. Furthermore, H commits to compensate M with an ex-post bonus B_k if the latter honors this agreement.[6] However, since the quality of relationship-specific investment is not verifiable, such an agreement cannot be enforced by the courts. Hence, a supplier may renege on the relational contract by ex ante underinvesting in manufacturing components. Similarly, a headquarter may provide a suboptimal level of headquarter activities and refuse to transfer the promised bonus to the supplier. In case any party reneges on the implicit contract, the implicit agreement is broken and the surplus in this period is shared according to the above-mentioned Nash-bargaining (with H obtaining a fraction β_k of the revenue). It is assumed that neither of the current partners can enter into a new relational agreement with a third party. In other words, in case of a deviation from a relational agreement in one period, both parties are 'punished' by non-cooperation and zero profits in all future periods.[7]

Timing. Under a governance mode $g \in \{s,r\}$ and ownership form $k \in \{I,O\}$, the timing of events in a single period (product cycle) of the game can be summarized as follows.

[6] As will be shown below, equilibrium bonus depends on the choice of the organizational form $k \in \{I,O\}$.

[7] This 'grim trigger' strategy can be justified by assuming a Commercial Registry, which contains information on all business relationships and is common knowledge for all market participants.

If H selects spot contracting (s), the consequent timing reads:

s_1: H and M simultaneously and independently invest in h_k and m_k, respectively.

s_2: Headquarters and suppliers negotiate about the division of surplus, whereby H obtains the fraction β_k of the revenue.

s_3: Final goods are produced and sold. The revenue is distributed between parties according to the sharing rule negotiated in s_2.

If H selects relational contracting (r), the consequent timing reads:

r_1: Both parties commit to provide the first-best level of non-contractible inputs h_k and m_k. H commits to pay a bonus B_k to M, if the latter sticks to this agreement.

r_2: H and M simultaneously invest in h_k and m_k as agreed in r_1.

r_3: The final goods are produced and sold. The revenue is distributed between parties according to the compensation rule agreed upon in r_1.

The product cycle stated above is repeated in all future periods of the game, $t = 1, ..., \infty$. The following section solves this game by backward induction.

Before describing the equilibrium of the game, it is worth pausing to briefly discuss this paper's assumption regarding the surplus sharing between two parties. Notice that the timing specified above does not include ex ante lump-sum transfers, commonly assumed in the literature to ensure that the entire surplus from cooperation accrues to headquarters, see Antràs and Helpman (2004, 2008). As asserted by Antràs and Staiger (2012: 3148), "the feasibility of these transfers is particularly hard to defend in the international context [...], where such transfers and the obligations associated with them might be difficult to enforce." However, I show in Appendix A.3 that this paper's main results are robust to allowing for the ex-ante transfers.

3 Optimal organizational structure

3.1 Spot governance

To characterize the subgame perfect equilibrium of the game described above, consider first date s_2 under spot contracting. At this stage, H chooses h to maximize $\beta_k R(h,m) - h$, whereas M picks m to maximize $(1-\beta_k)R(h,m) - w_\ell \tau_\ell m$. Using (4), this maximization problem yields equilibrium investment levels

$$h^s_{k\ell} = \beta_k \eta \alpha R^s_{k\ell} \quad , \quad m^s_{k\ell} = (1-\beta_k)\left(\frac{1-\eta}{w_\ell \tau_\ell}\right)\alpha R^s_{k\ell}, \tag{5}$$

and the associated revenue under spot contracting

$$R^s_{k\ell} = \left(\beta_k^\eta (1-\beta_k)^{(1-\eta)}\right)^{\frac{\alpha}{1-\alpha}} (w_\ell \tau_\ell)^{-\frac{\alpha(1-\eta)}{1-\alpha}} A, \tag{6}$$

where $A \equiv \mu^{\frac{1}{1-\alpha}} \alpha^{\frac{\alpha}{1-\alpha}} F X_N^{-\frac{\alpha}{1-\alpha}}$ has been defined for notational simplicity. Using (5) and (6) in maximization problems above, we obtain H's and M's profits under spot contracting

$$\begin{aligned} \pi^s_{Hk\ell} &= \beta_k \left(\beta_k^\eta (1-\beta_k)^{(1-\eta)}\right)^{\frac{\alpha}{1-\alpha}} (w_\ell \tau_\ell)^{-\frac{\alpha(1-\eta)}{1-\alpha}} A(1-\alpha\eta), \\ \pi^s_{Mk\ell} &= (1-\beta_k) \left(\beta_k^\eta (1-\beta_k)^{(1-\eta)}\right)^{\frac{\alpha}{1-\alpha}} (w_\ell \tau_\ell)^{-\frac{\alpha(1-\eta)}{1-\alpha}} A(1-\alpha(1-\eta)). \end{aligned} \tag{7}$$

Consider next the choice of organizational form in s_1. A headquarter decides to cooperate with a supplier under spot integration rather than spot outsourcing whenever

$$\Theta^s_H(\eta) \equiv \frac{\pi^s_{HI\ell}}{\pi^s_{HO\ell}} = \frac{\beta_I}{\beta_O} \frac{\left(\beta_I^\eta (1-\beta_I)^{(1-\eta)}\right)^{\frac{\alpha}{1-\alpha}}}{\left(\beta_O^\eta (1-\beta_O)^{(1-\eta)}\right)^{\frac{\alpha}{1-\alpha}}} \tag{8}$$

is larger than one. I prove in Appendix A.1 that the relative attractiveness of spot integration, as measured by $\Theta^s_H(\eta)$, is increasing in the headquarter intensity η. The intuition behind this result stems from the Property rights theory of the firm: If a supplier's contribution the production process becomes less important, the need for incentivizing M's ex ante investment via outsourcing decreases. Furthermore, Appendix A.1 proves that integration dominates outsourcing for high enough headquarter intensities, i.e. $\Theta^s_H(\eta = 1) > 1$. For low headquarter intensities, however, outsourcing dominates integration if and only if $1 - \beta_I < \alpha$. Intuitively, if a supplier's revenue share under integration is sufficiently low, headquarters in sectors with greater importance of manufacturing inputs relinquish control over these inputs in order to restore M's investment incentives (recall that $1 - \beta_O > 1 - \beta_I$). In order to allow for the coexistence of both organizational form, this paper imposes

Assumption 1. $1 - \beta_I < \alpha$.

Under this assumption, we have

Lemma 1. There exists a unique headquarter intensity $\hat{\eta} \in (0, 1)$, such that headquarter profit is higher under spot outsourcing for $\eta < \hat{\eta}$ and higher under spot integration for $\eta > \hat{\eta}$.

Proof. See Appendix A.1.

Although this result is well-known from Antràs and Helpman (2004), it can be considered as complementary given that it does not rely on the assumption of ex-ante transfers. In other words, while the organizational form in the original contribution is chosen so as to maximize *joint* profit from cooperation, headquarters in the current model choose the ownership structure which maximizes their own *fraction* of profits under spot contracting.

3.2 Relational governance

3.2.1 Equilibrium path

When H and M enter a relational contract, they implicitly agree to provide the level of investment that maximizes joint firm profit $\pi(h,m) = R(h,m) - h - w_\ell \tau_\ell m$. Using (4), this maximization problem yields equilibrium investment levels and the associated revenue:

$$h^r_{k\ell} = \eta\alpha R^r_{k\ell} \quad , \quad m^r_{k\ell} = \left(\frac{1-\eta}{w_\ell \tau_\ell}\right)\alpha R^r_{k\ell} \quad , \quad R^r_{k\ell} = (w_\ell \tau_\ell)^{-\frac{\alpha(1-\eta)}{1-\alpha}} A. \tag{9}$$

Comparing these results with (5), it immediately follows that investment levels under relational contracting are higher than under spot governance, i.e. $h^r_{k\ell} > h^s_{k\ell}$ and $m^r_{k\ell} > m^s_{k\ell}$. Intuitively, a relational contract eliminates the hold-up problem associated with ex post bargaining and provides higher ex ante investment incentives compared to spot contracting. This immediately implies a higher revenue under relational governance mode, $R^r_{k\ell} > R^s_{k\ell}$. Given that $h^r_{k\ell}$ and $m^r_{k\ell}$ maximize joint firm profit, they will be referred to as first-best investment levels in what follows. If a supplier provides the first-best level of manufacturing components, $m^r_{k\ell}$, the headquarter compensates him with a bonus $B_{k\ell}$ and both parties' profits are given by $\pi^r_{Hk\ell} = R^r_{k\ell} - h^r_{k\ell} - B_{k\ell}$ and $\pi^r_{Mk\ell} = B_{k\ell} - w_\ell \tau_\ell m^r_{k\ell}$, respectively. Using (9) therein, profits on the equilibrium path under relational contracting read

$$\begin{aligned} \pi^r_{Hk\ell} &= (w_\ell \tau_\ell)^{-\frac{\alpha(1-\eta)}{1-\alpha}} A(1-\alpha\eta) - B_{k\ell}, \\ \pi^r_{Mk\ell} &= B_{k\ell} - \alpha(1-\eta)(w_\ell \tau_\ell)^{-\frac{\alpha(1-\eta)}{1-\alpha}} A. \end{aligned} \tag{10}$$

If the relational contract is self-enforcing, there exits a bonus $B_{k\ell}$ which ensures both parties' non-negative profits in equilibrium. As will be shown in the next section, this equilibrium bonus crucially depends on a supplier's profits on the deviation path.

3.2.2 Off-the-equilibrium path

Since a relational contract is implicit and not verifiable by the courts, each party may renege on it. Consider first a supplier's deviation (D) incentives. M can renege on the relational agreement by delivering a sub-optimal level of manufacturing inputs, $m < m^r_{k\ell}$. In this case, the relational contract is broken and the distribution of this period's revenue between H and M occurs according to ex post bargaining with exogenous shares β_k and $(1-\beta_k)$, respectively. M's maximization problem on the deviation path reads $\max_m (1-\beta_k) R(h^r_{k\ell}, m) - m$, whereby $h^r_{k\ell}$ is H's first-best level of headquarter services from (9). This maximization problem implies

the following investment level and revenue:

$$m_{k\ell}^D = (1-\beta_k)\left(\frac{1-\eta}{w_\ell \tau_\ell}\right)\alpha R_{k\ell}^D \quad , \quad R_{k\ell}^D = (1-\beta_k)^{\frac{\alpha(1-\eta)}{1-\alpha(1-\eta)}}\left(w_\ell \tau_\ell\right)^{-\frac{\alpha(1-\eta)}{1-\alpha}} A. \tag{11}$$

A simple comparison of (11) and (9) implies a lower supplier investment on the deviation path as compared to the first best level, i.e. $m_{k\ell}^D < m_{k\ell}^r$.[8] Utilizing (11) in M's maximization problem, a supplier's equilibrium profit on the deviation path reads:

$$\pi_{Mk\ell}^D = (1-\beta_k)^{\frac{1}{1-\alpha(1-\eta)}}\left(w_\ell \tau_\ell\right)^{-\frac{\alpha(1-\eta)}{1-\alpha}} A(1-\alpha(1-\eta)). \tag{12}$$

Given the trigger strategy specified above, a supplier can reap these deviation profits only once and is 'punished' by non-cooperation in future periods of the game. A supplier honors the relational contract whenever the present value of his profits under relational contracting, $\pi_{Mk\ell}^r + \sum_{t=1}^{\infty}\left(\frac{1}{1+d_\ell}\right)^t \pi_{Mk\ell}^r = \pi_{Mk\ell}^r + \frac{\pi_{Mk\ell}^r}{d_\ell}$, is larger than his one-shot deviation profit, $\pi_{Mk\ell}^D$. M's incentive compatibility constraint (ICC_M) thus reads:

$$\pi_{Mk\ell}^r + \frac{\pi_{Mk\ell}^r}{d_\ell} \geq \pi_{Mk\ell}^D, \tag{13}$$

whereby $\pi_{Mk\ell}^r$ and $\pi_{Mk\ell}^D$ are given by (10) and (12), respectively. As long as this ICC_M is fulfilled, there exists a bonus $B_{k\ell}$ which induces the supplier's first-best investment in perpetuity. The headquarter has an incentive to stipulate the smallest possible bonus, which still fulfills the ICC_M. Manipulating (13), this bonus can be expressed as

$$B_{k\ell} = \left(w_\ell \tau_\ell\right)^{-\frac{\alpha(1-\eta)}{1-\alpha}} A\left[\alpha(1-\eta) + \frac{d_\ell}{1+d_\ell}(1-\beta_k)^{\frac{1}{1-\alpha(1-\eta)}}(1-\alpha(1-\eta))\right]. \tag{14}$$

Utilizing (14) in (10), yields per-period profits of H and M on the equilibrium path under relational contracting:

$$\begin{aligned}
\pi_{Hk\ell}^r &= \left(w_\ell \tau_\ell\right)^{-\frac{\alpha(1-\eta)}{1-\alpha}} A\left[(1-\alpha) - \frac{d_\ell}{1+d_\ell}(1-\beta_k)^{\frac{1}{1-\alpha(1-\eta)}}(1-\alpha(1-\eta))\right], \\
\pi_{Mk\ell}^r &= \left(w_\ell \tau_\ell\right)^{-\frac{\alpha(1-\eta)}{1-\alpha}} A\left[\frac{d_\ell}{1+d_\ell}(1-\beta_k)^{\frac{1}{1-\alpha(1-\eta)}}(1-\alpha(1-\eta))\right].
\end{aligned} \tag{15}$$

Notice that a supplier's profit is non-negative for all parameter values (i.e. M's participation

[8] A tedious but straightforward analysis shows that supplier's investment on the deviation path is higher than under spot contracting, i.e. $m_{k\ell}^D > m_{k\ell}^s$. The result stems from the complementarity of inputs m and h and the fact that H's investment under relational agreement is higher than under spot contracting.

constraint may be ignored). A headquarter's profit, however, is positive if and only if

$$(1-\alpha) > \frac{d_\ell}{1+d_\ell}(1-\beta_k)^{\frac{1}{1-\alpha(1-\eta)}}(1-\alpha(1-\eta)) \tag{16}$$

As shown in Appendix A.2, this condition crucially depends on three factors.[9] First, it is more likely to hold the lower headquarter intensity, η. Intuitively, when H's contribution to the relationship is low, M can hardly exert ex post hold-up and the supplier's incentives to renege on the relational agreement decrease. Second, this condition is more likely to be fulfilled the lower the d_ℓ, i.e. the more long-term oriented a supplier. Intuitively, as the long-term orientation of a supplier increases, ICC_M can be satisfied with a smaller bonus and H's profits from relational contracting increase. Finally, condition (16) is more likely to hold the higher a headquarter's share of surplus from ex post bargaining, β_k. Intuitively, a higher β_k reduces M's bargaining position on the deviation path and decreases the latter's one-shot deviation incentives, see (12). Since $\beta_I > \beta_O$, the ICC_M under relational integration can be satisfied with a smaller equilibrium bonus compared to relational outsourcing, $B_{I\ell} < B_{O\ell}$. This immediately implies

Lemma 2. Headquarters strictly prefer relational integration over relational outsourcing. A headquarter is more likely to offer a relational contract to a supplier the higher the latter's level of long-term orientation and the higher a supplier's contribution to the relationship.

Proof. See Appendix A.2.

The key implication of Lemma 2 is that headquarters offer relational contracts only to integrated suppliers. Relational integration by itself, however, is not yet a sufficient condition for an incentive compatibility of the implicit agreement, since headquarters may as well deviate from it. A headquarter reneges on the relational agreement by underinvesting in h and refusing to provide the ex post bonus $B_{I\ell}$. H's maximization problem on the deviation path reads $\max \beta_I R(h, m^r_{I\ell}) - h$, whereby $m^r_{I\ell}$ is the first-best level of headquarter services from (9). This maximization problem implies the following investment and revenue on H's deviation path:

$$h^D_{I\ell} = \beta_I \eta \alpha R^D_{I\ell} \quad , \quad R^D_{I\ell} = \beta_I^{\frac{\alpha\eta}{1-\alpha\eta}}(w_\ell \tau_\ell)^{-\frac{\alpha(1-\eta)}{1-\alpha}} A. \tag{17}$$

A simple comparison of (17) and (9) implies a lower headquarter investment on the deviation path as compared to the first best level, i.e. $h^D_{I\ell} < h^r_{I\ell}$.[10] Utilizing (17) in H's maximization

[9] The effect of α on this inequality is ambiguous.

[10] As in the case of a supplier's deviation (see footnote 8), complementarity of inputs implies higher headquarter's investment on the deviation path compared to spot contracting, i.e. $h^D_{I\ell} > h^s_{I\ell}$.

problem, a headquarter's profit on the deviation path reads:

$$\pi^D_{HI\ell} = \beta_I^{\frac{1}{1-\alpha\eta}} (w_\ell \tau_\ell)^{-\frac{\alpha(1-\eta)}{1-\alpha}} A(1-\alpha\eta). \tag{18}$$

A headquarter complies to the relational integration contract if and only if the following incentive compatibility constraint is fulfilled:

$$\pi^r_{HI\ell} + \frac{\pi^r_{HI\ell}}{d_N} \geq \pi^D_{HI\ell}, \tag{19}$$

whereby $\pi^r_{HI\ell}$ and $\pi^D_{HI\ell}$ are given by (15) and (18), respectively. It can be easily shown that a supplier is willing to participate in relational contracting only if this ICC_H is fulfilled. Otherwise, parties play a non-cooperative game discussed in section 3.1.

The headquarter intensity η affects the ICC_H from (19) via two channels. On the one hand, a decrease in η is associated with lower M's deviation incentives and, thereby, higher H's profits on the equilibrium path (cf. Lemma 2). Other things being equal, this effect increases the left-hand side of ICC_H. On the other hand, it is straightforward to show that a lower η is associated with a higher $\pi^D_{HI\ell}$, which ceteris paribus increases the right-hand side of ICC_H. The intuition behind the latter effect is similar to the one provided in Lemma 2. When M's contribution to the relationship is relatively high (i.e., η is low), a headquarter can easily hold-up a supplier ex post and, therefore, H's deviation incentives increase. It can be shown that the overall effect of η on ICC_H depends on parameter values and cannot be assigned without ambiguity. Yet, it immediately follows from (19) that lower d_N makes relational integration self-enforcing for a greater range of parameter values. We thus have

Lemma 3. A supplier is more likely to accept a relational integration contract offered by a headquarter the higher the latter's long-term orientation.

Proof. Results immediately from (19).

3.3 Equilibrium governance mode

Having calculated the equilibrium profits under relational and spot contracting, we can turn to the headquarter's choice of the optimal governance mode and its implication for the international make-or-buy decision. As shown in the previous section, final good producers engaged in relational contracting strictly prefer integration over outsourcing. Under spot contracting, headquarters self-select into integration vs. outsourcing depending on the headquarter intensity of their production processes: Final good producers with high η integrate their suppliers into firm boundaries, whereas those with low η cooperate with the latter at

arm's-length (cf. Lemma 1). In any given foreign location ℓ, headquarters prefer relational integration over spot contracting whenever the former yields a higher present value of the profit flow, $\frac{(1+d_N)}{d_N}\pi^r_{HI\ell} \geq \max\left\{\frac{(1+d_N)}{d_N}\pi^s_{HO\ell}, \frac{(1+d_N)}{d_N}\pi^s_{HI\ell}\right\}$, and it is self-enforcing. Formally, a final good producer decides in favor of relational contracting if and only if

$$\pi^r_{HI\ell} \geq \max\left\{\pi^s_{HO\ell}, \pi^s_{HI\ell}\right\}, \quad \text{s.t.} \quad ICC_M \text{ and } ICC_H.$$

As shown in Lemma 2, a headquarter's profit under relational integration, $\pi^r_{HI\ell}$ is increasing in the supplier's level of long-term orientation. Furthermore, ICC_M and ICC_H are more likely to hold the more long-term oriented a supplier and a final good producer, respectively (cf. Lemma 3). Yet, a higher level of both parties' long-term orientation levels not only increases the relative attractiveness of relational governance, but also has an effect on the relative prevalence of vertical integration. Given that integration is a strictly dominant form under relational contracting, while a fraction of final good producers engaged in spot contracting opt out for outsourcing (if η is sufficiently low), we have the following

Proposition. The likelihood of an integration of a foreign supplier into firm boundaries is (weakly) increasing in a supplier's and a headquarter's level of long-term orientation.

Proof. Follows immediately from Lemmas 1 through 3 and the discussion above.

The effect of time-preference rate on the relative prevalence of integration is weak (rather than strict) since some final good producers that were previously engaged in spot integration may now choose relational contracting without changing the (integrated) ownership structure. Yet, some headquarters that were sourcing intermediate inputs from an independent supplier under a spot contract may switch to relational contracting due to a higher level of long-term orientation and, hereby, integrate a supplier into firm boundaries.

4 Empirical Implementation

4.1 Data

To test the key theoretical prediction of this paper, I combine several datasets. Following the bulk of the recent empirical literature on multinational firm boundaries, I use industry-level information on U.S. intra-firm trade from the U.S. Census Bureau's Related Party Trade Database to capture the propensity of firms to source goods within firm boundaries.[11] More specifically, the left-hand side variable is defined as the share of related party imports in

[11] The suitability of this information to measure the international make-or-buy decisions is extensively discussed in Antràs (2015), from where this data is also drawn.

total (i.e., related and non-related) U.S. imports.[12] A higher share of imports sourced from a related party (henceforth, intra-firm import share, $IFIS$) reflects a greater willingness of U.S. firms to obtain an ownership or control stake in foreign suppliers and, thus, captures the relative attractiveness of integration vs. outsourcing. Following Antràs (2015), I consider the period 2000-2011 and restrict the analysis to 390 manufacturing industries, defined at six-digit North American Industry Classification System (NAICS) level.[13]

The key explanatory variable is the index of a country's long-term orientation (LTO) from Hofstede et al. (2010).[14] This measure is one of the five key dimensions developed by Dutch sociologist Geert Hofstede to characterize fundamental cross-cultural differences.[15] Hofstede et al. (2010: 239) define long-term orientation as the cultural value that "stands for the fostering of virtues oriented toward future rewards, in particular, perseverance and thrift" and show that this measure is positively correlated with the importance ascribed to receiving profits in the future rather than obtaining short-term benefits. In this respect, it is well-suited as a proxy for a time preference rate. The LTO measure varies between 0 (short-term orientation) and 100 (long-term orientation). For easier comparability of results, it has been rescaled to the unit interval, see Table 5 in Appendix B.

To better understand if the relationship between long-term orientation and make-or-buy decision is causal, I apply the instrumental variables approach. Using data from Gorodnichenko and Roland (2011), I construct two instruments for the LTO: Euclidian ($EDist$) and Mahalanobis ($Mdist$) distance between the frequency of blood types in a given country and the frequency of blood types in Japan, cf. Table 5 in Appendix B.[16] The choice of Japan as a benchmark country is motived by the fact that this country has a second-highest LTO-score.[17] Moreover, Japanese firms are widely known for their tendency to engage in relational contracting (cf., e.g., the case of Toyota discussed in the introduction). As shown in figures 1 and 2, countries that are more genetically distant from Japan tend to have a

[12] Census Bureau defines 'related parties' as firms "with various types of relationships including any person directly or indirectly, owning, controlling or holding power to vote, 6 percent of the outstanding voting stock or shares of any organization".

[13] See Data Appendix in Antràs (2015) for further discussion of the data.

[14] This score is publicly available at: http://www.geerthofstede.eu

[15] The other four cultural dimensions are individualism vs. collectivism, masculinity vs. femininity, uncertainty avoidance, and power distance.

[16] The Euclidian genetic distance of country ℓ from Japan (JPN) is defined as $EDist(\ell, JPN) = [(f_{A,JPN} - f_{A,\ell})^2 + (f_{B,JPN} - f_{B,\ell})^2]$, where $f_{t,\ell}$ denotes the frequency of blood type $t \in \{A, B\}$ in country ℓ. The Mahalanobis distance takes into account the covariance between blood type frequencies. In general, a Mahalanobis distance distance between a vector x and y picked from distributions X is defined as $MDist(x, y) = [(x - y)' \sum_X^{-1} (x - y)]^{1/2}$, where $\sum_X$ is the covariance matrix for X. In the current context, $\sum_X = \text{var}(f_{A,\ell}, f_{B,\ell})$.

[17] The country with the highest LTO-index is South Korea. However, the goodness of fit in the regression of LTO on Euclidian ($R^2 = 0.122$) and Mahalanobis ($R^2 = 0.166$) blood distance to South Korea is about half of the one in the case of Japan (cf. figures 1 and 2). Hence, to avoid biases associated with weak instruments, I use Japan as the benchmark country.

lower level of long-term orientation. To be clear, these figures do *not* postulate a causal relationship between genes and cultural attributes such as long-term orientation. Instead, if parents transmit not only genes, but also their cultural values to their offspring, populations that are genetically close will happen to be also culturally close.[18] At the same time, genetic instruments are likely to satisfy the exclusion restriction. Given that blood types are 'neutral' genetic markers (i.e. have no impact on individuals' physical and cognitive abilities), they do not have a direct effect on a country's economic outcomes. Furthermore, it is very unlikely that firms make their international make-or-buy decisions based on the genetic distance to the hosts countries.

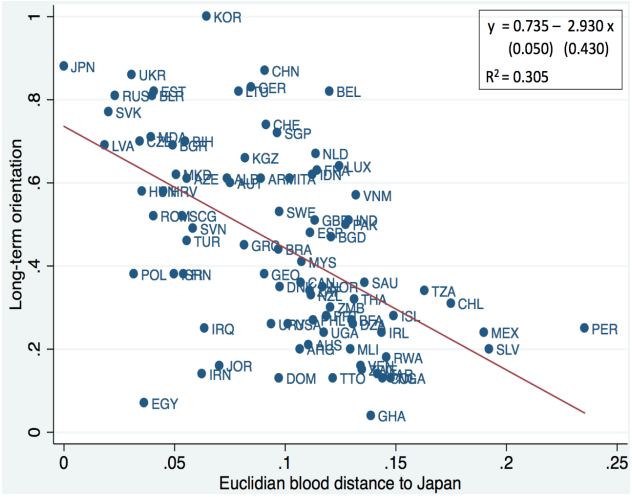

Figure 1: *LTO and Euclidian genetic distance.*

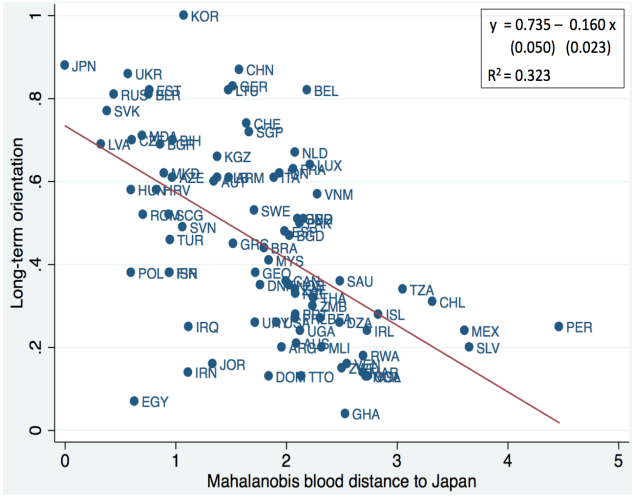

Figure 2: *LTO and Mahalanobis genetic distance.*

Finally, to test the impact of a final good producer's time preference rate on the relative prevalence of integration, I construct a measure of long-term orientation that varies across U.S. sectors. More specifically, I use information on the ancestry of U.S. citizens from the 2000 U.S. Census to estimate the ethnic composition of U.S. industries. In this census, 80.1 percent of the population reported their ethnic origin, 58 percent of which specified a single ancestry, and 22 percent provided two ancestries. For the construction of the measure, I use the first ancestry indicated by an individual.[19] Since the theoretical model presented above emphasizes the effect of cultural distance on the *managerial* make-or-buy decisions, my baseline measures for cultural composition of a sector include only those individuals who indicated their occupation as 'Manager' or 'C.E.O'.[20] Having calculated the ethnic shares of managers in a given industry, I weigh them with the long-term orientation scores of their

[18] This correlation is well aligned with the recent literature, which argues that culture is transmitted mostly inside the family, see, e.g., Bisin and Verdier (2010) for an overview.

[19] The results are robust to construction of an index that incorporates a person's first and second ancestry.

[20] Robustness checks show that the results continue to hold if one considers the workforce as a whole.

ancestor's country of origin to obtain industry-specific measures of long-term orientation:

$$lto_j = \sum_{\ell} S_{\ell j} LTO_{\ell}, \tag{20}$$

where $S_{\ell j}$ is the share of ethnic group ℓ in industry j and LTO_{ℓ} is the long-term orientation of this ethnic group. Once again, the intuition behind this approach builds on recent empirical evidence that cultural traits are (partly) inherited from the ancestors (cf. Algan and Cahuc 2010, 2014). I consider two versions of this measure. The first one, lto_{1j}, includes only those managers who report their ancestry. For the second measure, lto_{2j}, I assign the average U.S. score to all managers in the U.S. census who do not report their ancestry. Table 6 in Appendix B presents the ten industries with the lowest and highest level of long-term orientation. To be clear, this approach merely exploits the distribution of long-term oriented managers across industries and does *not* posit inherent differences in long-term orientation between them. In view of this paper's theoretical proposition, one would expect a higher fraction of intra-firm imports in industries with higher lto_j scores.

4.2 Econometric Specification

This paper's baseline specification reads:

$$\begin{aligned} IFIS_{j\ell t} =& a \times LTO_{\ell} + b_1 \times \log\left(R\&DInt\right)_{j\ell} + b_2 \times \log\left(CapInt\right)_{j\ell} + b_3 \times \log\left(SkillInt\right)_{j\ell} \\ &+ b_4 \times Freight_{j\ell} + b_5 \times Tarif_{j\ell} + b_6 \times Dispersion_{j\ell} + b_7 \times Elasticity_{j\ell} + \boldsymbol{b} \times \mathbf{X}_{\ell} + \varepsilon, \end{aligned}$$

where $IFIS$ is the U.S. intra-firm import share from the U.S. Bureau of Customs and Border Protection and j, ℓ, and t index sectors, countries, and years, respectively. The key explanatory variable is the level of a foreign country's long-term orientation, LTO_{ℓ}.

Control variables 1 through 7 are standard in the empirical literature studying the international make-or-buy decision and are drawn from Antràs (2015). Since the suitability of these variables has been discussed at length in Antràs (2015), the introduction of control variables in the current paper is deliberately brief. In order to test for the key prediction of the Property Right Theory (cf. Lemma 1), headquarter intensity (η) is proxied by the R&D-, capital-, and skill-intensity. More specifically, $Log(R\&DInt)$ denotes the log of Research and Development expenditures as a share of total sales, *Log(CapInt)* is the log of the real capital stock per worker, and *Log(SkillInt)* is defined as the log of the number of non-production workers divided by total employment. Using a Property Rights model featuring firm-level heterogeneity and a tradeoff between domestic and foreign sourcing, Antràs (2015) finds a

positive effect of trade cost and productivity dispersion and an ambiguous effect of demand elasticity on the share of intra-firm trade. To account for these predictions, I follow Antràs (2015) in including controls for *FreightCost* (the ratio of CIF imports to FOB imports) and U.S. *Tariffs*, a measure for the *Dispersion* of firm productivities (constructed as the standard deviation of log exports across U.S. port locations and destination countries), and a proxy for the *Elasticity* of demand.

One might argue that a country's level of long-term orientation merely reflects the stability of its institutions. In order to rule out the effect of legal institutions on the prevalence of integration, I include a wide range of institutional controls. In this paper, I report only the effect of government stability (*GovStability*) and provide the robustness checks including alternative institutional measures upon request. This proxy stems from the International Country Risk Guide (ICRG) and measures both the government's ability to carry out its declared program(s), and its ability to stay in office, averaged over 1980 through 2000. Finally, cultural attributes of a society might also be a function of its size or economic development. To rule out this alternative explanation, I include the log of a country's GDP in 2000, *Log(GDP)*, from Penn World Table as an additional regressor.

4.3 Empirical Analysis

As a first pass at the data, I regress the share of U.S. intra-firm imports ($IFIS$) against the level of a country's long-term orientation, *LTO*. As shown in specification (1) of table 1, the correlation between these two measures is positive and highly significant. A long-term oriented country such as Japan has over 50% of imports that are intra-firm, whereas for a rather short-term oriented country like Portugal this fraction is less than 25%. While this correlation is informative, one obviously needs to control for other variables to see if this relation is not driven by omitted factors. Columns (2)-(5) in table 1 report the results of the baseline OLS regressions. As one adds more controls, the coefficient on *LTO* decreases but remains significant throughout the specifications. Estimates for the control variables in columns (2) and (4) are broadly in line with previous empirical studies of global sourcing, cf. Chapter 8 in Antràs (2015). In particular, *Log*($R\&DInt$) and *Log(CapitalInt)* both have the predicted sign and are significant, while *Log(SkillInt)* has the right sign but is not significant in all specifications. This evidence suggests that a country's *LTO* may have an independent impact on firms' make-or-buy decisions alongside the well-established channel of the Property Rights Theory of the firm.

Clearly, the results from the simple OLS regression presented above are not sufficient to claim a causal impact of *LTO* on intra-firm imports. For instance, given that the presence of

multinational firms itself may affect a country's time preferences, the previously mentioned econometric model is prone to reverse causality. In order to deal with the issue of endogeneity at stake, I apply the instrumental variables approach. A country's *LTO* has been instrumented by Euclidian blood distance (*EDist*) in column (6) and Mahalanobis blood distance (*MDist*) in column (7). In both cases, a country's *LTO* has a positive and significant effect on *IFIS*. Notably, the magnitude of IV coefficients on *LTO* are larger compared to the corresponding OLS coefficients. In view of the strong first stage fit and a high F-value ($F = 106.33$ and $F = 102.13$ if *LTO* is instrumented by $EDist$ and $MDist$, respectively), this difference cannot be attributed to weak instruments but rather suggests the presence of measurement errors in the OLS regression.

Table 1: *Determinants of U.S. Intra-firm Import Shares.*

	Dependent variable: $IFIS$						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
LTO	0.079***	0.078***	0.076***	0.076***	0.028***	0.064***	0.041***
	(0.006)	(0.006)	(0.006)	(0.006)	(0.007)	(0.016)	(0.015)
Log(R&DInt)		0.035***	0.025***	0.025***	0.025***	0.025***	0.025***
		(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Log(CapInt)		0.016***	0.021***	0.022***	0.022***	0.022***	0.022***
		(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
Log(SkillInt)		0.028*	0.000	0.004	0.005	0.005	0.005
		(0.016)	(0.015)	(0.016)	(0.016)	(0.016)	(0.016)
FreightCost			-0.786***	-0.799***	-0.801***	-0.799***	-0.801***
			(0.112)	(0.113)	(0.113)	(0.112)	(0.113)
Tariffs			-0.001**	-0.001**	-0.001***	-0.001***	-0.001***
			(0.001)	(0.001)	(0.000)	(0.000)	(0.000)
Dispersion				-0.006	-0.005	-0.005	-0.005
				(0.010)	(0.010)	(0.010)	(0.010)
Elasticity				-0.001**	-0.001**	-0.001**	-0.001**
				(0.000)	(0.000)	(0.000)	(0.000)
Log(GDP)					0.021***	0.019***	0.020***
					(0.001)	(0.002)	(0.002)
GovStability					0.027***	0.024***	0.026***
					(0.002)	(0.002)	(0.002)
Observations	239,055	239,055	239,055	239,055	226,842	226,842	226,842
R-squared	0.003	0.034	0.045	0.046	0.057	0.057	0.057

Note: The table reports estimates of OLS regressions in columns (1)-(5) and IV regressions in columns (6)-(7). Robust standard errors are clustered at the industry level and presented in brackets. ***, **, * denote 1, 5, 10 % significance.

The evidence presented above corroborates this paper's theoretical prediction regarding the impact of a *foreign* country's long-term orientation on the international make-or-buy decision. In order to study the effect of *home* managers' long-term orientation, I run regressions along the lines of the baseline specification but substitute *LTO* with lto_1 and lto_2. Columns (1) and (2) in table 2 show that both measures are indeed positively and significantly correlated with the intra-firm import shares.[21] Notably, the coefficient on lto_2 (which assigns the average U.S. *LTO*-score to all respondents who didn't report their ancestry) is smaller in

[21] The number of observations is different in table 2 relative to table 1 since industry classification in U.S. Census is coarser then in the database of the U.S. Bureau of Customs and Border Protection.

magnitude relative to the lto_1. This is not surprising given that the U.S. LTO-score belongs to the lowest quartile in the long-term orientation rank. The magnitude of both coefficients remains roughly similar when controlling for year fixed effects in specifications (3) and (4). The effect of lto_1 and lto_2 continues to be be highly significant after controlling for both year *and* country fixed effects, although the size of the estimates is slightly reduced, cf. columns (5) and (6).

Table 2: *Determinants of U.S. Intra-firm Import Shares.*

	Dependent variable: $IFIS$					
	(1)	(2)	(3)	(4)	(5)	(6)
lto_1	1.442***		1.441***		1.182***	
	(0.410)		(0.410)		(0.404)	
lto_2		1.275***		1.273***		1.142***
		(0.452)		(0.452)		(0.471)
Log(R&DInt)	0.041***	0.041***	0.041***	0.041***	0.043***	0.043***
	(0.012)	(0.013)	(0.012)	(0.013)	(0.012)	(0.012)
Log(CapInt)	0.020	0.026**	0.020	0.026**	0.018	0.022*
	(0.013)	(0.012)	(0.013)	(0.012)	(0.013)	(0.013)
Log(SkillInt)	-0.023	-0.053	-0.022	-0.053	-0.010	-0.039
	(0.032)	(0.040)	(0.032)	(0.040)	(0.035)	(0.042)
FreightCost	-0.274	-0.153	-0.273	-0.152	-0.377	-0.259
	(0.382)	(0.450)	(0.381)	(0.449)	(0.385)	(0.440)
Tariffs	-0.002***	-0.002***	-0.002***	-0.002***	-0.002***	-0.001***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Dispersion	0.024	0.024	0.024	0.024	0.021	0.022
	(0.034)	(0.035)	(0.034)	(0.035)	(0.035)	(0.036)
Elasticity	-0.003**	-0.002**	-0.003**	-0.002**	-0.003**	-0.003**
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Log(GDP)	0.025***	0.025***	0.025***	0.025***		
	(0.003)	(0.003)	(0.003)	(0.003)		
GovStability	0.034***	0.035***	0.034***	0.034***		
	(0.005)	(0.005)	(0.005)	(0.005)		
Fixed Effects	None	None	Year	Year	Ctr/Year	Ctr/Year
Observations	34,935	34,935	34,935	34,935	34,935	34,935
R-squared	0.093	0.087	0.098	0.093	0.283	0.280

Note: Robust standard errors are clustered at the industry level and presented in brackets. ***, **, * denote 1, 5, 10 % significance.

4.4 Alternative proxies

As a robustness check, I rerun the above-mentioned regressions using different proxies for the prevalence of relational contracting and alternative instruments. The choice of these measures is motived by the theoretical literature on repeated games, which commonly interprets a party's time preference rate as an inverse measure of this party's trustworthiness (see, e.g., Kvaloy and Olson 2009 and MacLeod 2007). In particular, trustworthy managers are more likely to abide by their long-term implicit commitments rather than seizing one-shot profit opportunities and deviating from a relational agreement. In view of this paper's key theoretical prediction, one would expect a higher prevalence of integration whenever the

trust level of foreign suppliers and domestic headquarters is high.

This paper's measure of trust is constructed using the integrated dataset of the European Values Survey (EVS) and the World Values Survey (WVS), from 1980-2008. I choose the 2005-2007 WVS wave as a benchmark wave due to the largest number of surveyed countries.[22] Missing data for several European and non-European countries is gathered from the 2008 EVS wave and former WVS waves.[23] Individual perceptions of trust in WVS and EVS are measured by the generalized trust question: "Generally speaking, would you say that most people can be trusted or that you can't be too careful in dealing with people?" To answer this question, respondents were asked to choose one of the following two options: "Most people can be trusted", or "Can't be too careful". The fraction of individuals in a given country choosing the first response will be used as a country's level of *Trust*, cf. table 7 in Appendix B.[24]

In order to identify a causal effect of *Trust* on the make-or-buy decision, this paper builds on the approach suggested by Algan and Cahuc (2010). To construct an instrument for the level of *Trust*, I use data from the General Social Survey (GSS), which, in contrast to EVS/WVS, measures social attitudes exclusively of the U.S. residents. I further restrict the relevant sample to those respondents who were born in the US, but whose parents and/or grandparents immigrated to this country. More specifically, respondents to GSS indicate since 1977 their birthplace and the number of parents and/or grandparents that were born in the US. Following Algan and Cahuc (2010), I define a US immigrant as a person who was born in the US and who has at least one abroad-born ancestor (parent and/or grandparent).[25] The variable for the respondent's ancestral country of origin reads as follows: "From what countries or part of the world did your ancestors come?" Up to the year 1984, the dataset contains information on a single country of origin. Thereafter, respondents were allowed to report up to three countries of origin and to indicate which of these countries they felt closest to.[26] In order to make the comparison across years feasible, I consider the country which a respondent felt mostly associated with as the ancestral country of origin. Among those countries which are represented in the EVS/WVS dataset, the GSS contains a subset of 28 countries of origin (cf. table 8 in Appendix). Individual perceptions of trust in GSS are measured by the same 'trust question' as in EVS/WVS. As an answer to this question,

[22] The results are similar by considering previous waves or taking averages across waves in a given country.

[23] Table 7 in Appendix B reports the country list and the respective survey wave.

[24] This measure of 'generalized trust' has been extensively used in the literature to study the effect of social capital on various economic outcomes, see Guiso et al. (2010) for an overview. The effect of trust on the make-or-buy decision, however, has not been unexplored in this literature.

[25] All results remain robust to imposing a narrower definition of an immigrant (e.g., having at least one parent *and* grandparent that were born abroad).

[26] Nevertheless, the great majority of respondents still reported a single country of origin.

respondents were able to choose one of the following three options: "Most people can be trusted", "Can't be too careful", and "Depends". I construct a trust indicator which is equal to 1 if the respondent selected the first option and 0 if the respondent indicated one of the latter two options.[27] As before, I calculate for each country the mean fraction of individuals choosing the first option and borrow from Algan and Cahuc (2010) the label *Inherited Trust* for this measure. As shown in figure 3, the two measures of trust are positively correlated. Once again, this correlation suggests that cultural values and social norms are transmitted mostly inside the family. Yet, since the trust level of an immigrant's descendants is not affected by the current economic or institutional development in the ancestor's country of origin, it is likely to satisfy the exclusion restriction.

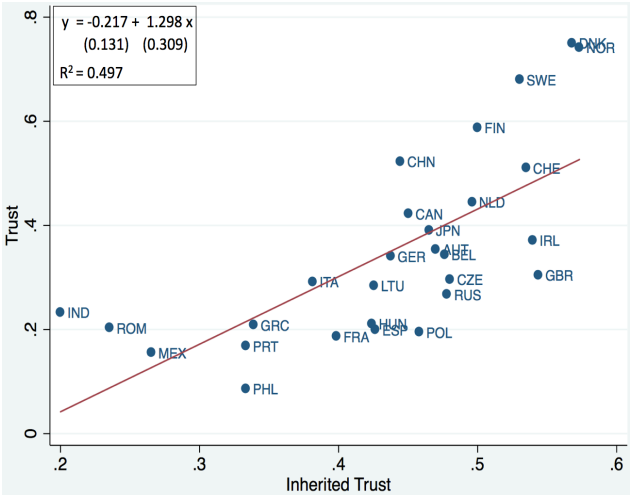

Figure 3: *Trust and Inherited Trust.*

Lastly, to test the impact of final good producers' trustworthiness on the relative prevalence of integration, I construct the measure of trust that varies across U.S. sectors. The construction of this measure is by analogy to (22):

$$trust_j = \sum_{\ell} S_{\ell j} Trust_{\ell}, \tag{22}$$

whereby $S_{\ell j}$ is the share of ethnic group ℓ in industry j and $Trust_{\ell}$ is the level of trust of this ethnic group. As before, I consider two versions of this measure: $trust_{1j}$, which includes only those managers who report their ancestry, and $trust_{2j}$, which assigns the average U.S. score to all respondents of the U.S. census who do not report their ancestry.

The first column of table 3 reports a positive correlation between a foreign country's level of trust and the share of intra-firm imports. After including the above-mentioned control variables in columns (2)-(5), the coefficient on *Trust* decreases but remains sig-

[27] I run robustness checks by putting together the first and third option or dropping the answer „Depends". The results are qualitatively unchanged.

nificant throughout the specifications. As before, positive and significant coefficients on *Log*(*R&DInt*) and *Log(CapitalInt)* suggest that headquarter intensity continues to play an important role for firms' make-or-buy decisions alongside the novel channel emphasized in the current paper. In order to come closer towards a causal inference of the novel prediction, *Trust* is instrumented by *Inhereted Trust* in specification (6). The positive coefficient on *Trust* continues to be highly significant.

Table 3: *Determinants of U.S. Intra-firm Import Shares.*

	Dependent variable: $IFIS$					
	(1)	(2)	(3)	(4)	(5)	(6)
Trust	0.207***	0.203***	0.202***	0.202***	0.167***	0.262***
	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.026)
Log(*R&DInt*)		0.035***	0.024***	0.025***	0.024***	0.029***
		(0.004)	(0.004)	(0.004)	(0.004)	(0.005)
Log(CapInt)		0.016***	0.021***	0.022***	0.022***	0.020***
		(0.005)	(0.005)	(0.005)	(0.005)	(0.006)
Log(SkillInt)		0.027*	-0.000	0.003	0.004	0.010
		(0.016)	(0.015)	(0.015)	(0.016)	(0.018)
FreightCost			-0.779***	-0.792***	-0.796***	-0.834***
			(0.111)	(0.112)	(0.111)	(0.132)
Tariffs			-0.001**	-0.001**	-0.001***	-0.001***
			(0.001)	(0.001)	(0.000)	(0.000)
Dispersion				-0.006	-0.005	0.002
				(0.010)	(0.010)	(0.012)
Elasticity				-0.001**	-0.001**	-0.001***
				(0.000)	(0.000)	(0.000)
Log(GDP)					0.021***	0.009***
					(0.001)	(0.002)
GovStability					0.019***	-0.007*
					(0.002)	(0.004)
Observations	246,643	246,643	246,643	246,643	230,233	111,525
R-squared	0.011	0.042	0.052	0.053	0.065	0.052

Note: The table reports estimates of OLS regressions in columns (1)-(5) and of an IV regression in column (6). Robust standard errors are clustered at the industry level and presented in brackets. ***, **, * denote 1, 5, 10 % significance.

To test the effect of final good producers' trust levels on the international make-or-buy decision, I regress the share of intra-firm imports against $trust_1$ and $trust_2$, cf. table 4. Notice from specifications (1) and (2) that coefficient on $trust_2$ (which assigns the average U.S. $Trust$-score to all managers who didn't report their ancestry) is higher in magnitude than the one on $trust_1$. This result can be easily rationalized by the fact that the U.S. $Trust$-index belongs to the highest quartile in the rank of trust scores. Yet, while the coefficient on $trust_1$ is significant at the 5% level, the coefficient on $trust_2$ is significant only at the 10% level. This finding is not surprising given that, by assigning the U.S. $Trust$-score to all respondents of the U.S. Census, it takes out some of the variation on the industry level. A similar pattern emerges after controlling for year fixed effects, cf. specifications (3) and (4). Once one includes year *and* country fixed effects (see specifications (5) and (6)), both coefficients lose their significance. A possible explanation behind this result is that

the measure of generalized trust is a very broad concept and it not necessarily tantamount to the notion of time preference rate used in the theoretical model. Nevertheless, the fact that coefficients $trust_1$ and $trust_2$ are positive throughout the specifications is generally in support of this paper's theoretical prediction.

Table 4: *Determinants of U.S. Intra-firm Import Shares.*

	Dependent variable: $IFIS$					
	(1)	(2)	(3)	(4)	(5)	(6)
$trust_1$	1.167**		1.166**		0.635	
	(0.483)		(0.482)		(0.560)	
$trust_2$		1.412*		1.413*		0.557
		(0.838)		(0.837)		(0.912)
Log(R&DInt)	0.040***	0.039***	0.040***	0.039***	0.042***	0.042***
	(0.013)	(0.013)	(0.013)	(0.013)	(0.012)	(0.012)
Log(CapInt)	0.029**	0.030**	0.029**	0.030**	0.026**	0.027**
	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)
Log(SkillInt)	-0.019	-0.005	-0.019	-0.005	-0.004	0.003
	(0.035)	(0.036)	(0.035)	(0.036)	(0.036)	(0.037)
FreightCost	-0.384	-0.430	-0.383	-0.428	-0.473	-0.495
	(0.428)	(0.429)	(0.428)	(0.428)	(0.422)	(0.421)
Tariffs	-0.002***	-0.002***	-0.002***	-0.002***	-0.002***	-0.002***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Dispersion	0.005	0.000	0.005	0.000	0.004	0.002
	(0.034)	(0.034)	(0.034)	(0.034)	(0.035)	(0.035)
Elasticity	-0.003**	-0.003**	-0.003**	-0.003**	-0.003**	-0.003**
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Log(GDP)	0.025***	0.025***	0.025***	0.025***		
	(0.003)	(0.003)	(0.003)	(0.003)		
GovStability	0.036***	0.036***	0.036***	0.036***		
	(0.005)	(0.005)	(0.005)	(0.005)		
Fixed Effects	None	None	Year	Year	Ctr/Year	Ctr/Year
Observations	35,299	35,299	35,299	35,299	35,299	35,299
R-squared	0.083	0.083	0.089	0.088	0.275	0.274

Note: Robust standard errors are clustered at the industry level and presented in brackets. ***, **, * denote 1, 5, 10 % significance.

5 Concluding Comments

This paper presents a repeated game model of global sourcing in which final good producers decide whether to engage in relational contracting and whether to integrate their suppliers into firm boundaries or deal with the latter at arm's length. The key prediction of this model is that the likelihood of vertical integration is increasing in cooperation parties' long-term orientation. Combining data on U.S. intra-firm imports with various proxies for long-term orientation, I find strong support for this theoretical prediction, controlling for a wide range of additional variables and accounting for the issue of endogeneity. Although one cannot rule out that agents' time-preference rates affect the integration decision via channels other than the ones suggested in the current model, this paper's empirical results shed new light

on the role of culture in the international organization of production.

This paper leaves several questions open for future investigation. First, this model's key theoretical prediction is derived in a partial equilibrium set-up. While I believe that this key result will continue to hold after extending this framework to a general equilibrium model, such an approach may provide further insights into the effect of culture on the international make-or-buy decision and the patterns of international trade. Second, due to current unavailability of firm-level datasets featuring detailed information on international integration decisions, the empirical analysis in this paper was conducted on the industry level. Once extensive firm-level data on international make-or-buy decisions becomes available, this paper's theoretical prediction should be empirically reassessed.

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A Mathematical Appendix

A.1 Proof of Lemma 1

Consider first the slope of $\Theta_H^s(\eta)$. Simple differentiation of (8) with respect to η yields

$$\frac{\partial \Theta_H^s(\eta)}{\partial \eta} = \frac{\alpha}{1-\alpha}\Theta_H^s\left([\ln \beta_I - \ln \beta_O] + [\ln(1-\beta_O) - \ln(1-\beta_I)]\right) > 0,$$

whereby the positive sign of the derivative results from the fact that expressions in squared brackets are greater than zero for all $\beta_I > \beta_O$.

Consider next the corner solutions of $\Theta_H^s(\eta)$. If $\eta = 1$, spot integration strictly dominates spot outsourcing, since $\Theta_H^s|_{\eta=1} = (\beta_I/\beta_O)^{\frac{1}{1-\alpha}} > 1$ when $\beta_I > \beta_O$. If $\eta = 0$, the sign of

$$\Theta_H^s|_{\eta=0} = \frac{\beta_I}{\beta_O}\left(\frac{1-\beta_I}{1-\beta_O}\right)^{\frac{\alpha}{1-\alpha}}$$

is ambiguous. The sign of the first order derivative of this expression with respect to $\beta_{h\ell I}$

$$\frac{\partial \Theta_{H\ell}^s|_{\eta=0}}{\partial \beta_I} = \frac{[1-\beta_I-\alpha]}{\beta_O(1-\beta_I)(1-\alpha)}\left(\frac{1-\beta_I}{1-\beta_O}\right)^{\frac{\alpha}{1-\alpha}}$$

depends on the sign of the term in the squared brackets. If $1-\beta_I < \alpha$, this term is negative and $\Theta_H^s|_{\eta=0}$ is decreasing in β_I. That is, if $\Theta_H^s(0) \leq 1$ for the lowest possible $\beta_I = \underline{\beta}_I$, it holds $\Theta_H^s|_{\eta=0} < 1$ a fortiori for all $\beta_I > \underline{\beta}_I$. Recall that $\underline{\beta}_I = \beta_O$. It can be immediately seen that $\Theta_H^s|_{\eta=0} = 1$ for $\beta_I = \beta_O$. Hence, $\Theta_H^s|_{\eta=0} < 1$ for all $\beta_I > \beta_O$. In contrast, if $1-\beta_I > \alpha$, we have $\partial \Theta_{H\ell}^s|_{\eta=0}/\partial \beta_I > 0$ and spot outsourcing is never chosen as the organizational form (since $\Theta_H^s|_{\eta=0} > 1$ and $\Theta_H^s(\eta)$ is increasing in η). In order to allow for both organizational forms in equilibrium, I impose Assumption 1 in the main text.

A.2 Proof of Lemma 2

Denote the right-hand side of (16) by RHS. Differentiating RHS with respect to η yields

$$\frac{\partial RHS}{\partial \eta} = \frac{\alpha(1-\beta_k)^{\frac{1}{1-\alpha(1-\eta)}}(1-\alpha(1-\eta)-\ln(1-\beta_k))}{1-\alpha(1-\eta)} > 0,$$

whereby the sign of this derivative follows from the fact that $(1-\alpha(1-\eta)) > 0$ and $\ln(1-\beta_k) < 0$ for all $\alpha, \eta, \beta_k < 0$. A simple differentiation of RHS with respect to d_ℓ yields

$$\frac{\partial RHS}{\partial d_\ell} = \frac{(1-\beta_k)^{\frac{1}{1-\alpha(1-\eta)}}(1-\alpha(1-\eta))}{(1+d_\ell)^2} > 0,$$

whereas the first-order derivative of RHS with respect to β_k immediately implies

$$\frac{\partial RHS}{\partial \beta_k} = -(1-\beta_k)^{\frac{\alpha(1-\eta)}{1-\alpha(1-\eta)}} < 0.$$

A.3 Ex-ante Transfers

This section explores the robustness of the paper's key results to an alternative contracting assumption. Following Antràs and Helpman (2004, 2008), I assume that the ex-ante contract includes an upfront participation fee $T_{k\ell}$, that has to be paid by a supplier. Assuming an infinitely elastic supply of M, M's profits from spot contracting net of ex-ante transfer is equal to a supplier's outside option, ω_m. In equilibrium, we thus have $\pi^s_{Mk\ell} - T_{k\ell} = \omega_m$. It is well-known from Antràs and Helpman (2004, 2008) that the presence of ex-ante transfers has no effect on both parties' investment levels and the resulting profits from ex-post bargaining. We thus can use the results from (7) to derive the equilibrium transfer:

$$T_{k\ell} = (1-\beta_k)\left(\beta_k^{\eta}(1-\beta_k)^{(1-\eta)}\right)^{\frac{\alpha}{1-\alpha}}(w_\ell\tau_\ell)^{-\frac{\alpha(1-\eta)}{1-\alpha}}A(1-\alpha(1-\eta)) - \omega_m. \tag{23}$$

If the transfers were allowed, the entire surplus from the relationship accrues to H. Combining $\pi^s_{Hk\ell}$ from (7) with the above transfer, we obtain the overall profit under spot contracting:

$$\pi_{k\ell}(\eta) = \left(\beta_k^{\eta}(1-\beta_k)^{(1-\eta)}\right)^{\frac{\alpha}{1-\alpha}}(1-\alpha[\beta_k\eta+(1-\beta_k)(1-\eta)])(w_\ell\tau_\ell)^{-\frac{\alpha(1-\eta)}{1-\alpha}}A - \omega_m. \tag{24}$$

As in the case without transfers, the choice of organizational form crucially depends on the headquarter intensity η. A headquarter decides to cooperate with a supplier under spot integration rather than spot outsourcing whenever

$$\Theta^s(\eta) \equiv \frac{\Pi_{I\ell}}{\Pi_{O\ell}} = \frac{\left(\beta_I^{\eta}(1-\beta_I)^{(1-\eta)}\right)^{\frac{\alpha}{1-\alpha}}(1-\alpha[\beta_I\eta+(1-\beta_I)(1-\eta)])}{(\beta_O^{\eta}(1-\beta_O)^{(1-\eta)})^{\frac{\alpha}{1-\alpha}}(1-\alpha[\beta_O\eta+(1-\beta_O)(1-\eta)])}$$

is larger than one. Following the approach discussed in Appendix A.1, one can derive the result analogous to Lemma 1: There exists a unique headquarter intensity $\hat{\eta} \in (0,1)$, such that headquarter profit is higher under spot outsourcing (integration) for $\eta < \hat{\eta}$ (respectively, $\eta > \hat{\eta}$). Unlike Lemma 1, however, this result does not require Assumption 1.

Consider now the case of relational contracting. In the presence of ex-ante transfers, investments on the equilibrium path are still described by (9). The competitive fringe of suppliers in the presence of ex-ante transfers, implies, however, that a supplier's profits net of up-front payment and of ex-post bonus are driven down to M's outside option, i.e. $\pi^r_{Mk\ell} - T_{k\ell} = \omega_m$, whereby $\pi^r_{Mk\ell}$ and $T_{k\ell}$ are given by (10) and (23), respectively. On the off-

the equilibrium path, investments are still given by (11) and a supplier's one-shot deviation profits net of the ex-ante transfer reads:

$$\pi^D_{Mk\ell} - T_{k\ell} = (w_\ell \tau_\ell)^{-\frac{\alpha(1-\eta)}{1-\alpha}} A(1-\alpha(1-\eta))(1-\beta_k)\left[(1-\beta_k)^{\frac{\alpha(1-\eta)}{1-\alpha(1-\eta)}} - \beta_k^{\frac{\alpha\eta}{1-\alpha}}(1-\beta_k)^{\frac{\alpha(1-\eta)}{1-\alpha}}\right]. \quad (25)$$

Notice that M's profit on the deviation path is positive if the expression in the squared brackets is larger than zero. Given that $\beta_k^{\frac{\alpha\eta}{1-\alpha}} < 1$, it is sufficient to show that $(1-\beta_k)^{\frac{\alpha(1-\eta)}{1-\alpha(1-\eta)}} > (1-\beta_k)^{\frac{\alpha(1-\eta)}{1-\alpha}}$ in order to ensure that $\pi^D_{Mk\ell} - T_{k\ell}$ is positive. The latter inequality is in fact fulfilled since $1-\alpha(1-\eta) > 1-\alpha$ for all parameter values. Hence, as in the case without ex-ante transfers, M can reap positive profits by reneging on the relational agreement.

The headquarter is willing to engage in relational contracting only if a supplier's incentive compatibility constraint is fulfilled. In the presence of ex-ante transfers, this ICC_M reads:

$$\frac{(1+d_\ell)\omega_m}{d_\ell} \geq \pi^D_{Mk\ell} - T_{k\ell}, \quad (26)$$

whereby $\pi^D_{Mk\ell} - T_{k\ell}$ is given by (25). As in Lemma 2, the ICC_M is more likely to hold under relational integration rather than relational outsourcing. To prove this, I differentiate the right-hand side of (26) with respect to β_k and obtain after simplification:

$$\frac{\partial(\pi^D_{Mk\ell} - T_{k\ell})}{\partial\beta_k} = -\frac{(w_\ell\tau_\ell)^{-\frac{\alpha(1-\eta)}{1-\alpha}} A}{\beta_k(1-\alpha)}\left[(1-\alpha)\beta(1-\beta_k)^{\frac{\alpha(1-\eta)}{1-\alpha(1-\eta)}} + (1-\alpha(1-\eta))(\alpha\eta-\beta)\beta_k^{\frac{\alpha\eta}{1-\alpha}}(1-\beta_k)^{\frac{\alpha(1-\eta)}{1-\alpha}}\right]$$

This first order derivative is negative if and only if the expression in squared brackets is positive. A tedious but straightforward analysis shows that the latter expression is larger than zero for all parameter values. Hence, headquarters strictly prefer relational integration over relational outsourcing. Furthermore, as in Lemma 2, H is more likely to offer a relational contract to M the higher the latter's level of long-term orientation (i.e., the lower d_ℓ).[28] Finally, if the transfers were allowed, a supplier is willing to accept a relational integration contract offered by a headquarter only if H's incentive compatibility constraint is fulfilled:

$$\frac{1+d_N}{d_N}\left[(w_\ell\tau_\ell)^{-\frac{\alpha(1-\eta)}{1-\alpha}}(1-\alpha)A - \omega_m\right] \geq \pi^D_{HI\ell} + T_{k\ell},$$

whereby $\pi^D_{HI\ell}$ and $T_{k\ell}$ are given by (18) and (23), respectively. As in Lemma 3, a supplier is more likely to engage in relational integration the higher a headquarter's long-term orientation (i.e., the lower d_N). To sum up, the key result of the Benchmark model continues to hold under the assumption of ex-ante transfers.

[28] The effect of headquarter intensity η on the likelihood of relational contracting shown in Lemma 2 holds only under certain parameter restrictions, which can be provided upon request.

B Tables

Table 5: *Level of long-term orientation, Euclidian and Mahalanobis distance to Japan.*

Country	*LTO*	*EDist*	*MDist*	Country	*LTO*	*EDist*	*MDist*
Albania	.61	.113	1.878	Latvia	.69	.018	.324
Algeria	.26	.130	2.479	Lithuania	.82	.078	1.476
Argentina	.2	.106	1.956	Luxembourg	.64	.124	2.213
Armenia	.61	.089	1.478	Macedonia	.62	.050	.895
Australia	.21	1.110	2.987	Malaysia	.41	.107	1.840
Austria	.60	.075	1.356	Mali	.20	.129	2.317
Azerbaijan	.61	.055	.968	Mexico	.24	.189	3.607
Bangladesh	.47	.120	2.028	Moldova	.71	.039	.695
Belarus	.81	.039	.754	Morocco	.14	.141	2.690
Belgium	.82	.120	2.185	Netherlands	.67	.113	2.078
Bosnia	.70	.054	.973	New Zealand	.33	.111	2.082
Brazil	.44	.097	1.797	Nigeria	.13	.147	2.717
Bulgaria	.69	.049	.859	Norway	.35	.116	2.023
Burkina Faso	.27	.130	2.307	Pakistan	.50	.127	2.120
Canada	.36	.107	1.997	Peru	.25	.235	4.463
Chile	.31	.174	3.319	Philippines	.27	.112	2.077
China	.87	.090	1.573	Poland	.38	.031	.595
Colombia	.13	.144	2.731	Portugal	.28	.118	2.082
Croatia	.58	.045	.826	Romania	.52	.040	.705
Czech Republic	.70	.034	.605	Russia	.81	.023	.439
Denmark	.35	.097	1.763	Rwanda	.18	.145	2.694
Dominican Rep.	.13	.097	1.839	Saudi Arabia	.36	.136	2.483
Egypt	.07	.036	.627	Serbia	.52	.053	.935
El Salvador	.20	.192	3.652	Singapore	.72	.096	1.663
Estonia	.82	.040	.762	Slovak Republic	.77	.020	.378
Finland	.38	.054	.945	Slovenia	.49	.058	1.063
France	.63	.114	2.060	South Africa	.34	.111	2.075
Georgia	.38	.090	1.719	Spain	.48	.111	1.984
Germany	.83	.084	1.516	Sweden	.53	.097	1.707
Ghana	.04	.138	2.503	Switzerland	.74	.091	1.640
Greece	.45	.081	1.520	Tanzania	.34	.163	3.049
Hungary	.58	.035	.595	Thailand	.32	.131	2.245
Iceland	.28	.149	2.831	Trinidad & Tobago	.13	.121	2.135
India	.51	.128	2.156	Turkey	.46	.055	.948
Indonesia	.62	.112	1.938	United Kingdom	.51	.113	2.101
Iran	.14	.062	1.110	U.S.A.	.26	.101	1.912
Iraq	.25	.063	1.117	Uganda	.24	.117	2.124
Ireland	.24	.143	2.729	Ukraine	.86	.030	.568
Israel	.38	.049	.940	Uruguay	.26	.093	1.716
Italy	.61	.102	1.886	Venezuela	.16	.134	2.546
Japan	.88	0	0	Vietnam	.57	.132	2.280
Jordan	.16	.070	1.334	Zambia	.30	.120	2.238
Korea South	1	.064	1.073	Zimbabwe	.15	.134	2.499

Table 6: *Ten industries with the highest and lowest prevalence of long-term orientated managers.*

*lto*1	10 industries with highest long-term orientation	*lto*1	10 industries with lowest long-term orientation
.424	Carpet and rug mills	.552	Motor vehicles and motor vehicle equipment
.430	Animal slaughtering and processing	.555	Dairy products
.449	Apparel accessories and other apparel	.556	Other transportation equipment
.464	Fruit and vegetable preserving	.557	Household appliances
.465	Fabric mills, except knitting	.565	Agricultural chemicals
.477	Fiber, yarn, and thread mills	.566	Metalworking machinery
.478	Textile and fabric finishing and coating mills	.568	Engines, turbines, and power transmission
.480	Bakeries, except retail	.576	Animal food, grain and oilseed milling
.482	Textile product mills except carpets and rugs	.577	Construction mining and oil field machinery
.489	Leather tanning and products, except footwear	.596	Agricultural implements

Table 7: *Descriptive statistics for the "Trust question" in the WVS.*

Country	N	"Trust most people"	"Can't be too careful"	*Trust*	Country	N	"Trust most people"	"Can't be too careful"	*Trust*	Country	N	"Trust most people"	'Can't be too careful"	*Trust*
Albania[b]	1452	145	1307	.09	Great Britain[a]	1022	311	711	.30	Norway[a]	1018	755	263	.74
Algeria[c]	1230	138	1092	.11	Greece[b]	1463	305	1158	.20	Pakistan[c]	1826	563	1263	.30
Andorra[a]	994	206	788	.20	Ghana[a]	1527	130	1397	.08	Peru[a]	1480	95	1385	.06
Argentina[a]	983	166	817	.16	Guatemala[a]	995	156	839	.15	Philippines[c]	1185	102	1083	.08
Armenia[b]	1488	302	1186	.20	Hong Kong[a]	1230	505	725	.40	Poland[a]	955	186	769	.19
Australia[a]	1403	676	727	.48	Hungary[b]	1512	319	1193	.21	Portugal[b]	1550	261	1289	.16
Austria[b]	1509	534	975	.35	Iceland[b]	797	401	396	.50	Puerto Rico[c]	712	161	551	.22
Azerbaijan[b]	1504	661	843	.43	India[a]	1778	414	1364	.23	Romania[a]	1685	342	1343	.20
Bangladesh[c]	1483	349	1134	.23	Indonesia[a]	1775	755	1020	.42	Russia[a]	1904	509	1395	.26
Belarus[b]	1499	613	886	.40	Iran[a]	2647	281	2366	.10	Rwanda[a]	1499	73	1426	.04
Belgium[b]	1509	519	990	.34	Iraq[a]	2555	1043	1512	.40	Saudi Arabia[c]	1431	759	672	.53
Bosnia & Herz.[b]	1490	389	1101	.26	Ireland[b]	1008	383	625	.37	Serbia[a]	1086	166	920	.15
Brazil[a]	1478	136	1342	.09	Israel[c]	1168	274	894	.23	Singapore[c]	1496	220	1276	.14
Bulgaria[a]	883	194	689	.21	Italy[a]	953	278	675	.29	Slovakia[b]	1458	180	1278	.12
Burkina Faso[a]	1443	212	1231	.14	Japan[a]	1026	401	625	.39	Slovenia[a]	999	181	818	.18
Canada[a]	2107	888	1219	.42	Jordan[a]	1191	373	818	.31	South Africa[a]	2967	519	2448	.17
Chile[a]	984	122	862	.12	Korea[a]	1184	357	827	.30	Spain[a]	1184	236	948	.19
China[a]	1873	979	894	.52	Kyrgyzstan[c]	1038	173	865	.16	Sweden[a]	963	655	308	.68
Colombia[a]	2993	433	2560	.14	Latvia[b]	1482	374	1108	.25	Switzerland[a]	1187	606	581	.51
Croatia[b]	1513	290	1223	.19	Lithuania[b]	1471	418	1053	.28	Thailand[a]	1525	633	892	.41
Cyprus[a]	1037	133	904	.12	Luxembourg[b]	1587	475	1112	.29	Taiwan[a]	1225	297	928	.24
Czech Republic[b]	1798	527	1271	.29	Macedonia[b]	1443	273	1170	.18	Tanzania[c]	1112	90	1022	.08
Denmark[b]	1506	1130	376	.75	Malaysia[a]	1201	106	1095	.08	Trinidad & T.[a]	1000	38	962	.03
Dominican Rep.[d]	397	105	292	.26	Mali[a]	1303	228	1075	.17	Turkey[a]	1339	64	1275	.04
Egypt[a]	3045	561	2484	.18	Malta[b]	1487	309	1178	.20	Uganda[c]	998	78	920	.07
El Salvador[d]	1210	177	1033	.14	Mexico[a]	1548	241	1307	.15	Ukraine[a]	891	252	639	.28
Estonia[b]	1516	486	1030	.32	Moldova[a]	1030	184	846	.17	United States[a]	1241	491	750	.39
Ethiopia[a]	1314	321	993	.24	Montenegro[b]	1486	360	1126	.24	Uruguay[a]	865	246	619	.28
Finland[a]	1000	588	412	.58	Morocco[a]	1177	153	1024	.12	Venezuela[c]	1193	190	1003	.15
France[a]	996	186	810	.18	Netherlands[a]	996	443	553	.44	Viet Nam[a]	1460	761	699	.52
Georgia[a]	1455	264	1191	.18	New Zealand[a]	905	463	442	.51	Zambia[a]	1403	162	1241	.11
Germany[a]	1898	647	1251	.34	Nigeria[c]	2001	512	1489	.25	Zimbabwe[c]	984	110	874	.11

[a] Wave 2005-2007 of the World Values Survey (WVS); [b] wave 2008 of the European Value Survey; [c] wave 1999-2004 of the WVS; [d] wave 1994-1999 of the WVS. "N" represents the number of observations. Data source: EVS/WVS

Table 8: *Descriptive statistics for the "Trust question" in the GSS.*

Country	N	"Trust most people"	"Can't be too careful"	"Depends"	*Inherited trust*
Austria	83	39	38	6	.47
Belgium	21	10	11	0	.47
Canada	282	127	142	13	.45
China	27	12	14	1	.44
Czech Republic	202	97	95	10	.48
Denmark	81	46	32	3	.57
Finland	62	31	27	12	.5
France	128	51	65	57	.44
Germany	1312	574	681	57	.44
Greece	59	20	32	7	.34
Hungary	92	39	49	4	.42
India	10	2	6	2	.2
Ireland	797	430	335	32	.54
Italy	918	350	526	42	.38
Japan	43	20	21	2	.46
Lithuania	47	20	24	3	.42
Mexico	422	112	297	13	.26
Netherlands	127	63	57	7	.5
Norway	239	137	95	7	.57
Philippines	24	8	16	20	.33
Poland	465	213	227	25	.46
Portugal	45	15	24	6	.33
Romania	17	4	12	1	.23
Russia	205	98	94	13	.48
Spain	68	29	35	4	.43
Sweden	215	114	89	12	.53
Switzerland	43	23	19	1	.53
United Kingdom	791	430	328	33	.54

"N" represents the number of US-born American residents with at least one abroad-born ancestor. Canada summarizes the entries for "French Canada" and "Other Canada"; United Kingdom summarizes the entries for "England & Wales" and "Scotland"; Czech Republic contains the observations for "Czechoslovakia". Data source: GSS.