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Lost in translation? The effect of cultural values on mergers around the world ☆

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ABSTRACT

We find strong evidence that three key dimensions of national culture (trust, hierarchy, and individualism) affect merger volume and synergy gains. The volume of cross-border mergers is lower when countries are more culturally distant. In addition, greater cultural distance in trust and individualism leads to lower combined announcement returns. These findings are robust to year and country-level fixed effects, time-varying country-pair and deal-level variables, as well as instrumental variables for cultural differences based on genetic and somatic differences. The results are the first large-scale evidence that cultural differences have substantial impacts on multiple aspects of cross-border mergers.

1. Introduction

Recent research documents that cultural values impact an impressive array of financial outcomes in markets worldwide. For instance, cultural differences between countries affect foreign direct investment (Guiso, Sapienza, and Zingales, 2009), equity investment (Hwang, 2011), and venture-capital flows (Bottazzi, Da Rin, and Hellmann, 2010). Interest rates are lower when borrowers and lenders share common cultural values (Giannetti and Yafeh, 2012). In addition, stock market participation and stock price momentum are both affected by national cultural values (Guiso, Sapienza, and Zingales, 2008; Chui, Titman, and Wei, 2010).

Cultural differences are likely to be especially important in cross-border mergers, where people with possibly conflicting values have to coordinate with each other. Though anecdotal evidence of culture clash in cross-border mergers is widespread (e.g., Daimler-Chrysler) and it is well known that culture affects fundamental economic decision-making (Guiso, Sapienza, and Zingales, 2006), there is little research on the role of cultural differences in cross-border mergers. At the same time, understanding cross-border mergers has

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become especially important—during the last decade, the number of cross-border mergers nearly doubled, from 23% of total mergers in 1998 to 45% in 2007 (Erel, Liao, and Weisbach, 2012). In this paper, we provide some of the first large-scale evidence to show that national cultural differences have substantial impacts on multiple aspects of mergers, including where mergers occur and the gains they create.

First, like geographic distance, we suggest that greater cultural distance between merging firms could reduce the likelihood of a successful merger. Synergy gains in mergers require post-merger coordination between the employees of each firm. If employees do not share similar cultural values, impediments such as mistrust, misunderstanding, or mismatched goals could reduce coordination. For instance, it is more acceptable to question authority in some cultures than it is in others. Likewise, in some cultures, teamwork is valued above individual aspirations, whereas in other cultures, it is the opposite. Cultural differences such as these could make post-merger coordination more difficult and hence, the realization of synergies less likely.

In contrast, greater cultural distance could increase the likelihood of a successful merger if cultural diversity facilitates innovation and promotes new approaches to problem solving (Page, 2007). For instance, employees with different cultural values could introduce alternatives to the status quo which lead to greater efficiency. A third alternative is that cultural differences could have no impact if market forces, contracts, and incentive devices overcome potential cultural barriers.

To test our hypotheses, we apply a 'gravity' model of international trade to mergers. A gravity model, such as in Frankel and Romer (1999), uses geographic distance to predict the intensity of cross-country relations. We follow this approach but we measure distance in cultural space, not just geographic space. Specifically, we measure cultural distance along the three dimensions most commonly identified in sociology and economics: 1. Trust versus distrust (whether people believe that others can be trusted); 2. Hierarchy versus egalitarianism (whether people believe they should follow the rules dictated by higher authorities); and 3. Individualism versus collectivism (whether people believe they should sacrifice personal gains for the greater good of all).

Using these dimensions of culture, in a large sample of mergers from 52 countries between 1991 and 2008, we find strong evidence that differences in national culture reduce the volume of cross-border mergers, while controlling for a host of other possible determinants. These results are consistent with the hypothesis that cultural differences impede cross-border mergers. In particular, we find that the greater is the distance between two countries along each of the three cultural dimensions, the smaller is the volume of cross-border mergers between the countries. The size of the effect is substantial. Two countries that are at the 75th percentile of cultural distance experience about half as many mergers as two countries at the 25th percentile.

Greater cultural distance also leads to lower synergy gains, as proxied by the combined announcement returns of acquirers and targets. In multivariate regressions accounting for a host of potentially correlated effects, we find that a change from the 25th to the 75th percentile in the distance between trustfulness or individualism leads to a reduction in gains of about 28% of the median combined announcement return. For average-sized firms, the expected loss is about $50 million. Thus, cultural differences impose substantial costs in cross-border mergers, all else equal. Yet, cross-border mergers occur because they create value. In univariate tests, we find that the combined returns in cross-border mergers are higher than in domestic mergers (3.64% compared to 2.52%), though the acquirer's gains are not statistically different. These findings imply that in our sample of completed cross-border deals, the potential synergies are large enough to overcome cultural barriers and exceed the value of potential competing bids by domestic acquirers, even though the marginal effect of cultural distance is negative.

We also find, consistent with prior studies, that other national characteristics, besides culture, influence cross-border mergers. For instance, the legal origin of a country, or the quality of its institutions are related to where mergers occur and the value they create. In addition, other sociological variables, such as religion and language, affect mergers. To control for these effects, in all of our tests we include both acquirer and target country fixed effects, year effects, domestic benchmarks, time-varying country-level characteristics, and country-pair characteristics, such as shared legal systems, religion, language, tax and investment treaties, and currency exchange ratios. Thus, we isolate the effect of differences in national culture from country-level characteristics.

However, we recognize that some national legal institutions are likely to be interrelated with culture. To precisely identify the role of culture in these settings requires an exogenous shock to national culture, independent of national institutions. Such an event is highly unlikely. Moreover, if one could identify such an exogenous change in national culture, it is unlikely that the results would generalize to the majority of global cross-border mergers. For these reasons, we choose to take as general an approach as possible, and to control for alternative explanations using instrumental variables. In particular, to control for endogeneity and reverse causality, we instrument for national cultural differences using genetic and somatic differences across countries and find that our results are unchanged.

In an additional robustness test we look at interregional mergers within the United States. In this setting, national institutional details are the same across all regions, but cultural values vary. We again find that cultural differences along all three dimensions reduce the likelihood of interregional mergers. Though there is some evidence that changes to political institutions cause cultural values to change (Alesina and Fuchs-Schündeln, 2007), our findings are consistent with the majority of research that shows that culture is a stronger determinant of institutions than vice versa (Licht, Goldschmidt, and Schwartz, 2007; Tabellini, 2008; Gorodnichenko and Roland, 2010; Guiso, Sapienza, and Zingales, 2010).

We provide a number of other robustness checks on our main results. In particular, in our main specifications, we use cultural value measures from the World Values

Survey, a standard data source in the literature. However, we also find similar results if we use the alternative measures of cultural values developed in Hofstede (1980, 2001) or in Schwartz (1994). Second, since U.S. firms account for a large number of mergers, we exclude all U.S. firms from our sample in robustness tests. Our qualitative results are unchanged and in most cases strengthened. Finally, one could argue that our results are driven by cultural differences in investor responses, rather than real merger effects. We address this criticism in two ways. First, we document that national culture affects the actual incidence of mergers, not only the market responses to merger announcements. Second, we investigate the effects of national culture on long-run stock market returns. We do not find any evidence that changes our prior conclusions.

To the best of our knowledge, this is one of the first comprehensive studies of the effect of national culture on merger outcomes. The richness of data on mergers allows us to study culture's influence on the gains from trade, not only the volume of cross-border trade. Siegel, Licht, and Schwartz (2011) also study how mergers are affected by differences in egalitarianism. More generally, our paper contributes to a growing field of research that considers the role of culture in economics. Experimental evidence shows that deep-seated values of fairness, trust, and individualism affect fundamental economic decisions (Oosterbeek, Sloof, and Van de Kuilen, 2004; Brett, Adair, Lempereur, Okumura, Shikhirev, Tinsley, and Lytle, 1998; Adair, Brett, Lempereur, Okumura, Shikhirev, Tinsley, and Lytle, 2004; Barr, Wallace, Ensminger, Henrich, Barrett, Bolyanatz, Cardenas, Gurven, Gwako, Lesorogol, Marlowe, McElreath, Tracer, and Ziker, 2009). Evidence from non-experimental settings also confirms the importance of culture on economic decision-making (Guiso, Sapienza, and Zingales, 2006, 2008, 2009; Chui, Titman, and Wei, 2010; Li, Griffin, Yue, and Zhao, 2011; Giannetti and Yafeh, 2012; Gorodnichenko and Roland, 2010). Our paper also relates to a line of research that studies the role of formal institutions on cross-border mergers (Rossi and Volpin, 2004; Moeller and Schlingemann, 2005; Bris and Cabolis, 2008; Chari, Ouimet, and Tesar, 2010; Ferreira, Massa, and Matos, 2010; Dinç and Erel, 2010; Ellis, Moeller, Schlingemann, and Stulz, 2011).

The rest of this paper is organized as follows. Section 2 describes the three dimensions of cultural values studied in this paper and develops empirical predictions. Section 3 describes the data used in this paper and documents the prevalence of international mergers. In Section 4, we present empirical tests of the effect of culture on merger volumes and combined returns. Robustness checks are presented in Section 5. Section 6 presents concluding remarks.

2. Theory and hypotheses

Assuming that a manager seeks to create shareholder wealth, she will undertake mergers that create positive net present value. The potential gains of a merger are determined by the synergies specific to a particular acquirer and target. These merger-specific synergies arise from lower costs or increased revenue, based on the interaction of the economic fundamentals of the two firms. Since the synergies are based on economic fundamentals, merger partners could potentially be found domestically or internationally, wherever the potential synergies exist. Cross-border mergers could in fact promise greater value than domestic mergers because they include a larger pool of potential merger partners, which would allow for greater potential synergies. Additionally, cross-border mergers could generate more value because they offer greater growth potential in new markets, allow for more efficient distribution systems, or improve upon more serious managerial deficiencies, among many other reasons.

Of course, the net value of the merger must take into account that the costs of integrating the two firms will erode the potential synergy gains. Though there is not much academic research on integration costs, consulting firms, the business press, and many practitioner-oriented books have emphasized the role of integration as a first-order determinant of merger success (e.g., Harding and Rovit, 2004; Lajoux, 2006). Integration costs could be related to multiple aspects of the merger, including geographic distance, complexity of the firms, or whether the merger is vertical or horizontal. In virtually all cases, whether synergies are driven by reduced costs or greater revenues, the core of integration involves employees of the acquirer and target firms working together in coordination. Without teamwork, the firm would operate as two separate entities under common ownership and no value is likely to be created.

If employee teamwork is central to successful integration, than differences in employees' cultural values are likely to affect their ability to work together. Following Guiso, Sapienza, and Zingales (2006), we define culture as, "those customary beliefs and values that ethnic, religious, and social groups transmit fairly unchanged from generation to generation." As Guiso et al. argue, focusing on beliefs and values allows this idea of culture to easily fit into the classical economic framework based on individual preferences. In fact, much of the recent work in theoretical behavioral economics introduces nonstandard preferences into an agent's utility function. For instance, preferences for fairness can affect an individual's choice of occupation and wage contracts (Bartling, Fehr, Maréchal, and Schunk, 2009; Fehr, Goette, and Zehnder, 2009), as can preferences for social esteem (Ellingsen and Johannesson, 2007, 2008). Honesty and intrinsic motivation, rather than extrinsic motivation, could affect an individual's economic choices (Frey, 1997). Thus, cultural values are likely to affect the economic and work preferences of individuals in significant ways.

We argue that differences in the cultural values of employees of the merged firm will make teamwork and coordination more difficult, and hence increase integration costs. First, a long line of psychology research shows that people exhibit intergroup bias (Hewstone, Rubin, and Willis, 2002). Thus, managers could have inefficient preferences for workers who share their own cultural values. Additionally, employees are likely to prefer working with coworkers who share common cultural values, at the cost of potential efficiency losses. Next, Arrow (1974) and Akerlof (1997) both provide theoretical arguments that greater social distance inhibits communication within an

organization and adversely affects its ability to make effective decisions. These ideas are confirmed in experimental research that shows that greater social distance reduces coordination among players (Hoffman, McCabe, and Smith, 1996, 1999; Glaeser, Laibson, Scheinkman, and Soutter, 2000; Fershtman and Gneezy, 2001).

These arguments suggest that cultural distance imposes an additional cost on merging firms, reducing the net present value (NPV) of a deal. As cultural distance increases and net benefits decrease, fewer mergers will be positive NPV projects. Thus, at a national level, we expect that greater cultural distance between two countries will be associated with fewer cross-country mergers, as fewer mergers will clear the hurdle rate for making a bid. In addition, controlling for all other effects, cultural distance will likely have a negative marginal effect on the gains. However, cross-border mergers that do occur are expected to generate equivalent or better overall gains than would a competing domestic bidder. This means that the mergers that do occur between culturally distant countries are likely to have stronger unobservable fundamentals in order to overcome the burden of additional integration costs.

A simple model will illustrate these predictions. Consider a domestic bidder (D) and a cross-border bidder (CB) competing for the same target. They both draw a signal X of synergies S from a uniform distribution on [0, 1]. The cross-border bidder bears additional integration costs $0 < C < 1$ due to cultural distance. Without overpaying, the cross-border bidder will only win the acquisition when $E[S|X_{cb}]-C > E[S|X_d]$. For simplicity, assume that expected synergies S equal the signal X: $E[S|X] = X$. Therefore, the cross-border bidder will acquire the target only if $X_{cb}-C > X_d$, or $X_{cb}-X_d > C$. The probability that the cross-border bidder wins the competition is $\Pr(X_{cb}-X_d > C) = (1-C)^2/2$. (Full details are available in Appendix A.) As the cultural distance costs C increase, the probability that the cross-border bidder wins decreases, but as long as C is not too high, there is a positive probability that the cross-border bidder will win.

The expected synergy gains of the cross-border bidder, conditional on the cross-border bidder winning the deal, are $E[E[X_{cb}|X_{cb} > X_d+C]] = \int\int x_{cb} \cdot f(x_{cb}|x_{cb} > x_d+C) \cdot dx_{cb}\, dx_d = (2+C)/3$. Subtracting the costs of cultural distance, the net value gain to the cross-border bidder when it wins the acquisition is $\frac{2}{3}(1-C)$. Because the cross-border bidder received a random signal that was high enough to overcome the domestic bidder's signal, even after accounting for the cultural distance costs, it wins the bid and has a positive gain. At the same time, the derivative of the value gains with respect to the cultural distance cost C is $-\frac{2}{3} < 0$. This means that though the cross-border bidder wins, the marginal effect of cultural distance is negative.

To summarize, this simple model reiterates three predictions:

1. The likelihood of a merger between culturally distant firms decreases as cultural distance costs increase.
2. Conditional on the cross-border bidder winning the acquisition, the value created by the cross-border bidder net of costs is greater than the value created by the domestic bidder.
3. Cultural distance costs have a negative effect on the value created in mergers.

Contrary to this model, an alternative hypothesis is that cultural diversity increases an organization's effectiveness. Research in the management literature suggests that different cultural backgrounds of employees provide resources that can be shared within the organization to increase efficiency (Ely and Thomas, 2001; Page, 2007). For instance, following a cross-cultural merger, individualistic employees could learn better teamwork skills from collectivist employees. Likewise, collectivist employees could learn how to manage tasks better as individuals rather than in a group setting. Others have argued that cultural diversity facilitates a more flexible organization that can better respond to a change in its working environment (Carrillo and Gromb, 2007). Similarly, cross-cultural mergers could provide greater diversity of resources than can be built internally. The firm can draw upon this diversity to overcome unexpected hurdles (Morosini, Shane, and Singh, 1998). These arguments suggest that rather than imposing costly impediments to integration, greater cultural differences could lead to more effective and profitable firms. Thus, this hypothesis predicts that greater cultural distance will be associated with a greater incidence of mergers with greater joint gains.

Finally, it is not obvious that culture should matter at all. If the economic rationale underpinning a merger is sound, then one could argue that cultural differences would play only a minor role in the success of a merger. The large stakes involved in mergers, where gains or losses can be consequential, provide strong incentives for management to overcome any obstacles to realizing potential synergy gains. In addition, market forces could lead to contracts and incentive schemes that overcome cultural differences. Culture would also be unimportant for mergers if cultural values only influence non-work activities such as contributions to social capital, marriage, and family life. In this case, employees are more or less the same globally and their personal cultural values would be unrelated to their ability to work together. If this were the case, we expect to find no significant relationship between cultural differences and the incidence or gains of mergers.

We are careful to differentiate our notion of national culture from corporate culture. Weber, Shenkar, and Raveh (1996) present evidence that national culture is defined by deep-held values, whereas corporate culture is defined by a set of operational practices. Using survey responses from chief executive officers (CEOs), they find that national cultural differences predict stress, negative attitudes towards the merger, and lack of cooperation better than do corporate cultural differences. Weber et al. argue that differences in national culture will impose a greater impediment to realizing synergy gains in mergers than will corporate culture, because operating practices are less rigid than are cultural values.

2.1. Cultural dimensions

Since not all beliefs and values would be expected to affect economic decisions, we focus on three values that

prior studies in economics, psychology, sociology, and negotiation have identified as important dimensions of culture: trust, hierarchy, and individualism. First, trust has been studied extensively in finance and economics in various contexts (see Guiso, Sapienza, and Zingales, 2006, for references). Second, though the particular dimensions used in cultural classification systems tend to be idiosyncratic, both hierarchy and individualism are shared by the most widely cited classifications, with only minor variations. In particular, hierarchy and individualism are the only two dimensions common to the five-dimension classification system of Hofstede (1980, 2001), the three-dimension system of Schwartz (1994), the seven-dimension system of Trompenaars (1993), and the four-dimension system of Fiske (1991). Thus, there is a large literature that suggests that these three dimensions are essential characteristics in the description of a country's cultural values.

It is important to note that our three cultural dimensions are society-level dimensions. In particular, our concept of trustfulness differs from the idea of bilateral cross-border trust studied in Guiso, Sapienza, and Zingales (2009). In their paper, the focus is on the trust levels between a particular country-pair, such as how much Germans trust Italians. Instead, we are interested in measuring the general values of culture within a country and then comparing these values across countries. This means we are comparing the general level of trust of one country to another. Since hierarchy and individualism are also society-level dimensions of culture and do not have cross-cultural directionality (i.e., the residents of one country are not individualistic *towards* another country), our society-level concept of culture is consistent across all three dimensions.[1] Next, we describe these dimensions of national culture in detail.

2.1.1. Trust versus distrust

Trust is the dependence on another to fulfill an implicit or explicit obligation. As far back as Arrow (1972), economics scholars have recognized that trust facilitates trade. In economic transactions characterized by uncertainty, trust is the confidence that a counterparty will fulfill her side of the deal. In addition, trust could substitute or complement legal statutes that govern transactions. Zak and Knack (2001) build a theoretical model where a lack of trust leads to costly monitoring.[2] This is particularly relevant for cross-border mergers where accurate valuations are unlikely and where post-merger integration will require non-contractible effort by both firms.

If trust facilitates trade, one can argue that trust makes mergers either more or less common. One argument is that cultures that have greater amounts of trustfulness of others will be more likely to buy and sell firms through mergers. The total gains from mergers are also expected to be higher when there is more trust because it could facilitate post-merger cooperation. A counter-argument is that mergers are likely to be observed when arm's-length trading relations break down. The theories of transaction cost economics (Williamson, 1975, 1979, 1985) and the property rights theory of the firm (Grossman and Hart, 1986; Hart and Moore, 1990; Hart, 1995) predict that if the costs of incomplete contracts are too high, assets will be organized under common ownership to reduce hold-up and underinvestment problems. Thus, if trust facilitates arm's-length contracting rather than mergers, we could observe *fewer* mergers that involve firms in countries where people are more trusting of others.

2.1.2. Hierarchy versus egalitarianism

Egalitarian cultures rank the importance and social power of all members relatively equally, whereas hierarchical cultures delineate members into multiple vertical ranks of power. In hierarchical cultures, members from lower ranks defer to higher ranked members, who in turn have an obligation to ensure that the needs of lower ranked members are satisfied. When two equally ranked members disagree, they allow a higher ranked member to arbitrate. In a firm, this means that workers are more likely to follow instructions from superiors in hierarchical cultures. Workers in egalitarian cultures, in contrast, are more likely to think of themselves as equals with their superiors (Brett and Okumura, 1998).

We expect that differences in hierarchy will reduce the total volume of mergers, as well as the combined gains from mergers, since cultural differences are likely to impede post-merger integration. In particular, as suggested before, differences in the norms of dialogue between workers and their superiors are likely to reduce effective cooperation between firms. Hierarchical bosses could not understand that egalitarian workers are unlikely to follow their orders without justification. Likewise, egalitarian bosses could not be respected by hierarchical workers if the boss treats workers as her equal. These examples are merely to illustrate the mechanism through which cultural values could inhibit coordination; other forms of interpersonal frictions are possible. We simply argue that cultural differences create frictions when firms attempt to merge their operations.

2.1.3. Individualism versus collectivism

A society could view individuals as autonomous or as members of a larger social group. In societies where individualism is the norm, individual-level accomplishments are rewarded and goals are independent of the overall society's goals. It is accepted and expected that agents will seek to maximize their self-interest, without regard to the well-being of society-at-large. In contrast, collectivist cultures emphasize group goals, and the aspirations of individuals are tied to social obligations. It is expected that individuals will sacrifice personal self-interest for the benefit of the group (Brett and Okumura, 1998; Brett, 2000). As with other cultural values, there is little theoretical research in economics that tries to understand the role of individualism, though recent exceptions are Tabellini (2008) and Gorodnichenko and Roland (2010).

As before, we expect that differences in individualism will impede the firms from realizing synergy gains. Collectivist

[1] To verify consistency with existing research, using the data on bilateral trust between European countries reported in Guiso, Sapienza, and Zingales (2009), we find that bilateral trust is a significant predictor of cross-border merger activity. When acquirer nations are more trusting of target nations, or vice versa, there are greater numbers of cross-border mergers between the two countries.

[2] See Carlin, Dorobantu, and Viswanathan (2009) for a recent theoretical model that incorporates trust.

employees could not wish to work with individualistic employees, because they do not share the same goals. Likewise, individualist employees could not understand the goals of collectivist employees. For these and other reasons, it is plausible that combining individualist with collectivist employees could inhibit the operations of the firm more than combining employees who share the same cultural values.

3. Data sources

3.1. Merger data

For our tests of cross-border merger activity, we start with as large a sample of mergers as possible, which due to constraints on other variables will be reduced in subsequent tests. Our initial sample includes all completed mergers from Securities Data Company (SDC) Platinum database valued at $1 million or more from 1985 through 2008 where more than 50% of the target is acquired. We exclude any deal with firms that SDC records as multinational or of unknown location. We place no restrictions on the public status of the acquirer or target, which means we include public, private, and subsidiary acquirers and targets, though government entities are excluded. Since private firms account for the majority of merger targets, this sampling procedure provides a much more complete sample than is typically used in merger studies. For each deal we record the form of payment, the industry classifications of the acquirer and target, the attitude of the deal (friendly/hostile), and other deal-specific information from SDC.

The data filter yields a sample of 127,950 mergers, of which 30,907 are cross-border deals, and 65,796 do not include a U.S. acquirer or target. A detailed cross-country matrix of the 30 nations with the most firms that are acquired is presented in Table 1. The top five target nations (including domestic deals) are the U.S. (55,407 targets), the U.K. (21,689), Canada (6,752), Australia (6,128), and Japan (3,513). The U.S. is the leader by far and there is a sharp dropoff in merger activity for the next most active market. Sweden, the tenth largest nation by targets, had 1,688 deals over 1985–2008, which is less than half as many as Japan, the fifth largest, and only 3% of the U.S.'s total.

Fig. 1 presents a map of worldwide merger activity for the 20 largest domestic markets to illustrate the complexity of international merger relations. The size of each country's abbreviation is proportional to the number of domestic mergers and the size of the arrows connecting countries is proportional to their cross-border merger activity over 1985–2008. The visualization is taken directly from the data, with the exception of the U.S., which is scaled by half and is still the largest domestic market. This picture reveals a complex network of cross-border merger flows where trading partners are clearly not random. For instance, both the U.S. and Canada, and the U.S. and the U.K., have strong cross-border merger ties, but Canada and the U.K. have relatively few cross-border deals. In addition, some of the largest domestic markets have few cross-border mergers. Japan is the most notable example, but Australia and Malaysia are similarly isolated. The last row in Table 1 reports the percentage of foreign-made acquisitions in each of the 30 top nations. Less than 6% of acquisitions of Japanese companies are made by non-Japanese firms, compared to 24% for the entire world. In contrast, over two-thirds of acquisitions are made by foreign acquirers in Germany, the seventh largest target nation. Clearly, cross-border mergers are not randomly assigned across country-pairs.

Fig. 2 shows cross-border mergers have increased substantially since the 1990s and that firms are buying targets in many more foreign countries. All five of the top target nations in cross-border mergers (U.S., U.K., Canada, Germany, and France) have witnessed increased numbers of acquisitions, but by far the most striking pattern is the number of cross-border mergers where targets are in countries that are not in the top five most active markets. In fact, the number of cross-border mergers at the peak of the 2000s wave was larger than the number of cross-border mergers in the 1990s wave, mainly due to acquisitions outside the top five target nations. Both of these figures provide strong evidence that research must account for cross-border and foreign-based acquisitions if it is to be relevant in today's M&A environment.

Due to data restrictions on our other variables (described below), our original sample of 127,950 is reduced to 104,652 mergers with 20,893 cross-border mergers and 83,759 domestic mergers across 52 different countries. These mergers are aggregated into 27,753 country-pair-years, including domestic mergers, that form the sample we use to test the role of culture on the volume of cross-border merger activity. The domestic mergers serve as a benchmark for merger volume where no national cultural differences exist.

In later analysis we investigate the role of culture on the wealth effects of mergers. In order to measure value creation in mergers, we are forced to use mergers where both acquirers and targets are publicly traded firms with available stock price data. We take stock price data from Compustat Global Security Issue database and Center for Research in Security Prices (CRSP) for U.S. companies. For each deal we compute the acquirer's and target's abnormal returns in the three days surrounding the announcement of the merger. Abnormal returns are calculated by subtracting the Datastream country index of the firm's host country from the firm's daily return. We take the sum over three days to generate a cumulative abnormal return (CAR). We use these CARs to create our variable of interest, the combined CAR, which is simply the average of the acquirer's and target's CAR, weighted by each firm's market value two days before the announcement. We omit the deals with announcement returns above the 99th and below the 1st percentile to remove outliers. We also exclude mergers where the transaction size is less than 1% of the market value of the acquirer.

These restrictions limit the size of this subsample, though the scope is still relatively large. This subsample includes 827 cross-border mergers where acquirers are from 35 different countries and targets from 38 countries. The reduction in the sample size is driven primarily by the relative scarcity of acquisitions of public targets by public acquirers, rather than missing stock price data. Without any further data restrictions on firm-level accounting variables

Table 1
Number of mergers in the 30 largest target nations, 1985–2008.

Data are from SDC Platinum M&A Database. Acquiring nations are listed on the row variables and target nations on the columns. The countries are rank ordered by the number of target firms in each country. Values in the total column and row include all mergers, not just mergers from the top 30 markets. Only mergers where more than 50% of the target shares are owned by the acquirer after the merger are included. Government-owned firms and firms with an unknown public status are excluded.

	Target nation																														
	US	UK	CA	AU	JP	FR	WG	IT	SP	SW	CH	HK	NT	MA	BR	SA	SK	NO	SG	NZ	FN	IR	IN	DN	BL	SZ	AR	MX	PL	RU	Total
USA (US)	48,037	1621	1209	336	99	423	492	144	117	147	129	94	183	17	108	28	64	74	40	52	41	77	62	63	63	91	84	132	42	30	54,784
U.K. (UK)	2135	17,558	196	288	19	521	479	190	190	177	33	48	328	10	29	81	16	76	29	33	37	200	26	65	108	76	14	15	35	25	23,441
Canada (CA)	1535	171	4872	81	3	54	36	11	12	15	25	13	22	2	32	15	5	5	3	17	8	5	2	4	8	10	23	50	6	6	7263
Australia (AU)	313	158	42	4688	5	14	31	12	12	5	22	20	12	8	6	16	4	3	23	183	4	2	7	1	7	4	3	1	6		5722
Japan (JP)	384	76	13	27	3303	18	25	9	10	5	17	22	10	6	8	5	11	1	16	1	4		3	5	6	3		2	1	2	4043
France (FR)	264	202	30	17	4	1645	87	65	76	25	11	8	33		29	6	7	13	6	3	6	4	7	13	45	21	9	3	15	1	2769
Germany (WG)	245	192	17	24	6	97	833	35	44	39	9	2	33	5	14	5	8	11	7		11	6	12	20	16	34	1	3	22	2	1879
Italy (IT)	82	50	9	5		73	49	1362	45	3	6	1	17		14	7	1	4	2		1	3	2	2	10	18	9	4	6	4	1861
Spain (SP)	64	41	2	4	2	46	20	37	1245	3	3	3	7		41	2	3	2	1		7	1	1	2	5	4	36	23	7	1	1761
Sweden (SW)	122	109	13	17		41	61	21	19	926	3	2	27	2	1	4	5	92	2	1	87	4	3	75	11	17	1	4	10	9	1745
China (CH)	23	2	10	12	2	1	3	3			885	69	2				1		8	3		1		1		1	1			1	1044
Hong Kong (HK)	60	36	18	48	12	9	9	3	2	5	262	1095	2	13	3	3	9		37	6			8	1		2		2			1717
Netherlands (NT)	184	148	19	19	7	69	63	31	47	35	9	4	443	6	8	1	8	10	3	5	12	5	5	16	48	11	2	8	8	5	1337
Malaysia (MA)	15	15	4	31			5			1	14	24	2	1118	2	4	2	2	44	5			6	1		4					1356
Brazil (BR)	17	2	5	2	1	2	1	2	2				1		663			2									21	1			751
S Africa (SA)	34	67	6	43		2	4	3		1		3	3		1	794	1		1	2	1		2	1	1	2	1			1	1013
South Korea (SK)	37	3	4	5	5		4				31	5		2		2	733	1	2	1			4		1		1		3		865
Norway (NO)	24	59	12	5	1	14	21	1	10	100		1	8		2	1	2	498	4	1	16	3	2	38	4	3			6	2	872
Singapore (SG)	63	33	4	86	7	2	9	1		4	63	75	5	41	2	1	7	1	568	15	1		7	2	2	3		1			1104
New Zealand (NZ)	15	14	6	88			1	2			1	3	2		1					445						2		1			588
Finland (FN)	59	27	7	3		14	30	6	2	72	3	2	16	1	3			27	2		449		2	11	4	6		1	4	13	801
Ireland (IR)	140	320	3	8	2	11	22	1	7	7	1		31		3	1		2	1		4	355		4	6	2	2	3	3	1	959
India (IN)	106	53	7	11	1	11	12	5	5	1	2	1	1	3	2	3	1	1	13	1	3	3	439	2	3	3	2	1	1	2	740
Denmark (DN)	32	49	6	7		16	23	4	7	63	3	3	14	2	4	1	1	19	3	1	11	1	3	253	3	5		2	10		564
Belgium (BL)	61	41	3	6	1	70	27	9	9	5	2		31		4	1	3	2			3	2	4	5	209	7	2		1	2	541
Switzerland (SZ)	147	60	21	25	2	41	43	20	13	13	1	3	14	2	7	7	3	7		1	7	2	6	4	4	188	3	1	1	2	694
Argentina (AR)	5		1			1			2		1				13			1									296	3			337
Mexico (MX)	45		3	2					2					1	14			1					1				7	201			306
Poland (PL)		2					3		3	1			1													1			220	1	266
Russian Fed (RU)	18	9	6		1		1	4		1			5	1		1	1	1			2		1	1	1		1			287	397
Total	55,407	21,689	6752	6128	3513	3303	2551	2062	1970	1688	1602	1578	1315	1267	1070	1011	915	896	867	811	734	692	641	613	583	557	554	483	443	441	127,977
% Foreign acquirer	13.3	19.0	27.8	23.4	5.9	50.1	67.3	33.9	36.8	45.1	44.7	30.6	66.3	11.7	38.0	21.4	19.8	44.4	34.4	45.1	38.8	48.6	31.5	58.7	64.1	66.2	46.5	58.3	50.3	34.9	24.1

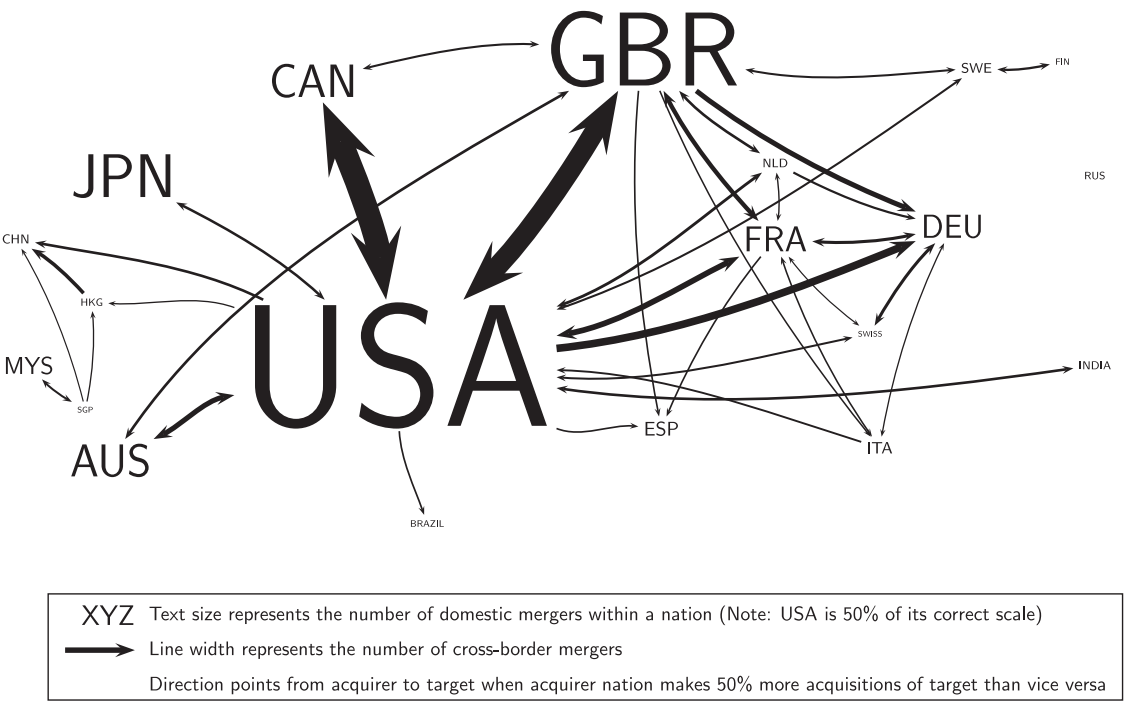

Fig. 1. Cross-border activity for the 20 most active domestic M&A markets 1985–2008. The 20 most active domestic merger markets are determined by the total number of domestic mergers over 1985–2008, where acquirers and targets are public, private, and subsidiary firms listed on SDC Thomson database.

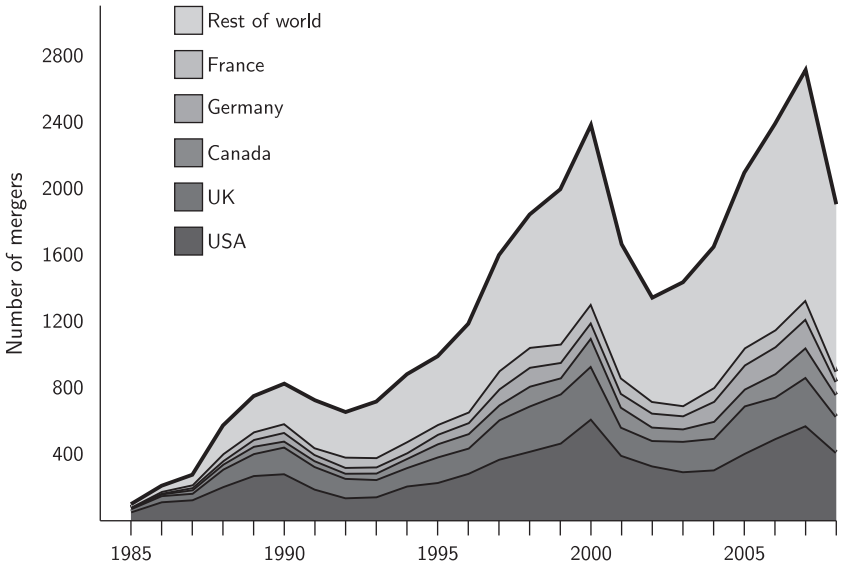

Fig. 2. Five largest cross-border merger markets. Largest cross-border target nations are determined by the number of cross-border mergers in 1985–2008 where the target firm was located in a particular country. Mergers include all public, private, and subsidiary targets and acquirers from SDC Thomson database.

or country-level variables, the number of public–public cross-border acquisitions in the SDC data in our time period is only 2,824, compared to 30,907 total cross-border mergers.

We also include a matched sample of domestic merger observations as a benchmark for the tests of wealth effects. For each of the 827 cross-border mergers in our sample, we search for a domestic merger from the acquirer's country and a domestic merger from the target's country matched by industry pairs, deal size, and year. Matched domestic mergers are selected by first identifying all domestic mergers in the same year and the same countries as the acquirer and the target in the cross-border merger. From this pool, we select mergers where the acquirers are in the same two-digit Standard Industrial Classification (SIC) code as the acquirer of the cross-border merger and targets are in the same two-digit SIC code as the target of the cross-border merger. If no domestic mergers meet these criteria, we relax the industry and year criteria, while maintaining the country

requirement.[3] Then, within the pool of matched domestic mergers, we select the merger that has a relative value of the deal closest to the cross-border merger. We follow this algorithm for both the acquirer country and the target country, providing up to two matched deals for each cross-border deal: one from the acquirer's country and one from the target's country. For example, for a cross-border merger between an Italian consumer products company and a small Swedish pharmaceutical company in 2005, we include (1) a merger between an Italian consumer products company and smaller Italian pharmaceutical company in 2005 and (2) a merger between a Swedish consumer products company and a smaller Swedish pharmaceutical company in 2005. The majority of the matched deals satisfy the first two criteria, though there are mergers where no match can be found, yielding a complete sample of 2,063 mergers. By including these matched mergers in our tests, we provide a benchmark where country, industry, cross-industry, and year effects are normalized, but cultural differences vary between domestic and cross-border mergers.

3.2. Empirical measures of cultural values

To measure national cultural values, we use the World Values Survey (WVS). The WVS is the largest study ever conducted on cultural values and covers 97 societies on six continents and samples from populations that represent more than 88% of the total world population. The survey is carried out in five waves of surveys in 1981–1984, 1989–1993, 1994–1998, 1999–2004, and 2005–2008. Sample respondents are randomly chosen to be representative across age, sex, occupation, and geographic region. The set of questions in each wave of the WVS is not stable over time. In order to have consistency, we start our study using the 1989–1993 wave because the survey questions we use to measure culture are in all of the following survey wave questionnaires. Though surveys are completed in waves, we know the exact year of each country's survey. Therefore, we match the most recent country-level and deal-level merger data to each survey year that includes all three questions we use to measure national cultural values (described below). Following this, for the rest of our study, our data cover the years 1991–2008.

Each survey consists of about 250 questions on a variety of topics. We focus on the questions that are most relevant for our dimensions of national culture.

1. *Trust versus distrust*: To measure trust, we use the question from the WVS which is as follows:

   Generally speaking, would you say that most people can be trusted or that you need to be very careful in dealing with people?

   This measure has been used extensively in prior research to measure trust (e.g., La Porta, Lopez-de-Silanes, Shleifer, and Vishny, 1997; Sapienza, Toldra, and Zingales, 2007; Guiso, Sapienza, and Zingales, 2008).

2. *Hierarchy versus egalitarianism*: To measure national attitudes toward hierarchy versus egalitarianism, we use the following question from the WVS:

   People have different ideas about following instructions at work. Some say that one should follow one's superior's instructions even when one does not fully agree with them. Other's say that one should follow one's superior's instructions only when one is convinced that they are right. With which of these two opinions do you agree?

   1. *Should follow instructions.*
   2. *Must be convinced first.*

   Those countries where people are more likely to follow instructions without question, are considered hierarchical. In egalitarian cultures, people look upon others as equals and so are more likely to require a satisfactory explanation before following orders (Au and Cheung, 2004).

3. *Individualism versus collectivism*: To measure individualism, we use the following question from the WVS:

   How would you place your views on this scale? 1 *means you completely agree with the statement on the left*; 10 *means you agree completely with the statement on the right*; *and if your views fall somewhere in between, you can choose any number in between.*

Incomes should be made more equal	*We need larger income differences as incentives for individual effort*

   Countries that are more individualistic place greater weight on individual effort than on ensuring everyone's benefit. This variables has also been used in prior research, including Guiso, Sapienza, and Zingales (2003) and Gabaix and Landier (2008).

We rescale the responses to each of the three questions to create measures that are bounded between zero and one and take the average response for each of the 97 countries in the sample.

Fig. 3 presents a scatter-plot of the 2001 country-level measures of the three cultural values we study. The relationship of values represented in Fig. 3 reveals a number of interesting patterns. First, the three measures are not correlated. The correlation between trust and hierarchy has a p-value of 0.157, between trust and individualism the p-value is 0.703, and the p-value for hierarchy and individualism is 0.253. Thus, each measure of cultural values is measuring something unique. Second, countries cluster together in predictable ways. Great Britain, Australia, New Zealand, Ireland, and South Africa form a tight cluster of countries that are slightly higher than the median in hierarchy and slightly below median in individualism, though with some variation in trust.

[3] If no firms are available, we match based on one-digit SIC codes in the same year and country. If still no mergers are available, we match based on two-digit SIC codes in any year in the same country, then if necessary, match based on one-digit SIC codes in any year in the same country, and finally we match on countries and at least one match for the one-digit SIC code of the acquirer or target.

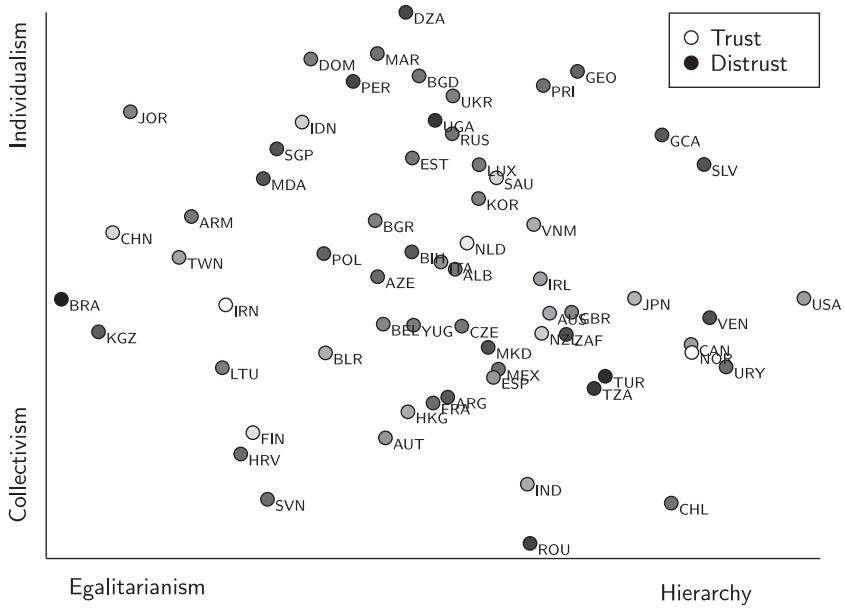

Fig. 3. Cultural values across nations. Each circle represents a country's relative scores from three questions on the World Values Survey, 1999–2004. Positioning along the horizontal axis indicates the country's degree of hierarchy vs. egalitarianism (measured as whether people believe they should follow instructions from a superior at work even if they do not agree vs. having to be convinced first). Positioning along the vertical axis indicates the country's degree of individualism vs. collectivism (measured as whether people believe income differences are an incentive for effort vs. whether incomes should be made more equal). The coloration of each circle indicates the country's degree of trust (measured as whether people believe most other people can be trusted or not). A lighter color indicates a more trusting country, a darker color indicates more distrust of others. Country abbreviations follow the three-digit International Organization for Standardization (ISO) codes.

Other clusters include Mexico, Spain, and Argentina; Guatemala and El Salvador; and Bosnia and Herzegovina, Bulgaria, Italy, and Albania.

Finally, we note that the U.S. is substantially separated from other countries on the hierarchy versus egalitarianism dimension. The U.S. scores the highest of all nations on our hierarchical measure, indicating that people in the U.S. are most likely to follow instructions without the need to be convinced. This reinforces our claim that understanding U.S. merger markets could not be enough to understand world merger markets. In a later section of the paper, we show that our results are robust even if we exclude U.S. firms from our analysis.

3.2.1. *Validity of the world values survey*

In this section, we address the construct validity of our measures of culture. The use of national survey data could introduce biases in our analysis in at least three ways. The first source of bias arises if survey responses are poor proxies for actual cultural values. Prior research contradicts this statement. Glaeser, Laibson, Scheinkman, and Soutter (2000) show that participants' survey responses of general trust are good predictors of actual trusting behavior in experimental settings with U.S. participants. Fehr, Fischbacher, von Rosenbladt, Schupp, and Wagner (2002) and Holm and Danielson (2005) find similar results in Germany and Sweden. In addition, Slonim and Roth (1998) and Cameron (1999) show that behavior observed in experimental tests of the ultimatum game are robust to increasing payoffs by factors of up to 40 times. These results provide evidence that survey-based measures of cultural values are good predictors of actual values in experimental settings, even when meaningfully large payoffs are at stake.

The second source of bias arises if the cultural values we study are not directly related to economic choices. To address this bias, we appeal to a large experimental literature on culture and economics. In cross-cultural experiments of ultimatum and trust games, a large number of prior papers consistently find that greater social proximity leads to greater trust, coordination, and sharing of gains (Hoffman, McCabe, and Smith, 1996, 1999; Glaeser, Laibson, Scheinkman, and Soutter, 2000; Fershtman and Gneezy, 2001; Buchan, Johnson, and Croson, 2006; Engel, 2011; Carpenter and Cardenas, 2011). Cross-cultural experimental evidence also shows that participants from collectivist cultures are more likely to work towards group goals than participants from individualistic cultures (Kim, Park, and Suzuki, 1990; Wagner, 1995; Kachelmeier and Shehata, 1997; Buchan, Croson, and Dawes, 2002; Wong and Hong, 2005). Negotiation styles also vary with national cultural values: participants from collectivist cultures are more cooperative in negotiations than participants from individualistic cultures (Parks and Vu, 1994; Wade-Benzoni, Brett, Tenbrunsel, Okumura, Moore, and Bazerman, 2002), participants from egalitarian cultures strive for equality, whereas hierarchical participants strive for self-interest (Tinsley and Pillutla, 1998), and participants in collectivist cultures generate greater joint outcomes than do participants in individualistic cultures (Arunachalam, Wall, and Chan, 1998). These results are found in a host of countries, including Austria, Brazil,

Canada, China, Germany, Greece, Hong Kong, Israel, Japan, Korea, Mexico, Taiwan, and the U.S.[4]

Furthermore, prior experimental research that specifically uses the World Values Survey suggests that our measures of culture identify salient differences in values that are related to economic decisions. Knack and Keefer (1997) cite experimental evidence from 15 countries that shows that variation in cross-country levels of observable trusting behavior correlate with trust levels reported in the WVS. Chuah, Hoffmann, Jones, and Williams (2009) report that Malaysian participants, identified as more collectivist by WVS responses, offer significantly higher offers in ultimatum game experiments than do British participants, identified as more individualistic. In public goods experiments, Gächter, Herrmann, and Thöni (2010) find that WVS-based measures of collectivism predict cooperative behavior. Thus, the preponderance of prior research finds a strong connection between differences in cultural values and differences in economic preferences and that cultural similarity leads to greater cooperation and greater joint gains.

Finally, a third potential source of bias would arise if the national cultural values recorded in the WVS did not reflect the cultural values of managers or employees of firms. We provide evidence that this is not the case. Using data from Management Diagnostics Ltd.'s Boardex database, in a sample of Standard and Poor's (S&P) 1500 companies headquartered in the United States over 2000–2009, we find that 97.7% of all CEOs are U.S. nationals. The remaining percentage of CEOs is spread across 22 different nationalities, where the next largest nationality is British, with 0.4% of all CEOs. For board members of these firms, 95.8% are Americans, with the remainder composed of 48 different nationalities. The large majority of European CEOs are also nationals of their company's country of residence. For example, in the Boardex data set, 90% of CEOs in Germany are German, 85% of CEOs in France are French, and 91% of CEOs in Italy are Italian. Though we do not have data on laborer nationality, it is reasonable to assume that they are most likely citizens of the country where their employer is headquartered. Moreover, if our sample firms are multinational, we could misidentify domestic mergers as cross-border and vice versa. Though we exclude any firm identified as a multinational in our tests, the unintended inclusion of a multinational firm will simply bias our tests against finding significant results. Therefore, we feel confident that country-level cultural values will be appropriate proxies for the cultural values held by the employees of a firm.

3.3. Other national institutions that affect mergers

As stated in the Introduction, other institutional environments have been shown to affect cross-border merger activity. Since these institutions are likely correlated with national cultural values, we control for them in our tests.

From La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1998), we record a nation's legal origin as French, German, or Scandinavian Civil Law or English Common Law. La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1998) show that common law countries typically have stronger legal protection for investors. We control for a country's size and individual wealth using gross domestic product (GDP) and GDP per capita from the Penn World Tables. We record the average corporate tax rate for each country, using data from the Economic Freedom Index. GDP per capita and tax rates could both proxy for the financial development of a country. Froot and Stein (1991) present a model and empirical evidence to show that currency exchange rates help explain cross-border investment patterns. Therefore, we record the historical exchange rate growth and volatility between each country-pair over the 12 months prior to the merger.

Next, we record if two countries have signed a double-taxation treaty or a bilateral investment treaty at the time of the merger announcement. Data are from the United Nations Conference on Trade and Development. Barthel, Busse, and Neumayer (2010) show that foreign direct investment (FDI) flows are larger between countries when they have signed a double-taxation treaty. See also Huizinga and Voget (2009) for the role of double-taxation treaties in cross-border mergers. Bilateral investment treaties provide assurances against nationalization of private enterprise and provide a framework to resolve investor disputes. To record a country's level of foreign trade, we calculate the ratio of imports and exports to GDP, which we call openness. In addition, we record the bilateral trade flows between each country-pair from the United Nations Comtrade database. Finally, we also separately account for the fraction of merger dollar volume involving public, private, and subsidiary targets since research shows significant differences between acquisitions of these three types of firms (Fuller, Netter, and Stegemoller, 2002).[5]

Religion and language are other cultural institutions that have been shown to affect economic outcomes (Barro and McCleary, 2003; Guiso, Sapienza, and Zingales, 2003). Following Stulz and Williamson (2003), for each country we record its primary spoken language and religion using data from the Central Intelligence Agency (CIA) World Factbook 2008. Last, since geographic distance is likely related to the costs of cross-border mergers and also to differences in culture, we control for geographic distance in two ways. First, we measure the shortest distance between each country's most important city (in terms of population) or its capital city, following the great circle formula. However, this would be a poor measure for the geographic closeness of many countries, such as the U.S. and Mexico. To address this type of geographical distance, we also record a dummy variable if two countries share a common border. These data are from Centre D'Etudes

[4] See Triandis, Carnevale, Gelfand, Robert, Wasti, Probst, Kashima, Dragonas, Chan, Chen, Kim, De Dreu, Van De Vliert, Iwao, Ohbuchi, and Schmitz (2001), Graf, Koeszegi, and Pesendorfer (2010), Curhan, Neale, Ross, and Rosencranz-Engelmann (2008), Kopelman (2009), Pearson and Stephan (1998), Morris, Williams, Leung, Larrick, Mendoza, Bhatnagar, Li, Kondo, Luo, and Hu (1998) and Adler, Graham, and Gehrke (1987). Fernández (2010) provide a recent review of the cross-cultural experimental literature and Bazerman, Curhan, Moore, and Valley (2000) provides a review of the social psychological approach to understanding negotiation.

[5] When no mergers are observed, these variables are recorded as zero to preserve sample size.

Table 2
Summary statistics of variables.

This table presents means, medians, and standard deviations for each variable. Observations are at the country-year level in Panel A, the country-pair-year level in Panel B, and deal-level in Panel C. Mergers in Panels A and B include all public, private, and subsidiary targets and acquirers from SDC Thomson database over 1991–2008. In Panel C, mergers only include public targets and acquirers. There are 27,086 cross-border country-pair-year observations and 27,753 cross-border and domestic country-pair-year observations in Panels A and B. There are 827 cross-border mergers, and 2,063 cross-border and matched domestic merger observations in Panel C. Matched domestic mergers include up to two matched domestic deals based on acquirer and target country-industry-size-year for each cross-border deal. Trust is measured as whether people believe most other people can be trusted or not. Hierarchy is measured as whether people believe they should follow instructions from a superior at work even if they do not agree vs. having to be convinced first. Individualism is measured as whether people believe income differences are an incentive for effort vs. whether incomes should be made more equal. $|\Delta|$ indicates the absolute difference between the acquirer and target nation. All variables are defined in Appendix B. Acquirer and target nations are listed in Table 1.

	Cross-border			Cross-border and matched domestic		
	Mean	Median	Standard deviation	Mean	Median	Standard deviation
Panel A: Country-level variables						
Trust	0.318	0.292	0.159	0.318	0.292	0.159
Hierarchy	0.477	0.484	0.105	0.477	0.484	0.105
Individualism	0.528	0.523	0.107	0.528	0.523	0.107
Muslim	0.095	0.000	0.294	0.095	0.000	0.293
Orthodox	0.041	0.000	0.199	0.041	0.000	0.199
Protestant	0.174	0.000	0.379	0.174	0.000	0.379
Roman Catholic	0.529	1.000	0.499	0.530	1.000	0.499
English Common Law	0.208	0.000	0.406	0.208	0.000	0.406
French Civil Law	0.421	0.000	0.494	0.421	0.000	0.494
German Civil Law	0.264	0.000	0.441	0.264	0.000	0.441
Scandinavian Civil Law	0.107	0.000	0.309	0.107	0.000	0.309
ln(Gross domestic product)	19.646	19.575	1.471	19.646	19.575	1.470
ln(GDP/capita)	0.018	0.017	0.012	0.018	0.017	0.012
Corporate tax rate	0.260	0.265	0.060	0.260	0.265	0.060
ln(Openness)	0.076	0.065	0.051	0.076	0.065	0.051
Panel B: Country-pair variables						
$\ln(1+\text{M\&A dollar volume}_{ijt})$	0.873	0.000	2.082	1.023	0.000	2.321
$\ln(1+\text{Number of M\&A}_{ijt})$	0.220	0.000	0.563	0.287	0.000	0.753
$\ln(1+\lvert\Delta\text{ Trust}\rvert)$	0.158	0.139	0.110	0.154	0.135	0.112
$\ln(1+\lvert\Delta\text{ Hierarchy}\rvert)$	0.110	0.095	0.078	0.107	0.091	0.079
$\ln(1+\lvert\Delta\text{ Individualism}\rvert)$	0.112	0.097	0.078	0.109	0.094	0.079
$\ln(1+\lvert\Delta\text{ Corporate tax rate}\rvert)$	0.065	0.058	0.047	0.064	0.054	0.047
Same religion	0.291	0.000	0.454	0.308	0.000	0.462
Same language	0.034	0.000	0.181	0.057	0.000	0.232
ln(Geographic distance)	8.494	8.931	1.035	8.420	8.903	1.136
Share border	0.047	0.000	0.211	0.070	0.000	0.254
Exchange rate volatility	0.047	0.000	0.829	0.046	0.000	0.819
Exchange rate growth	0.104	0.000	3.341	0.101	0.000	3.300
Double-tax treaty	0.617	1.000	0.486	0.626	1.000	0.484
Bilateral investment treaty	0.418	0.000	0.493	0.432	0.000	0.495
Same legal system	0.805	1.000	0.396	0.810	1.000	0.392
ln(Imports from acquirer country)	17.428	19.172	6.126	17.052	19.093	6.571
M&A private target fraction	0.051	0.000	0.202	0.054	0.000	0.204
M&A public target fraction	0.036	0.000	0.171	0.044	0.000	0.182
ln(Genetic distance)	5.487	6.839	2.366	5.355	6.765	2.484
ln(Somatic distance)	1.198	1.386	0.441	1.103	1.386	0.533
Panel C: Deal-level variables						
Combined $CAR_{(-1,+1)}$	0.036	0.021	0.075	0.028	0.022	0.069
Acquirer $CAR_{(-1,+1)}$	0.002	0.001	0.055	0.002	0.000	0.061
Target $CAR_{(-1,+1)}$	0.169	0.126	0.185	0.162	0.118	0.186
$\ln(1+\lvert\Delta\text{ Trust}\rvert)$	0.113	0.091	0.086	0.038	0.000	0.072
$\ln(1+\lvert\Delta\text{ Hierarchy}\rvert)$	0.128	0.127	0.081	0.044	0.000	0.078
$\ln(1+\lvert\Delta\text{ Individualism}\rvert)$	0.068	0.063	0.050	0.022	0.000	0.042
Transaction value × 1,000 ($billions)	0.002	0.000	0.008	0.002	0.000	0.007
Relative size	0.850	0.165	2.093	0.645	0.187	1.676
Acquirer market value × 1,000 ($ billions)	0.008	0.002	0.019	0.008	0.002	0.023
Majority cash	0.846	1.000	0.361	0.667	1.000	0.471
Tender offer	0.545	1.000	0.498	0.476	0.000	0.500
Friendly offer	0.903	1.000	0.296	0.917	1.000	0.277
Same industry	0.510	1.000	0.500	0.514	1.000	0.500
Acquirer termination fee	0.054	0.000	0.227	0.067	0.000	0.250

Table 2 (*continued*)

	Cross-border			Cross-border and matched domestic		
	Mean	Median	Standard deviation	Mean	Median	Standard deviation
Target termination fee	0.278	0.000	0.448	0.263	0.000	0.440
Target defense	0.033	0.000	0.178	0.044	0.000	0.205
Acquirer past return	0.700	0.158	12.001	0.277	0.150	1.873
Acquirer past volatility	0.033	0.021	0.204	0.031	0.022	0.133
Target past return	0.216	0.116	0.728	0.207	0.112	1.282
Target past volatility	0.036	0.030	0.064	0.038	0.031	0.051
ln(Acquirer country GDP)	20.920	20.988	1.281	21.188	21.070	1.308
ln(Target country GDP)	21.264	21.224	1.496	21.327	21.196	1.373
ln(Acquirer country openness)	0.056	0.050	0.049	0.053	0.051	0.039
ln(Target country openness)	0.062	0.054	0.040	0.056	0.053	0.036
ln(Acquirer country GDP/capita)	0.027	0.026	0.008	0.027	0.027	0.008
ln(Target country GDP/capita)	0.028	0.028	0.009	0.028	0.028	0.008
$\ln(1+\lvert\Delta$ Corporate tax rate$\rvert)$	0.072	0.068	0.050	0.024	0.000	0.045
Same religion	0.417	0.000	0.493	0.800	1.000	0.400
Same language	0.277	0.000	0.448	0.762	1.000	0.426
ln(Geographic distance)	8.000	8.683	1.233	6.674	6.950	1.479
Share border	0.222	0.000	0.416	0.727	1.000	0.446
Exchange rate volatility × 100	0.024	0.025	0.014	0.008	0.000	0.014
Exchange rate growth × 100	0.008	0.000	0.100	0.004	0.000	0.057
Same legal system	0.924	1.000	0.265	0.975	1.000	0.157
ln(Imports from acquirer country)	22.677	23.573	4.212	10.365	0.000	11.476
M&A private target fraction	0.167	0.070	0.253	0.130	0.087	0.164
M&A public target fraction	0.240	0.050	0.315	0.437	0.478	0.276

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3.4. Summary statistics

Table 2 presents summary statistics of the variables used in our analysis for both the full sample including the domestic benchmarks as well as the cross-border sample. Panel A presents country-level variables. The time-invariant country-level variables are absorbed by country fixed effects in our tests, but we present their summary statistics to reveal the wide diversity of countries in our sample. The average level of trust across all 783 country-year observations is 0.318, with a standard deviation of 0.159. The average levels of hierarchy and individualism are 0.477 and 0.528, both with standard deviations close to 0.11.

Roman Catholicism is the primary religion in 53% of country-years, followed by Protestantism at 17%, and Islam and Orthodox religions which comprise about 10% and 4% of the sample. The remaining fraction is made up of Buddhist, Church of Norway, Hindu, Shintoism, Taoism, and Zion Christian religions, not reported in the table. Across the sample countries, French Civil Law is the most common, followed by German Civil Law and English Common Law countries. Finally there is significant variation in GDP, GDP per capita, corporate tax rates, and openness over our sample countries.

Panel B of Table 2 presents summary statistics for country-pair variables. Across all cross-border country-pair-years, merger activity is very small. In fact, in untabulated results, we find that the 75th percentile of country-pairs have no mergers that meet our $1 million sample requirement. Clearly, cross-border mergers are not random, but instead highly focused within particular country-pairs as illustrated in Fig. 1. The average absolute difference between countries across all country pairs is 0.158 for trust, larger than the difference for hierarchy and individualism, each with an average of about 0.11. A shared religion is found in 29.1% of country-pairs, shared borders in 4.7%, and shared language in 3.4%.

Panel C of Table 2 reports summary statistics of deal-level characteristics for the 827 cross-border mergers and the 2,063 matched mergers in the public companies sub-sample. Comparing the summary statistics of the variables at the deal-level with the country-level further reveals that cross-border mergers are selected non-randomly from all country-pairs. For instance, the acquirer country and target country share the same religion in 42% of cross-border mergers, the same language in 28% of mergers, and the geographic distance between the countries is 2,981 km at the deal-level. This compares to 29%, 3.4%, and 4,885 km for all cross-border country-pairs in the sample. We discuss the effects of sample selection at the deal-level in more detail below.

We also find differences in announcement returns between the two samples. Across all of the cross-border deals in our sample, we find that the average combined cumulative abnormal return in the three-day window around the announcement is a positive 3.6% and 2.8% for matched cross-border and domestic mergers. In untabulated tests, we compare cross-border with domestic mergers directly, rather than between the cross-border and matched samples. First, we find that combined abnormal announcement gains are 2.52% in domestic mergers compared to 3.64% in cross-border mergers, a significant difference at the 0.017 level. This is consistent with the idea that conditional on winning the bid, cross-border mergers generate at least as much value as do

domestic mergers. This suggests that the value created by these deals more than offsets the value loss due to cross-border frictions. Second, we find no significant difference for acquirer gains in cross-border and domestic mergers (0.24% vs. 0.28%, p-value=0.872). Finally, we find slightly higher gains for targets in cross-border mergers than in domestic mergers (16.8% vs. 15.0%, p-value=0.018), consistent with greater overall gains. While these results show that overall gains are slightly higher in cross-border mergers, they do not identify the marginal effect of cultural distance, since many factors affect the overall gains. In later multivariate regressions, we analyze the marginal effect of cultural distance, controlling for other factors.

4. The effect of culture on the volume and gains of mergers

In this section we present empirical evidence on the role of cultural values on wealth creation in cross-border mergers. We analyze this in two ways. First, we investigate how culture affects the volume of mergers across countries. Like any transaction, mergers are expected to create value. This means that if mergers create more value on average, then we will observe greater merger volume. The advantage of this approach is that we are not restricted to mergers involving publicly traded firms. The disadvantage is that we cannot measure the magnitude of the effect of culture on firm values. Therefore, we also investigate the effect of culture on merger returns using the smaller sample of publicly traded firms.

4.1. The gravity model of the volume and gains in mergers

Following a long tradition in international economics, we use a 'gravity' model to generate an empirical estimating equation. Similar to Portes and Rey (2005), we wish to estimate the following for countries i and j in year t:

$$\begin{aligned}\ln(M\&A\ dollar\ volume_{ij,t}) &= \beta_1 \ln(Cultural\ distance_{ij})\\ &+\beta_2 \ln(Geographic\ distance_{ij})\\ &+\beta_3\ Other\ country\text{-}pair\ variables\\ &+\beta_4\ Time\text{-}varying\ country\text{-}level\ variables\\ &+Acquirer\ country\ dummies\&target\ country\ dummies\\ &+Time\ dummies+Constant+\varepsilon_{ij,t}. \qquad (1)\end{aligned}$$

$M\&A\ dollar\ volume_{ij,t}$ is the aggregate dollar value of all mergers worth at least $1 million where an acquirer is from country i and the target is from country j in year t. *Cultural distance* is the absolute difference between two countries for each of our three cultural values variables. We use logarithmic transformations following the gravity model, adding a one to a variable when necessary. We include both acquirer- and target-country fixed effects in all regressions. These dummy variables capture any country-level effects that do not vary over time, such as legal origin, investor protection laws, religion, and language. Country-level takeover regulations are also captured in the country fixed effects, as they do not vary substantially over time for most countries (Laing, Mobley, and Gómez, 2004). In addition, the country dummies account for any directional differences between the acquirer's and the target's countries. For instance, any effect that occurs because the acquirer's country has stronger governance laws than does the target's country is absorbed by our country dummies. Absolute differences, such as cultural distance and geographic distance, are not absorbed in these fixed effects.

We include year fixed effects to control for worldwide macro-economic shocks, such as currency crises and changes in world market valuations. We also include time-varying country-level variables, such as GDP, GDP/Capita, and imports and exports. We do not use country-pair dummies, since this would capture the cross-sectional effects of cultural differences between countries. Instead, we control for multiple country-pair variables such as geographic distance, shared language, religion, and institutions. We also double-cluster standard errors by the acquirer and target country to account for within-country time-series correlation. Since our underlying model of mergers proposes that mergers occur when the combined net benefits of the acquirer and target are positive, when net benefits are negative, we will not observe any mergers. Therefore, we estimate Tobit regression models to account for the truncation of observed merger activity at zero. Thus, we account for all time-invariant country-level effects, time effects, as well as a host of country-pair effects.

4.2. Merger volume results

Table 3 presents Tobit regression estimates of the effect of culture on the level of cross-border activity across the 27,753 directed country-pair-year observations. Columns 1–3 of Table 3 include the cultural values separately and column 4 includes all three, though each specification includes all the control variables. As predicted by the gravity model, cross-border mergers are more likely when countries are larger, share a common origin of their legal systems, a common religion, a common language, and are closer geographically.

Turning to the cultural variables, greater cross-country differences along the cultural dimensions of trustfulness and individualism are significantly related to less cross-border merger activity, even after including a multitude of controls. The large number of dummy variables in the Tobit regression could affect our estimates (Greene, 2004). Therefore, in column 5 we use an ordinary least squares (OLS) model to estimate the effect. In this model, greater distance in cultural values across all three dimensions reduces the number of cross-border mergers. Lower coefficient values reflect the truncation at zero. In column 6, we impose even stricter controls by including acquirer-country-year and target-country-year fixed effects to control for any effect at the country-year level. Our results hold in this specification, with significant and negative coefficients on each of the three cultural distance measures. Results in the online Appendix show that these findings are robust to measuring merger volume by numbers of mergers, rather than dollar volumes.

These negative effects of cultural distance have large economic consequences. For a change from the 25th to the 75th percentile in the natural log of distance in trust,

Table 3
Cultural distance and merger volume.

The dependent variable is the natural log of the aggregate dollar value of all mergers from acquirer country *i* to target country *j* in a panel from 1991 to 2008. Tobit regressions of a gravity model are run in columns 1–4 and OLS in 5 and 6. Trust is measured as whether people believe most other people can be trusted or not. Hierarchy is whether people believe they should follow instructions from a superior at work even if they do not agree vs. having to be convinced first. Individualism is whether people believe income differences are an incentive for effort vs. whether incomes should be made more equal. $|\Delta|$ indicates the absolute difference between the acquirer and target nation variables. All variables are defined in Appendix B. A constant is included in each specification but not reported in the table. Inclusion of fixed effects (FE) is indicated at the end. Significance at 10%, 5%, and 1%, indicated by *, **, and *** with *p*-values double-clustered at the acquirer and target country levels in parentheses.

	ln(1+Dollar volume of mergers)					
	Tobit (1)	Tobit (2)	Tobit (3)	Tobit (4)	OLS (5)	OLS (6)
ln(1+|Δ Trust|)	−2.681***			−2.573***	−0.902***	−0.901**
	(0.005)			(0.009)	(0.006)	(0.011)
ln(1+|Δ Hierarchy|)		−0.727		−0.490	−1.160***	−1.202***
		(0.498)		(0.649)	(<0.001)	(<0.001)
ln(1+|Δ Individualism|)			−3.096***	−2.916***	−0.748***	−0.678**
			(<0.001)	(0.001)	(0.002)	(0.012)
ln(Acquirer nation GDP)	2.286***	2.279***	2.185***	2.260***	0.366	
	(0.005)	(0.006)	(0.006)	(0.006)	(0.150)	
ln(Target nation GDP)	3.109***	3.136***	3.048***	3.079***	0.145	
	(0.002)	(0.001)	(0.002)	(0.002)	(0.525)	
ln(Acquirer openness)	4.282	3.519	4.123	4.745	0.369	
	(0.644)	(0.696)	(0.653)	(0.612)	(0.794)	
ln(Target openness)	2.239	1.813	2.622	2.864	0.019	
	(0.784)	(0.827)	(0.746)	(0.719)	(0.990)	
ln(Acquirer GDP/capita)	13.020	9.553	9.753	13.295	2.669	
	(0.622)	(0.724)	(0.715)	(0.612)	(0.656)	
ln(Target GDP/capita)	−70.382**	−71.642**	−72.283**	−70.824**	2.413	
	(0.027)	(0.024)	(0.022)	(0.024)	(0.729)	
ln(1+|Δ Corporate tax rate|)	−5.025**	−5.197**	−4.955**	−4.703**	−1.066	−0.866
	(0.013)	(0.013)	(0.018)	(0.020)	(0.137)	(0.237)
Same religion	0.811***	0.817***	0.790***	0.761***	0.269***	0.251***
	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(0.001)	(0.003)
Same language	1.025***	1.106***	1.054***	0.947***	0.807***	0.663***
	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(0.002)
ln(Geographic distance)	−1.624***	−1.639***	−1.626***	−1.602***	−0.374***	−0.395***
	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)
Share border	0.727***	0.779***	0.761***	0.706***	0.871***	0.802***
	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)
Exchange rate volatility	0.125***	0.120***	0.123***	0.128***	0.035***	0.001
	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(0.917)
Exchange rate growth	0.013***	0.013***	0.014***	0.013***	0.001	0.000
	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(0.134)	(0.986)
Double-tax treaty	0.609***	0.629***	0.626***	0.602***	−0.127***	−0.120**
	(0.001)	(0.001)	(<0.001)	(0.001)	(0.008)	(0.017)
Bilateral investment treaty	−0.172	−0.219	−0.212	−0.181	−0.286***	−0.328***
	(0.363)	(0.268)	(0.277)	(0.329)	(0.009)	(0.004)
Same legal system	0.781***	1.168***	1.183***	0.829***	0.401***	0.417***
	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)
ln(Imports from acquirer nation)	−0.019***	−0.022***	−0.018**	−0.014*	−0.033***	−0.063***
	(0.008)	(0.007)	(0.021)	(0.053)	(<0.001)	(<0.001)
Private mergers	5.015***	5.035***	5.028***	5.008***	2.236***	2.191***
	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)
Public mergers	6.381***	6.392***	6.390***	6.370***	4.601***	4.516***
	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)
Acquirer country fixed effects	Yes	Yes	Yes	Yes	Yes	No
Target country fixed effects	Yes	Yes	Yes	Yes	Yes	No
Year fixed effects	Yes	Yes	Yes	Yes	Yes	No

Table 3 (*continued*)

	ln(1+Dollar volume of mergers)					
	Tobit (1)	Tobit (2)	Tobit (3)	Tobit (4)	OLS (5)	OLS (6)
Acquirer country-year fixed effects	No	No	No	No	No	Yes
Target country-year fixed effects	No	No	No	No	No	Yes
Log likelihood	−19,811	−19,835	−19,821	−19,794		
Constant only log likelihood	−27,629	−27,629	−27,629	−27,629		
Adjusted R^2					0.521	0.529
Observations	27,753	27,753	27,753	27,753	27,753	27,753

the natural log of the dollar value of mergers across all country-pair years falls by 0.436. For the same change in the distance of individualism, merger activity falls by 0.334. These are large effects, given the average of the natural log of dollars in cross-border mergers is 1.02. They are also comparable to the extreme change in log merger activity between countries that share the same religion (0.761) or same legal system (0.829) versus countries that do not.

These results provide strong evidence that cultural differences have a substantial negative effect on the volume of cross-border mergers, consistent with the hypothesis that cultural distance imposes additional costs in cross-border mergers. However, one could be concerned that reverse-causation leads countries to share cultural values following a large number of cross-border mergers. In addition, cultural values could proxy for omitted institutional features of a country. For instance, residents of countries with a history of fair and orderly government could be more trustful and hierarchical. Thus, differences in country-level institutions could jointly determine both cultural differences and merger volumes.

To address these issues, following Guiso, Sapienza, and Zingales (2009), we use genetic and somatic differences to instrument for cultural differences in generalized methods of moments (GMM) estimations. We use F_{ST} distance, which measures the probability that two random alleles (DNA variations) from two populations will be different (CavalliSforza, Menozzi, and Piazza, 1994; Spolaore and Wacziarg, 2009). To measure somatic difference, we use data originally collected in Biasutti (1954) on height, hair color, and cephalic index (dimensions of the head) for European countries, made available by Guiso, Sapienza, and Zingales (2009).

Panel A of Table 4 presents estimates using genetic distance to proxy for cultural difference. All of the controls are identical to those used in Table 3. Using genetic differences as a proxy, we find that differences in trustfulness, hierarchy, and individualism are all negatively and significantly related to merger volume. In Panel B, with a constrained sample from the limited data on somatic distance, the difference in trust is still negatively related to cross-border merger activity, though the other two variables are insignificant. This could reflect the small sample size available. The first-stage regression results are reported in the online Appendix. These results provide assurance that our main findings are not driven by reverse-causation or omitted variables. In addition, these results support the notion that cultural values lead to legal institutions, rather than vice versa, consistent with Licht, Goldschmidt, and Schwartz (2007), Tabellini (2008), and Gorodnichenko and Roland (2010).

4.3. Merger gains results

In this section, we apply the gravity model to tests of the combined gains in cross-border mergers. We first discuss how we address selection bias in these tests.

4.3.1. Selection bias

We have established in the prior section that there is a selection effect on cultural differences in cross-border mergers. Mergers are not randomly assigned, but rather only mergers with expected positive gains are undertaken. To address this selection bias in tests of merger outcomes, we need to account for the likelihood that two firms merge. We do this by running a two-stage Heckman model. We first run a probit analysis using the same variables as in column 4 of Table 3, where the dependent variable is equal to one if two countries had any cross-border mergers in each year, and zero otherwise. For each country-pair, we calculate the predicted probability of a cross-border merger from the fitted values of the probit model. Then, at the deal-level, we use this country-pair predicted probability to calculate an inverse Mill's ratio to proxy for the likelihood of a merger, which is indicated in the regression results as 'Heckman's lambda.'

We use double-taxation treaties and bilateral investment treaties as instruments for the likelihood of cross-country mergers. From the results reported in Table 3, we find that these treaties are significantly related to cross-country mergers. However, these treaties are often signed for political reasons and are less likely to affect the gains that a merger creates. Instead, they act as gateways to inhibit the incidence of mergers, but are unlikely to have a direct effect on the value of the mergers. Therefore, we exclude these instruments in our deal-level tests. We also use the difference in corporate tax rates as another possible instrument and find that our results are qualitatively unchanged.

We also provide robustness checks by using selection bias correction methods that account for the unequal incidence of cross-border mergers, where most country-pairs have no cross-border mergers (failures) and very few have many (successes). King and Zeng (2001) show that binary choice models are prone to underestimate the probability of a successful outcome in such distributions. In our sample, 80% of country pairs have no cross-border

Table 4
GMM instrumental variables regression of culture on merger volume.

The dependent variable is the natural log of the aggregate dollar value of all mergers from acquirer country *i* to target country *j* in a panel from 1991 to 2008. Generalized methods of moments (GMM) regression coefficients are reported where the excluded instrument in Panel A is $\ln(F_{st})$, a measure of genetic difference for the majority population in a country (CavalliSforza, Menozzi, and Piazza, 1994), and in Panel B is ln(Somatic distance), a measure of somatic distance based on height, hair color (pigmentation), and cephalic index (Biasutti, 1954). 'Controls' indicate that all the control variables used in Table 3 are included. $|\Delta|$ indicates the absolute difference between the acquirer and target nation variables. All variables are defined in Appendix B. First-stage estimates are available in the online Appendix. Tests of under-identification and weak instruments based on Kleibergen and Paap (2006). Significance at 10%, 5%, and 1%, indicated by *, **, and *** with *p*-values clustered at the acquirer-target country-pair level in parentheses.

	ln(1+Dollar volume of mergers)		
	(1)	(2)	(3)
Panel A: Cultural distance instrumented by genetic distance			
ln(1+|Δ Trust|)	−19.429***		
	(0.001)		
ln(1+|Δ Hierarchy|)		−30.294***	
		(0.001)	
ln(1+|Δ Individualism|)			−44.674**
			(0.013)
Controls	Yes	Yes	Yes
Acquirer country fixed effects	Yes	Yes	Yes
Target country fixed effects	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes
Test of under-identification	13.805	12.654	7.059
	(<0.001)	(<0.001)	(0.008)
Test of weak instruments	13.903	12.668	6.934
Observations	27,753	27,753	27,753
Panel B: Cultural distance instrumented by somatic distance			
ln(1+|Δ Trust|)	−2.278*		
	(0.074)		
ln(1+|Δ Hierarchy|)		64.703	
		(0.442)	
ln(1+|Δ Individualism|)			−20.840
			(0.190)
Controls	Yes	Yes	Yes
Acquirer country fixed effects	Yes	Yes	Yes
Target country fixed effects	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes
Test of under-identification	20.457	0.859	2.572
	(<0.001)	(0.354)	(0.109)
Test of weak instruments	46.184	0.834	2.674
Observations	2,844	2,844	2,844

mergers. Though this is not an extreme distribution, for robustness, we follow the rare events literature and randomly drop observations where no cross-border mergers occurred to generate a balanced sample of successes and failures and then use the correction to the coefficients proposed by King and Zeng (2001). Because the logistic regression is better behaved in such a circumstance, we use a logit test in the first stage, rather than a probit, and then calculate selection variables using both of the logit-based methods of Lee (1983) and Dubin and McFadden (1984). Our results are virtually unchanged using these other methods. The results are presented in the online Appendix. Though our attempts to correct for selection bias are unlikely to be completely successful, we feel that our attempts are a substantial improvement over the vast majority of existing research on mergers which makes no effort to correct for selection bias at all.

4.3.2. Cultural differences and abnormal returns

Table 5 presents coefficient estimates of the effect of cultural differences on combined returns in cross-border mergers where we include the same controls as before including country-level fixed effects, but also deal-level characteristics known to affect announcement returns. We include each measure of culture separately in columns 1–3 and then all together in column 4, including only cross-border mergers in the sample. Consistent with prior studies, other variables affect cross-border merger returns in predictable ways. These include the positive effects of the target's relative size to the acquirer, using cash as payment, and the use of a tender offer.

Turning to our hypothesis, we find that the greater is the distance between two countries along the cultural dimensions of trust and individualism, the lower are the combined announcement returns of a merger. This effect is consistent with the results found for the role of trust and individualism on the volume of cross-border mergers. In column 5 we include the benchmark matched domestic mergers and find that our results hold, with trust remaining negative and significant and hierarchy now significantly negative and individualism insignificant.

Table 5
Cultural distance and combined abnormal returns.

Dependent variable is the combined abnormal announcement return of the target and acquirer over $(-1,+1)$ days, weighted by market values, over 1991–2008. OLS estimates are presented, where columns 1–4 only include cross-border deals and column 5 includes up to two matched domestic deals based on acquirer and target country-industry-size-year for each cross-border deal. $|\Delta|$ indicates absolute difference between acquirer and target nation variables. 'Heckman's lambda' is a self-selection variable. All variables defined in Appendix B. A constant is included in each specification but not reported in the table. Significance at 10%, 5%, and 1%, indicated by *, **, and *** with *p*-values double-clustered at the acquirer and target country levels in parentheses.

	Combined $CAR_{(-1,+1)}$				
	Cross-border				Cross-border and matched domestic
	(1)	(2)	(3)	(4)	(5)
ln(1+|Δ Trust|)	−0.059***			−0.050*	−0.046*
	(0.007)			(0.081)	(0.086)
ln(1+|Δ Hierarchy|)		0.013		0.022	−0.042***
		(0.881)		(0.802)	(<0.001)
ln(1+|Δ Individualism|)			−0.081**	−0.066*	−0.042
			(0.031)	(0.098)	(0.481)
Transaction value	0.130	0.117	0.114	0.113	0.147
	(0.705)	(0.764)	(0.741)	(0.758)	(0.520)
Relative size	0.011***	0.011***	0.011***	0.011***	0.007***
	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)
Acquirer market value	−0.599	−0.593	−0.593	−0.598	−0.296***
	(0.105)	(0.107)	(0.106)	(0.106)	(<0.001)
Majority cash	0.017**	0.018**	0.018**	0.017**	0.019***
	(0.021)	(0.016)	(0.013)	(0.024)	(0.002)
Tender offer	0.009**	0.009**	0.009**	0.009**	0.009
	(0.027)	(0.020)	(0.020)	(0.023)	(0.195)
Friendly offer	0.003	0.003	0.003	0.003	0.001
	(0.745)	(0.758)	(0.769)	(0.751)	(0.927)
Same industry	−0.006	−0.005	−0.005	−0.006	−0.007
	(0.312)	(0.358)	(0.339)	(0.312)	(0.134)
Acquirer termination fee	−0.006	−0.006	−0.006	−0.006	0.000
	(0.479)	(0.482)	(0.479)	(0.463)	(0.319)
Target termination fee	−0.003	−0.003	−0.002	−0.003	−0.001
	(0.692)	(0.759)	(0.803)	(0.737)	(0.929)
Target defense	0.002	0.001	0.001	0.002	0.005
	(0.825)	(0.898)	(0.855)	(0.796)	(0.344)
Acquirer past return	0.000	0.000	0.000	0.000	0.007***
	(0.288)	(0.221)	(0.263)	(0.256)	(0.003)
Acquirer past volatility	−0.010***	−0.010***	−0.009***	−0.009***	−0.076***
	(0.002)	(0.004)	(0.003)	(0.007)	(0.002)
Target past return	−0.008**	−0.009**	−0.009**	−0.008**	−0.009***
	(0.033)	(0.034)	(0.030)	(0.032)	(<0.001)
Target past volatility	0.029	0.030	0.030	0.030	0.090***
	(0.121)	(0.122)	(0.102)	(0.107)	(0.003)
ln(Acquirer country GDP)	0.268***	0.272***	0.265***	0.267***	0.259***
	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(0.004)
ln(Target country GDP)	0.023	0.017	0.010	0.017	−0.014
	(0.689)	(0.774)	(0.860)	(0.769)	(0.900)
ln(Acquirer openness)	0.314	0.195	0.261	0.395	0.957
	(0.671)	(0.809)	(0.714)	(0.612)	(0.161)
ln(Target openness)	1.151	1.126	1.082	1.160	0.006
	(0.160)	(0.152)	(0.166)	(0.135)	(0.992)
ln(Acquirer country GDP/capita)	−7.951**	−7.863**	−7.800***	−7.951**	−9.381***
	(0.011)	(0.012)	(0.010)	(0.011)	(0.009)
ln(Target country GDP/capita)	2.638*	2.256	2.197*	2.507*	5.623*
	(0.076)	(0.131)	(0.099)	(0.057)	(0.076)
ln(1+|Δ Corporate tax rate|)	−0.050	−0.039	−0.038	−0.048	−0.052
	(0.633)	(0.709)	(0.708)	(0.641)	(0.247)
Same religion	−0.001	−0.002	−0.002	0.000	−0.006
	(0.835)	(0.812)	(0.828)	(0.988)	(0.323)
Same language	−0.004	−0.003	−0.006	−0.006	0.017***
	(0.802)	(0.826)	(0.695)	(0.691)	(0.007)
ln(Geographic distance)	−0.006	−0.007	−0.007	−0.007	−0.004
	(0.243)	(0.347)	(0.193)	(0.315)	(0.180)
Share border	0.016**	0.016**	0.014**	0.016**	−0.001
	(0.015)	(0.014)	(0.026)	(0.017)	(0.883)
Exchange rate volatility	24.435	23.449	20.373	20.385	45.109***

Table 5 (*continued*)

	Combined $CAR_{(-1,+1)}$				
	Cross-border				Cross-border and matched domestic
	(1)	(2)	(3)	(4)	(5)
	(0.363)	(0.381)	(0.463)	(0.466)	(< 0.001)
Exchange rate growth	3.441**	3.512**	3.558**	3.539**	6.284***
	(0.045)	(0.042)	(0.048)	(0.042)	(< 0.001)
Same legal system	−0.010	−0.002	0.001	−0.007	0.000
	(0.308)	(0.860)	(0.917)	(0.550)	(0.993)
ln(Imports from acq. nation)	−0.002**	−0.002**	−0.002**	−0.002**	0.001*
	(0.026)	(0.014)	(0.025)	(0.015)	(0.051)
Private mergers	−0.013**	−0.013**	−0.013**	−0.013**	−0.013
	(0.025)	(0.028)	(0.032)	(0.023)	(0.367)
Public mergers	0.002	0.000	0.000	0.001	−0.007
	(0.889)	(0.989)	(0.967)	(0.898)	(0.567)
Heckman's lambda	0.002	−0.001	0.000	0.003	−0.010
	(0.895)	(0.972)	(0.978)	(0.889)	(0.358)
Acquirer country fixed effects	Yes	Yes	Yes	Yes	Yes
Target country fixed effects	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes
Adjusted R^2	0.158	0.156	0.158	0.156	0.156
Observations	827	827	827	827	2,063

These effects are also economically significant. Increasing the distance in trustfulness from the 25th percentile to the 75th percentile leads to a 28% reduction from the median combined return of 2.1%, and a 16% reduction of the average combined return of 3.6%. For the same change in individualism, there is an equal drop in abnormal returns. In dollar terms, this implies a range of value loss for median-size firms of roughly $12 million to $14.6 million. For average-size firms, the loss is roughly $47–$57 million.

4.4. Summary of the effect of culture on the volume and gains of mergers

Our empirical evidence provides strong support for the hypothesis that cultural values impact both cross-border merger activity and wealth creation. We find that higher levels of cross-border merger activity are explained in part by less cultural differences between two countries along all three of the most cited dimensions of cultural identity: trust, hierarchy, and individualism. Likewise, greater cross-country similarity of cultural values increases the combined gains in cross-border mergers. These results hold in instrumental variables tests that control for endogeneity, reverse-causality, and selection bias. These findings are consistent with the hypothesis that cultural distance impedes mergers by introducing costly frictions, and contrary to the ideas that cultural diversity increases firm efficiency and also that cultural differences have no impact on mergers. Taken together, these results intuitively fit into a rational trade off between the costs and benefits of mergers.

5. Robustness checks

In this section of the paper, we describe various robustness checks to ensure our results are not driven by U.S. firms, nor our measures of national culture, nor that our effects are driven by differences in the cultural values of investors, rather than firms.

5.1. Regional culture differences within the U.S.

As discussed previously, it is important to separately identify the effect of national cultural differences on cross-border merger activity from the effect of legal and political institutional differences. We addressed this concern in our main tests by controlling for a multitude of institutional details and country-fixed effects, and in Table 4 by using instrumental variables. In this section, we present an additional robustness check to verify that our results are based on cultural differences, not institutional differences.

To control for institutional effects on mergers, we rerun our tests using only U.S. domestic mergers, but account for cultural differences between 10 Census geographic regions in the U.S., as recorded by the World Values Survey. Thus, we investigate the effect of cross-regional cultural differences (between New England and the South-East, for example) on the incidence of cross-regional mergers. The benefit of this setting is that the institutional environment is nearly identical for all of the regions, though cultural values are not. The difficulty with this setting is that interregional cultural differences are smaller than are cross-country cultural differences, which makes finding statistically significant relations less likely.

The results are presented in Table 6. We find evidence consistent with our hypothesis in the cross-regional tests. Controlling for region-level fixed effects, region GDP and GDP/capita, and geographic distance, as in the main tests, we find a significant negative effect of cultural differences on the volume of cross-regional mergers for all three of the dimensions of cultural values, though individualism is not significant in the OLS regressions. These results provide further evidence that cultural differences are not simply

Table 6
Cultural distance and merger volume between U.S. regions.

The dependent variable is the natural log of the aggregate dollar value of all mergers from acquirer region *i* to target region *j* in a panel from 1991 to 2008 for U.S. firms only. Tobit regressions of a gravity model are run in columns 1–4 and OLS in 5 and 6. Trust is measured as whether people believe most other people can be trusted or not. Hierarchy is whether people believe they should follow instructions from a superior at work even if they do not agree vs. having to be convinced first. Individualism is whether people believe income differences are an incentive for effort vs. whether incomes should be made more equal. $|\Delta|$ indicates the absolute difference between the acquirer and target nation variables. All variables are defined in Appendix B. A constant is included in each specification but not reported in the table. Inclusion of fixed effects (FE) is indicated at the end. Significance at 10%, 5%, and 1%, indicated by *, **, and *** with *p*-values double-clustered at the acquirer and target country levels in parentheses.

	ln(1+Dollar volume of mergers)					
	Tobit (1)	Tobit (2)	Tobit (3)	Tobit (4)	OLS (5)	OLS (6)
ln(1+|Δ Trust|)	−9.058***			−6.801***	−6.425***	−6.425***
	(<0.001)			(<0.001)	(<0.001)	(<0.001)
ln(1+|Δ Hierarchy|)		−11.878***		−6.623***	−6.186***	−6.186**
		(<0.001)		(0.007)	(0.009)	(0.017)
ln(1+|Δ Individualism|)			−10.770***	−1.635	−0.829	−0.829
			(0.010)	(0.587)	(0.685)	(0.712)
ln(Geographic distance)	−0.279***	−0.292***	−0.329***	−0.257***	−0.258***	−0.258***
	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)
Share border	0.637***	0.513***	0.523***	0.599***	0.569***	0.569***
	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)
ln(Target region GDP/capita)	2.383	2.383	2.388	2.381	2.484	
	(0.410)	(0.410)	(0.409)	(0.411)	(0.376)	
ln(Target region GDP)	0.611	0.613	0.612	0.612	0.680	
	(0.739)	(0.738)	(0.739)	(0.739)	(0.704)	
ln(Acquirer region GDP/capita)	−1.566	−1.567	−1.561	−1.571	−1.448	
	(0.160)	(0.161)	(0.164)	(0.158)	(0.199)	
ln(Acquirer region GDP)	3.837***	3.837***	3.838***	3.837***	3.780***	
	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	
Acquirer region fixed effects	Yes	Yes	Yes	Yes	Yes	No
Target region fixed effects	Yes	Yes	Yes	Yes	Yes	No
Year fixed effects	Yes	Yes	Yes	Yes	Yes	No
Acquirer region-year fixed effects	No	No	No	No	No	Yes
Target region-year fixed effects	No	No	No	No	No	Yes
Log likelihood	−4,380	−4,386	−4,404	−4,372		
Constant only log likelihood	−5,569	−5,569	−5,569	−5,569		
Adjusted R^2					0.636	0.645
Observations	2,400	2,400	2,400	2,400	2,400	2,400

proxies for institutional differences in regulations, governance, currency exchange, or any other aspect of cross-border political, legal, or economic differences.

5.2. Excluding U.S. firms

Because U.S. firms account for a large fraction of our sample, we verify that our cross-country results do not change if we exclude these firms from our analyses. Since our measures of merger activity are at the country-year level, our sample size is only reduced slightly by this exclusion. We find that the results on merger volume are unchanged across all three dimensions. Excluding U.S. firms as either targets or acquirers reduces our sample of public acquisitions from 827 to 405. However, the results on combined returns are unchanged and actually show a larger and more significant effect of cultural differences. Overall, the robustness tests indicate that our results are not driven by U.S. firms. These results are available in the online Appendix.

5.3. Alternative cultural measures

Measures of cultural values other than the World Values Survey have been used in prior literature. Hofstede (1980, 2001) categorizes culture into five dimensions: uncertainty avoidance (the extent to which a society feels threatened by uncertainty), masculinity (the extent to which a society holds values traditionally identified as masculine: assertiveness, materialism, and not caring for others), power distance (similar to our hierarchical classifications), individualism (as we categorize it as well), and short-term versus long-term orientation. Hofstede measured national culture along these five dimensions using survey responses from over 88,000 employees of IBM in 40 countries in 20 languages in the 1960s and 1970s. See Kirkman, Lowe, and Gibson (2006) for a comprehensive survey of research using Hofstede's measures.

Alternatively, Schwartz (1994) defines three dimensions of cultural values: Embeddedness versus Autonomy (similar to our individualism dimension), Hierarchy versus Egalitarianism (same as our Hierarchy dimension), and Mastery versus Harmony (where Mastery is an

emphasis on dominating an environment through assertion and harmony refers to finding one's place in an existing environment). Schwartz's data come from survey responses of more than 25,000 elementary school teachers and university students in 44 countries.

We use the World Values Survey to measure culture because it provides the broadest and most up-to-date information on cultural values and because the WVS allows us to measure the two cultural values that overlap with both the Hofstede and Schwartz measures: hierarchy and individualism, as well as the question used to measure trust in prior research. However, for robustness, we study the effects of cultural value measures from Schwartz (1994) and Hofstede (2001). We find strong negative relations between the Hofstede measures and the volume of cross-border mergers. For the Schwartz measures, we find that the effect of egalitarianism on merger volume is negative and significant, though the other dimensions are insignificant. It is reasonable that in some cases there will be lower significance levels or weaker results given the wide differences in sampling methods, sample sizes, and the exact questions asked. These results are available in the online Appendix.

5.4. Long-run effects

One could argue that the empirical relationship between national culture and mergers reflects that investors in different countries respond differently to mergers, rather than reflecting the ease of transactions or costly post-merger integration. Our first response to this criticism is that only part of our results are driven by initial investor reactions, whereas the volume of mergers is not based on market responses. Despite the well-known problems of identifying long-run stock market performance (Lyon, Barber, and Tsai, 1999; Mitchell and Stafford, 2000), to address the concern for the set of results based on acquirer announcement returns, we investigate long-run stock returns using a buy-and-hold approach. Using country-level market equity, book-to-market, and momentum benchmarks, as well as an analogous world benchmark, we find no consistent significant effects of national culture on long-run acquirer stock returns. This is consistent with market efficiency, where the value effects are captured at the announcement and no momentum or reversals are observed, on average. These additional tests provide some assurance that our results on combined merger gains are not driven simply by cultural differences in stock market investors.

6. Conclusion

This paper investigates the role of national cultural values on the pattern of cross-border merger activity and the gains they create. In a comprehensive sample of 20,893 cross-border mergers from 52 different countries over 1991–2008, we find that culture has a significant and economically meaningful effect on the volume of cross-border mergers. Controlling for country-level fixed-effects as well as a multitude of country-pair variables including shared legal origin, language, religion, geographic distance and more, we find a strong negative relationship between cultural distance and the volume of cross-border merger activity between two countries. In particular, the greater is the cross-country difference between the values of trust, hierarchy, and individualism, the smaller is the cross-border merger volume. Similarly, less cultural distance leads to higher combined announcement returns in cross-border mergers. This is consistent with the hypothesis that cultural differences impose costly frictions between firms which lead to fewer mergers.

This paper is part of a growing field of research that connects finance with sociology. Our findings show that culture matters, even when the financial stakes are very large. These results and others in this literature question many of the assumptions that are made in classical economics and highlight the need for new theories that can account for behavior that does not follow that of the so-called 'Economic Man.'

Appendix A

This appendix presents a simple model of the effect of cultural distance on mergers. Consider a domestic bidder (D) and a cross-border bidder (CB) competing for the same target. They both draw a signal X of synergies S from a uniform distribution on [0, 1]. The cross-border bidder bears additional integration costs $0<C<1$. The cross-border bidder will only win the acquisition when $E[S|X_{cb}]-C > E[S|X_d]$. For simplicity, assume that expected synergies S equal the signal X: $E[S|X]=X$. Adding additional random noise would not change the results. Therefore, the cross-border bidder will acquire the target only if $X_{cb}-C>X_d$, or $X_{cb}-X_d>C$.

The difference between two uniform distributions is a triangular distribution $T[-1,1]$, centered at zero with support $[-1, 1]$. Therefore, the cumulative distribution function of $X_{cb}-X_d$ is

$$F(z)=\begin{cases}\dfrac{(1+z)^2}{2} & \text{for } z<0,\\ 1-\dfrac{(1-z)^2}{2} & \text{for } z>0.\end{cases}$$

This means that the probability that the cross-border bidder wins is

$$\begin{aligned}&\Pr(\text{Cross-border bidder wins})=\Pr(X_{cb}-X_d>C)\\ &=1-F(C)=1-\left(1-\frac{(1-C)^2}{2}\right)=\frac{(1-C)^2}{2}.\end{aligned}\tag{2}$$

As the cultural distance costs C increase, the probability that the cross-border bidder wins decreases, but as long as C is not too high, there is a positive probability that the cross-border bidder will win.

We next compute the expected synergy gains of the cross-border bidder, net of costs C, conditional on the cross-border bidder winning the deal. We first need to compute the conditional expectation $E[E[X_{cb}|X_{cb}>X_d+C]]$. This is the expected value of the signal given that the cross-border bidder's signal minus the cultural costs is greater than the domestic bidder's signal.

$$E[E[X_{cb}|X_{cb}>X_d+C]]=\iint x_{cb}\cdot f(x_{cb}|x_{cb}>x_d+C)\cdot dx_{cb}\,dx_d.$$

The probability density function (pdf) $f(x_{cb}|x_{cb} > x_d + C)$ is the uniform distribution over the triangular region of the joint distribution of X_{cb} and X_d, where $x_d + C < x_{cb} < 1$ and $0 < x_d < 1-C$. Because the distribution is uniform, the pdf is the inverse of the area of the support:

$$
\begin{aligned}
E[E[X_{cb}|X_{cb} > X_d + C]] &= \int_0^{1-C} \int_{x_d+C}^{1} x_{cb} \cdot \frac{2}{(1-C)^2} \cdot dx_{cb}\, dx_d \\
&= \frac{2}{(1-C)^2} \int_0^{1-C} \left[\frac{x_{cb}^2}{2}\right]_{x_d+C}^{1} dx_d \\
&= \frac{1}{(1-C)^2} \int_0^{1-C} 1-(x_d+C)^2\, dx_d \\
&= \frac{1}{(1-C)^2} \left[x_d - \frac{(x_d+C)^3}{3}\right]_0^{1-C} \\
&= \frac{1}{(1-C)^2} \left[1-C-\frac{1}{3}+\frac{C^3}{3}\right] \\
&= \frac{2-3C+C^3}{3(1-C)^2} = \frac{2+C-4C+C^3}{3(1-C)^2} \\
&= \frac{2+C+C(C^2-4)}{3(1-C)^2} \\
&= \frac{(2+C)+C(C+2)(C-2)}{3(1-C)^2} \\
&= \frac{(2+C)(1-2C+C^2)}{3(1-C)^2} = \frac{2+C}{3}.
\end{aligned}
$$

The conditional expectation represents the average signal of cross-border bidders, conditioning on winning the deal. The signal ranges from 2/3, when C is equal to zero, to 1, when C is equal to one. When cultural distance costs are higher, the cross-border bidder's realization of the random signal must be higher for it to outbid the domestic bidder.

With this conditional expectation, we solve for the expected synergy gains of the cross-border bidder, conditional on the cross-border bidder winning, and net of any costs C.

$$
\begin{aligned}
&E[\text{Value net of costs}|\text{Cross-border wins}] \\
&= E[E[X_{cb}|X_{cb} - C > X_d]] - C = \left[\frac{2+C}{3}\right] - C = \frac{2}{3}(1-C). \qquad (3)
\end{aligned}
$$

Conditional on the cross-border bidder winning the deal, similar calculations show that the domestic bidder's value is $\frac{1}{3}(1-C)$, lower than the cross-border bidder's value, as must be the case. Because the cross-border bidder received a random signal that was high enough to overcome the domestic bidder's signal, even after accounting for the cultural distance costs, it wins the bid and has a positive gain. At the same time, the derivative of the value gains with respect to the cultural distance cost C is $-\frac{2}{3} < 0$. This means that though the cross-border bidder wins, the marginal effect of cultural distance is negative. In the case of the domestic bidder winning, we find analogous results: the domestic bidder's net gains are higher, but the marginal costs of the cross-border bidder's cultural distance are still negative. We do not provide these equations for brevity, but they follow from the analysis presented above.

To summarize, this simple model illustrates three points:

1. The likelihood of a cross-border merger decreases as cultural distance costs increase.
2. Conditional on the cross-border bidder winning the acquisition, the value created by the cross-border bidder net of costs is greater than the value created by the domestic bidder.
3. Cultural distance costs C have a negative effect on the value created in mergers.

Appendix B

All cash: Dummy variable equal to one if the payment in the merger is made with all cash (Source: SDC).

Bilateral investment treaty: Dummy variable equal to one if the acquirer and target nation signed a bilateral investment treaty (Source: UNCTAD).

Combined $CAR_{(-1,+1)}$: The weighted cumulative abnormal return in the three days surrounding the merger announcement of the acquirer and target firm, where firm weights are based on market values two days before the announcement. Cumulative abnormal returns are calculated as the sum of the firm's raw return minus the Datastream country index of the firm's host country over the three days (Source: Authors' calculations).

Corporate tax rate: Country corporate tax rate percentage in 2008 (Source: Economic Freedom Index 2009).

Country pair merger count: Aggregate number of all mergers from acquirer country i to target country j in a panel from 1991 to 2008 (Source: SDC).

Country pair merger value: Aggregate dollar value of all mergers from acquirer country i to target country j in a panel from 1991 to 2008 (Source: SDC).

Days to completion: Number of days between the announcement and the completion of the merger (Source: SDC and authors' calculations).

Double-tax treaty: Dummy variable equal to one if the acquirer and target nation signed a double-taxation treaty (Source: UNCTAD).

Exchange rate growth: Exchange rate growth one year prior to the announcement between the acquirer and target nation (Source: Institutional Brokers' Estimate System (I/B/E/S) database).

Exchange rate volatility: Exchange rate standard deviation from 36 months up to one month prior to the announcement, between the acquirer and target nation (Source: I/B/E/S database).

Financial acquirer: Dummy variable equal to one if SDC reports the acquirer as a financial acquirer (Source: SDC).

Friendly offer: Dummy value equal to one if a merger attitude is classified as friendly (Source: SDC).

GDP per capita: Annual Gross Domestic Product per capita (Source: Penn World Table 6.3).

Genetic distance: F_{ST} distance, a measure of the probability that two random alleles (DNA variations) from two populations will be different, based on the dominant population of a country (Source: CavalliSforza, Menozzi, and Piazza, 1994; and online Appendix of Spolaore and Wacziarg, 2009).

Geographic distance: Geographic distance between capitals. The geographical distances are calculated following the great circle formula, which uses latitudes and longitudes of the most important city (in terms of population) or of its official capital (Source: CEPII).

Hierarchy: Average answer to the following question: "People have different ideas about following instructions at work. Some say that one should follow one's superior's instructions even when one does not fully agree with them. Others say that one should follow one's superior's instructions only when one is convinced that they are right. With which of these two opinions do you agree? (1) Should follow instructions (2) Must be convinced first (3) Depends" (Question V105) (Source: World Values Survey).

Imports from acquirer nation: Ratio between the dollar volume of all trade flow each year (excluding re-exports and re-imports) from acquirer country *i* to target country *j* and the total imports of target country *j* (Source: UN COMTRADE).

Individualism: Average answer to the following question: "Incomes should be more equal or We need larger income differences as incentives for individual effort" (Question V141) (Source: World Values Survey).

Language: Primary spoken language of a country (Source: CIA World Factbook 2008).

Legal system: Common or civil law origin countries, with the latter further classified as French, German, or Scandinavian (Source: La Porta, Lopez-de-Silanes, Shleifer, and Vishny, 1998).

Majority cash: Dummy variable equal to one if the merger payment is made with at least 50% cash (Source: SDC).

Market value: The value of equity 10 days before the merger announcement (Source: Compustat Global).

Merger of equals: Dummy variable equal to one if the merger is recorded by SDC as a merger of equals (Source: SDC).

Openness: Exports plus Imports divided by GDP as a percentage of GDP. The export and import figures are in national currencies from the World Bank and United Nations data archives (Source: Penn World Tables 6.3).

Past year return: Stock buy-and-hold return in the 12 months prior to the announcement month (Source: Compustat Global and CRSP).

Past year return volatility: Stock return volatility in the 12 months prior to the announcement (Source: Compustat Global and CRSP).

Premium: The transaction value reported by SDC divided by the market value of the target 30 days before the announcement (Source: SDC, Compustat Global, and CRSP).

Private mergers: Ratio between the dollar volume of all mergers in which the target is private and the total dollar volume of all mergers for each country-pair and year (Source: SDC).

Public mergers: Ratio between the dollar volume of all mergers in which the target is public and the total dollar volume of all mergers for each country-pair and year (Source: SDC).

Relative size: The ratio of the transaction value to the target market value at the announcement date (Source: SDC).

Religion: The primary religion in a country (Source: CIA World Factbook 2008).

Same industry: Dummy variable equal to one if the acquirer and target have the same three-digit SIC code (Source: SDC).

Share border: Dummy variable equal to one if the acquirer and target nations share the same border (Source: CEPII).

Somatic distance: The sum of the absolute difference between a sample of European countries in each of three traits of the indigenous population: height, hair color, and cephalic index as reported by Biasutti (1954) (Source: Online Appendix of Guiso, Sapienza, and Zingales, 2009).

Target defense: Dummy variable equal to one if a target company uses anti-takeover defenses to attempt to prevent the merger (Source: SDC).

Tender offer: Dummy variable equal to one if a merger is a tender offer, zero otherwise (Source: SDC).

Termination fee: Dummy variable equal to one if the merger agreement includes an acquirer or target termination fee (Source: SDC).

Transaction value: The dollar value of all consideration paid in a merger minus costs and fees (Source: SDC).

Trust: Average answer to the following question: "Generally speaking, would you say that (1) Most people can be trusted (2) Need to be very careful" (Question V25) (Source: World Values Survey).

Appendix C. Supplementary data

Supplementary data associated with this article can be found in the online version at http://dx.doi.org/10.1016/j.jfineco.2012.08.006.

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