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# Cross-Border M&A Inflows and the Quality of Institutions: A Cross-Country Panel Data Analysis<sup>\*</sup>

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## Abstract

This paper provides an empirical explanation to the observed disparity in cross-border M&A inflows to developing and developed countries over the last two decades. We show two main results. First, the disparity can be attributed to the difference in the quality of institutions between the two groups of countries. Second, the gain from reforming institutions in developing countries is smaller than that in developed countries. These findings suggest that, with the current speed of institutional reforms in developing countries, the disparity is likely to persist.

**Keywords:** cross-border M&A inflows, quality of institutions, developing- and developed countries, pooled-data and panel data analysis, correlated random effects

**JEL classification:** C23; F21; G34; O16; O57

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## 1. Introduction

The value of completed cross-border Mergers and Acquisitions (M&A) activities has surged dramatically over the last decades from less than \$100 billion in 1987 to \$720 billion in 1999.<sup>1</sup> This dramatic surge is driven by among others; the rapid development of global financial-market, the increasing international capital-mobility, and the advances in technology.<sup>2</sup> However, from a closer look at the data, one can observe that the majority of cross-border M&A have mainly flown to developed countries. Figure 1 shows that there is a substantial gap between the values of cross-border M&A inflows to developing countries and those to developed countries over the period of 1987-2002.<sup>3</sup>

**[INSERT FIGURE 1 HERE]**

This uneven distribution of cross-border M&A inflows into these two groups of countries can not really be accounted for by the aforementioned driving forces behind the surge in cross-border M&A activities. If that had indeed been the case, one should have expected that, based on convergence and catching-up theories of economic growth, cross-border M&A inflows to developing countries would have increased over time at a faster rate than those to developed countries. Consequently, the disparity between M&A inflows to those two groups of countries would have narrowed down over time. However, as Figure 1 shows, it does not seem to be the case.

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<sup>1</sup> See UNCTAD's foreign direct investment database (<http://www.unctad.org>).

<sup>2</sup> Some recent studies that analyze the cross-border M&A are Evenett (2003), di-Giovanni (2005) and Rossi and Volpin (2005). We provide a review of these papers in section 2.

<sup>3</sup> We use the values of cross-border M&A inflows in the Foreign Direct Investment (FDI) Interactive Database of the United Nations Conference on Trade and Development (UNCTAD) over the period of 1987-2002. In the database, FDI is divided into two components, namely cross-border M&A and greenfield investment. For the purpose of our analysis, we focus on the cross-border M&A component.

In this paper, we show that the gap in cross-border M&A inflows to these two groups of countries can be attributed to the quality of their institutions. Thus, institutions are the source of sluggishness of cross-border M&A inflows to developing countries. We also show that the increase in cross-border M&A inflows resulted from an improvement in the quality of institutions is smaller for developing countries than for developed countries. This suggests that with the current speed of institutional reforms in developing countries the disparity is likely to persist.

For the purpose of our analysis, we utilize three different databases. The first one is UNCTAD's FDI interactive database. From this database we obtain data on the aggregate cross-border M&A inflows. The second one is Kaufmann, Kraay, and Mastruzzi database (Kaufmann, Kraay, and Mastruzzi 2003), which provides comprehensive indices of institutional governance of nations that consist of; *voice and accountability*, *political stability*, *government effectiveness*, *regulatory quality*, *rule of law*, and *control of corruption*. The third one is the World Development Indicators (WDI) database that provides data on GDP, trade, technological improvement and financial market development. Our data spans the period of 1995-2002 and consists of 172 countries. In our empirical analysis, we employ pooled OLS estimation as our benchmark framework and also correlated-random-effects estimation to take advantage of the panel structure of our data.

The paper is organized as follows: Section 2 provides a summary of the related literature on cross-border M&A. In this section, we also review some related papers on corporate governance that lend support, albeit indirectly, to our hypothesis on the positive link between cross-border M&A inflows and the quality of countries' institutional

governance. Section 3 describes our hypothesis and methodology. Section 4 describes the data used in our analysis. Section 5 presents our main results and robustness tests. Section 6 concludes our paper with some remarks.

## **2. Related Literature**

There is a few but growing empirical literature on the determinants of cross-border M&A inflows and the link between cross-border M&A inflows and the quality of countries' institutions. In this section, we discuss this empirical literature in order to highlight main differences between our paper and the existing papers and to derive a testable hypothesis on the link between cross-border M&A and the quality of institutions for our empirical analysis.

Evenett (2003) analyzes the impact of cross-border M&A in the banking sector in industrialized nations on the performance of the sector. More specifically, he focuses on the interest-rate spreads as an indicator of performance. He shows that the impact of cross-border M&A on performance differs significantly between EU countries and non EU industrialized countries. In addition to analyzing cross-border M&A in the banking sector, he also presents a general picture of the aggregated cross-border M&A in the world. He shows that the volume of cross-border M&A over the period of 1987 to 2000 differs markedly between developed and developing countries. Nevertheless, he does not explore further the possible causes for such a marked difference.

di-Giovanni (2005) focuses on the role of financial deepening in origin countries on the M&A flows to host countries. In contrast to our paper that only focuses on the aggregate

M&A inflows to host countries, his paper focuses on bilateral M&A inflows to host countries. He shows that the level of financial development of origin countries, as measured by the stock market capitalization to GDP ratio, has a strong positive association with cross-border bilateral M&A. Interestingly, he further analyzes a sub-sample consisting of cross-border bilateral M&A flows from only developed countries to both developed and developing countries. Focusing on this sub-sample, he shows that the effect of the level of financial development of origin countries on the value of cross-border M&A is larger when host countries are developed countries.

It should be noted that di-Giovanni (2005) did not evaluate the role of financial development of host countries, while we do that in this paper. We show that the level of financial development of host countries, which is a control variable in our empirical analysis, does not play a significant role in determining M&A inflows. On the basis of di-Giovanni's finding, the non-significant role of the financial development of host countries found in our paper implies that it is not the level of financial development of host countries that matters, but instead the level of financial development of origin countries.

Rossi and Volpin (2005) emphasize the role of corporate governance as determinants of cross-border M&A activities. Using accounting standards and shareholder protection as proxies for corporate governance, they show that the volume of M&A activities (both domestic and cross-border M&A) is significantly larger in countries whose accounting standards are better and shareholder protection is stronger. Focusing on the difference between cross-border and domestic M&A, they also show that the probability that a given deal is a cross-border M&A rather than a domestic M&A decreases with the quality of

investor protection of the target country. Our paper differs from theirs: Rather than looking into individual M&A transactions that are affected by firms' specific corporate governance variables, we investigate aggregated M&A inflows that are affected by country-wide institutional governance. This allows us to focus on the observed disparity in the cross-border M&A inflows to developing and developed countries. We believe that the role of broad proxies of countries' institutions is going to be more pronounced at an aggregate level.

Our hypothesis on the positive link between the quality of institutions and cross-border M&A inflows can be motivated using insights from the corporate governance literature. This literature shows a link between quality of institutions and ownership structure. Specifically, the extensive literature on corporate governance, which can be traced back to Manne (1965), shows that corporate assets could be channeled toward their best possible use. M&A is the instrument that facilitates these reallocations of control on corporate assets.<sup>4</sup> However, frictions such as transaction costs, information asymmetries, and agency conflicts can hinder these efficient transfers of control. Recent studies on corporate governance, which employ measures of the quality of legal and regulatory environment within a country as proxies for some of these frictions, show that differences in laws, regulation, and enforcement shape the ownership structure of firms (see, e.g., La Porta et al., 1997, 1998, and 1999). In general, the better the institutional quality is, the more likely it is that widely-held ownership structure will emerge.

The literature also shows a link between ownership structure and the emergence of

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<sup>4</sup> See Weston, Mitchell and Mulherin (2004) for a review on various M&A theories.

M&A. Hart (1995) and Shleifer and Vishny (1997), for example, show that a widely-held ownership structure stimulates an active role of the market for corporate-control, i.e. M&A. Hence, one can argue that M&A should occur more often in countries with widely-held ownership structure.

To summarize, the corporate governance literature reviewed above points to the following two implications. First, the better the institutional quality of a country is, the more likely it is that widely-held ownership structure will emerge in that country. Second, countries in which widely-held ownership-structure is common should attract more M&A inflows. Combining these two general implications, we can thus assert that *countries with better quality of institutions tend to have larger inflows of cross border M&A.*

### **3. Hypothesis and Methodology**

We examine whether improving the quality of host countries' institutions increases cross-border M&A inflows. We also test whether, as Figure 1 seems to suggest, the stage of countries' development matters. Hence, we set the following two hypotheses:

**Hypothesis 1:** The quality of host countries' institutions positively affects the cross-border M&A inflows.

**Hypothesis 2:** The effect of the quality of host countries' institutions on the cross-border M&A inflows to developing countries is smaller than that to developed countries.



To test these two hypotheses, we estimate the following regression:

$$\begin{aligned} \ln(M \& A)_{it} = & \alpha_0 + \alpha_1 \text{INSTITUTION}_{it} + \alpha_2 \text{DEVELOPED}_i \\ & + \alpha_3 (\text{INSTITUTION}_{it} \times \text{DEVELOPED}_i) + \sum_j \beta_j X_{jit} \quad (1) \\ & + \gamma \text{PERIOD2}_t + \delta_i + \varepsilon_{it} , \end{aligned}$$

where  $\ln(M \& A)_{it}$  is the logarithm of cross-border M&A inflows to country  $i$  from the rest of the world at time  $t$ ;  $\text{INSTITUTION}_{it}$  is a proxy for the quality of institutions in country  $i$  at time  $t$ ;  $\text{DEVELOPED}_i$  is a dummy variable that equals one for developed countries and zero otherwise;  $\text{INSTITUTION}_{it} \times \text{DEVELOPED}_i$  is the interaction term between the quality of institutions and the developed-countries dummy;  $X_{jit}$  is the  $j$ -th control variable for country  $i$  at time  $t$ ; and  $\text{PERIOD2}_t$  is a time period dummy. The country effect  $\delta_i$  represents time-invariant country-specific unobserved factors that may affect  $\ln(M \& A)_{it}$ .<sup>5</sup> The error term  $\varepsilon_{it}$  is countries' time-varying errors, which are assumed to be distributed independently of  $\delta_i$  and  $\text{PERIOD2}_t$ . We allow  $\varepsilon_{it}$  to be correlated across countries and time. To address potential biases in the estimation standard errors, we estimate Huber/ White heteroskedastic robust- and intragroup-correlation-adjusted standard error.

Our primary interests are the signs of both  $\alpha_1$  and  $\alpha_3$ . Positive  $\alpha_1$  is in favor of our first hypothesis that quality of institutions does affect cross-border M&A inflows. Positive

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<sup>5</sup> The country effects ( $\delta_i$ ) capture macro-determinants of M&A that we assume to be time-invariant such as labor cost, trade deficit, exchange rate and tax. They capture any discrepancies in the country's definition of cross-border M&A as well as its method of reporting. They also control for other time-invariant country's specific idiosyncrasies that are difficult to measure.

$\alpha_3$  supports our second hypothesis that the effect of the quality of institutions in developing countries is smaller than that in developed countries.

We start by estimating Equation (1) using pooled ordinary least square (pooled-OLS) model.<sup>6</sup> Subsequently, to take advantage of the panel structure of our data, we estimate it using correlated-random-effects model.

We choose correlated-random-effects model rather than the conventional fixed-effects or random-effects models for two reasons. First, the proxies for institutional quality do not vary that much over time. We would therefore get imprecise results should we use fixed-effects estimation. Second, the explanatory variables are likely to be correlated with the country-effects  $\delta_i$ , and this implies random-effects estimation would give us biased results.

Among various correlated-random-effects models, we choose Mundlak (1978)'s formulation for its simplicity. Mundlak models country-effects  $\delta_i$  as a function of the means of the time-varying explanatory variables;

$$\delta_i = \pi_1 \overline{INSTITUTION}_{it} + \pi_2 \overline{INSTITUTION}_{it} \times \overline{DEVELOPED}_i + \sum_j \pi_j \overline{X}_{jit} + \varphi_i,$$

in which  $\varphi_i$  is independent and identically distributed. Applying the generalized least square estimation on Equation (1) yields an estimator which is equivalent to the fixed-effects estimator.<sup>7</sup>

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<sup>6</sup> In the pooled-OLS model, we assume that the time-invariant, country-specific unobserved factors ( $\delta_i$ ) are uncorrelated with all explanatory variables. In other words, we consider  $\delta_i + \varepsilon_{it}$  as a composite error which is uncorrelated with all explanatory variables.

<sup>7</sup> Other correlated-random-effect models are presented in Chamberlain (1984), Hausman and Taylor (1981), Amemiya and MaCurdy (1986), Breusch, Mizon and Schmidt (1989) and Arrelano and Bover (1995). Some of them require richer type of variables and longer period of data.

## **4. Data**

We use three databases: UNCTAD's FDI interactive database for the cross-border M&A inflows, Kaufmann, Kraay, and Mastruzzi (2003) for the quality of institutions and World Development Indicators (WDI) for other control variables. This set of databases determines the number of countries we eventually include in our analysis. After eliminating countries whose data are not available, we end up with 172 countries over the period of 1995-2002.

### **4.1 Cross-border Merger and Acquisitions**

Our dependant variable is cross-border M&A inflows to host countries from the rest of the world. Because cross-border M&A inflows are recorded at the time the transactions are done, they vary widely from year to year. If many M&A deals are happened to be concluded in a year, some countries may record unusually large cross-border M&A inflows in that single year. This peculiar recording method may be problematic because the actual payments or capital inflows may take place several years after the deals are completed. Therefore, to have a good measure of cross-border M&A inflows, we take the averages of M&A inflows over several years. More specifically, we consider two four-year periods: 1995-1998 and 1999-2002.

Even after taking the averages of two four-year periods, some countries have zero cross-border M&A inflows. Since we use the logarithm of M&A inflows in the regression, those zero M&A observations are problematic. To get around of this problem, we add one

to those averages before taking the logarithms.<sup>8</sup>

## 4.2 Quality of institutions

We want to use proxies that are able to capture many dimensions of quality of government institutions and that are available for the largest possible set of countries. The first criterion is important because we want to analyze how different dimensions of quality of institutions affect cross-border M&A inflows. The second one is also necessary to strengthen the power of our hypothesis testing. For these reasons, we choose the set of institutional variables constructed by Kaufmann, Kraay, and Mastruzzi (2003).<sup>9</sup> Using a large number of variables measuring perceptions on institutional governance, compiled from 25 separate data sources constructed by 18 different organizations, they estimate six dimensions of institutional governance covering 199 countries and territories in 1996, 1998, 2000 and 2002.

These indicators are *Voice and Accountability*, *Political Stability*, *Government Effectiveness*, *Regulatory Quality*, *Rule of Law*, and *Control of Corruption*. *Voice and Accountability* measures the extent of citizen participation in political election and decision making process as well as in keeping check and balances among government institutions. It includes various aspects of political process, civil liberties, political rights and the

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<sup>8</sup> Some authors (see for example Rose, 2000) simply exclude the zero observations. When we drop the zero M&A observations from our sample, we find our results are quite robust (the results are available from authors upon requests). Others such as Eichengreen and Irwin (1995, 1997) propose adding one to each observation before taking the logarithm. If the value of M&A is large, the latter approach has the advantage of having the coefficient interpreted as semi-elasticity.

<sup>9</sup> These institutional variables are widely used in the literature. Examples of some recent works that use these institutional variables are, among others, Borrmann, Busse and Neuhaus (2006), Campante, Chor and Do (2006) and Rose and Spiegel (2006).

independence of the media. *Political Stability* measures the solidity of government institutions to political shocks, domestic violence and terrorism which directly affect the continuity of policies. It includes perception on the possibility of unconstitutional coup d'état as a result of, among others, domestic violence and terrorism. *Government Effectiveness* measures the government capacity in producing public goods as well as in designing and implementing sound policies. It includes the quality of the bureaucracy and public service provision, credibility of government's commitment to its policies, and the independence of the civil service from political pressures.

*Regulatory Quality* measures the quality of various government policies such as market-friendliness of policies. *Rule of Law* measures the fairness and predictability of rules of economic and social interaction as well as the extent of property rights protection. It includes perceptions on the incidence of crime, the effectiveness and predictability of the judiciary, and the enforceability of contracts. *Control of Corruption* measures perceptions of corruption alleviation in which corruption is defined as the exercise of public power for private gains.

Two things are noteworthy. First, almost all point estimates of these measures of quality of institutions range from -2.5 to 2.5; the larger the number is, the higher the quality of institutions will be. For the period of 1995-1998, we use the average values of each of those institutional variables in 1996 and 1998, and for the period of 1999-2002 we use the average values in 2000 and 2002. We present the descriptive statistics of these variables and of others in Table 1 in Appendix. Second, because these measures are highly correlated with each other (as can be seen from Table 2 in appendix, correlation coefficients range

from 0.70 to 0.96), they cannot be simultaneously included as explanatory variables in a regression. Therefore, we estimate several regressions; each of them uses one measure of the quality of institutions along with the other explanatory variables.

Alternatively, to get an overall effect of the quality of institutions on cross-border M&A inflows, and yet to avoid bias due to the omission of some institutional variables from the regression, we develop a composite index of institutional quality comprising these institutional variables using the *principal component analysis* (PCA). We use the first principal component as a summary measure of the overall quality of institutions.<sup>10</sup> We experiment with several composite indices. The most comprehensive one, which uses all six variables, is *INST6*. The other is *INST5* in which *Political Stability* is excluded for a reason that we will explain later.

### **4.3 Control variables**

We use several control variables such as  $\ln(GDP)_{t-1}$ , *OPENNESS*, *JOURNALS*, and *MARKETCAP*. We take all four variables from the World Development Indicators (WDI) CD-ROM. As the proxy for *OPENNESS*, we use the ratio of volume of trade, i.e. exports and imports, to GDP. For *JOURNALS* and *MARKETCAP*, we use the number of journal articles published (per million people) and market capitalization (as a percentage of GDP), respectively. To address potential simultaneity problem between the size of the economy

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<sup>10</sup> PCA is a multivariate procedure that rotates all variables such that maximum variations are projected onto new mutually orthogonal axes. It transforms a group of correlated variables into a set of uncorrelated underlying variables called principal components. These principal components are linear combinations of the original variables in which the first principal component, and each of subsequent ones, capture most variations in data.

and the cross-border M&A inflows, we use the average of previous four-year GDP,  $\ln(GDP)_{t-1}$ , as the proxy for the size of the economy. For the other three control variables, we continue using their current four-year averages because apriori they do not seem to cause serious simultaneity problem.<sup>11</sup>

In the analysis we also experiment with alternative proxies for the technological advancement, i.e. the expenditure on R&D as a percentage of GDP and the number of patents per million people, and for the level of financial development, i.e. the ratio of M2 and bank's credit to GDP.

#### 4.4 Dummy variables

To capture the possibility that explanatory variables may affect cross-border M&A inflows to developed- and developing countries differently, we introduce a dummy variable for developed countries, *DEVELOPED*. We follow the classification of countries' development level used in the UNCTAD's FDI Interactive Database, which is conventionally employed in the literature. *DEVELOPED* equals one for US, West European countries, Japan, Australia, New Zealand and some more countries; and zero otherwise. (See Table 3 in Appendix for a complete list of countries included in the sample and their status of development.)

The developed countries dummy, *DEVELOPED*, would therefore capture the developed country specific characteristics that have not been taken into account by other explanatory

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<sup>11</sup> We also use lagged openness to trade,  $OPENNESS_{t-1}$  and run the same set of regressions. The results are quite robust. They are available from authors upon request.

variables. Its interaction with the quality of institutions,  $INSTITUTION \times DEVELOPED$ , would allow both groups of countries to have different effects of reforming government institutions on cross-border M&A inflows.

We also introduce a dummy for the second period,  $PERIOD2$ , to take into account any changes in factors which affect cross-border M&A across time. They are, for example, the world's investment climate and the world economic growth.  $PERIOD2$  equals one for the period of 1999-2002 and zero for the period of 1995-1998.

## 5. Empirical Results

### 5.1 Main Results

Table 4 presents the results of the pooled-OLS models. (The numbers in parentheses are the p-values, which are computed using the panel-robust standard errors.) First we include  $\ln(GDP)_{t-1}$  and  $OPENNESS$  only as control variables (see Regressions 1-8). All six individual measures of the quality of institutions and the two composite indices,  $INST6$  and  $INST5$ , are highly significant, thereby confirming our first hypothesis that M&A inflows depend on investors' perception about the quality of the host countries' institutions.

**[INSERT TABLE 4 HERE]**

The magnitude of their estimates suggests that *Regulatory Quality* has the strongest effect on M&A inflows, followed by *Voice and Accountability* and *Government Effectiveness*. The effects of *Control of Corruption*, *Rule of Law* and *Political Stability* appear to be less important compared to the first two measures. *Control of Corruption* and



*Rule of Law*, to some extent, have a weak positive effect on M&A inflows, which suggests that investors may continue investing in countries where corruption is prevalent and legal apparatus have not been fully developed like in China or Indonesia.

The weaker effect of *Political Stability* on M&A inflows is rather puzzling. We expect that investors would be concerned with the host countries' political stability as much as, if not more than, their regulatory quality. This result seems to suggest that political stability is a prerequisite for M&A inflows, and once a country achieves sufficient political stability, a further improvement in the degree of political stability tends to have little impact on M&A inflows.

The interaction terms between individual proxies for institutional quality and the developed-countries dummy ( $INSTITUTION \times DEVELOPED$ ) are in general statistically significant at 5% significance level, except for  $Political\ Stability \times DEVELOPED$ . Therefore, overall this finding confirms our second hypothesis. More specifically, these results suggest that the way the quality of institutions affects M&A is structurally different in these two groups of countries: The effect of improving quality of institutions on cross-border M&A inflows in a developing country is not as high as that in a developed country.

The insignificance of  $Political\ Stability \times DEVELOPED$  seems to suggest that political stability affects the cross-border M&A inflows in both developed- and developing countries similarly. Investors are less likely to invest in countries that are politically unstable irrespective of their level of development.

The interaction term between the composite index of institutional quality and the developed-countries dummy,  $INST6 \times DEVELOPED$ , is not significant which may be due

to the insignificance of *Political Stability* × *DEVELOPED*. To verify this, we exclude *Political Stability* from our composite index in the regression; thus we use *INST5* × *DEVELOPED* instead. Regression 8 of Table 4 shows *INST5* × *DEVELOPED* is statistically significant.

Control variables,  $\ln(\text{GDP})$  and *OPENNESS*, are all significant and their estimates are quite stable from one regression to another. The only exception is *OPENNESS* in the regression in which we use *Regulatory Quality* as a proxy for the quality of institutions. Probably, the insignificance of *OPENNESS* is due to the inclusion of some measures of openness to trade in *Regulatory Quality*.

Then, we introduce the proxies for technological advancement and financial development, i.e. *JOURNALS* and *MARKETCAP*, as additional control variables (see Regressions 9-16 in Table 4).<sup>12</sup> However, we find that they are statistically insignificant. Their insignificance implies that, once we explicitly control for the quality of institutions in our regressions, the technological advancement and the level of financial development of the host countries are not important determinants of the cross-border M&A inflows. From the viewpoint of di-Giovanni (2005), the insignificant role of the host countries' financial development is plausible: What really matters for cross-border M&A inflows is not the level of financial development of the host countries, but rather that of the *origin* countries.

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<sup>12</sup> We experiment using the R&D expenditure as a percentage of GDP and the number of patents per million people as alternative proxies for the level of technological advancement; and the ratios of M2 and bank credit to GDP as an alternative proxy for the level of financial development. We find that in most cases they are insignificant, or they make the estimation of *INSTITUTION* or *INSTITUTION* × *DEVELOPED* imprecise due to multicollinearity. In the paper, we only report the regression results in which we use *JOURNALS* as a proxy for the host countries' level of technological advancement and *MARKETCAP* is used as a proxy for the host countries' level of financial development. Other results are available from the authors upon request.

The time dummy, *PERIOD2* is always significant in all regressions. The developed-country dummy, *DEVELOPED* is significant in almost all regressions, except in regression 2 of Table 4 in which we use *Political Stability* as a proxy for the quality of institutions.

Table 5 presents the results of the correlated-random effects models (see Regressions 1-8). Because the explanatory variables are highly correlated with their corresponding means, our estimations suffer from multicollinearity problem. As a result, many of the explanatory variables become insignificant. Our variables of interests, *INSTITUTION* and *INSTITUTION* × *DEVELOPED*, are significant only for some proxies of institutional quality i.e. *Regulatory Quality* in Regression 4, and the composite indices, *INST6* and *INST5*, in Regressions 7 and 8.

**[INSERT TABLE 5 HERE]**

To avoid the multicollinearity problem and to better evaluate the magnitude and statistical significance of variables of interest, we drop the means of *INSTITUTION* and *INSTITUTION* × *DEVELOPED* from the regressions. Results similar to those of the previous pooled-OLS analysis then emerge (see Regressions 9-16 in Table 5). Except for *Political Stability*, all proxies for the institutional quality - both individual proxies and the composite indices - and their interaction terms with the developed-countries dummy are now statistically significant. If we include *JOURNALS* and *MARKETCAP* as additional control variables, we also find that in all specifications they remain insignificant.<sup>13</sup>

We interpret the results in Table 4 and 5 as follows: Holding  $\ln(GDP)$  and *OPENNESS* constant at some values, the relationship between  $\ln(M\&A)$  and the quality of institutions is

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<sup>13</sup> The results are available from the authors upon request.

kinked as shown in Figure 2.

**[INSERT FIGURE 2]**

The vertical intercepts of the lines for the developing- and developed countries are respectively the estimates of  $\alpha_0$  and  $\alpha_0 + \alpha_2$ . Both  $\alpha_0$  and  $\alpha_2$  are negative; therefore the vertical intercept for developed countries is smaller than that for developing countries. The slopes of the lines for developing- and developed countries are respectively the estimates of  $\alpha_1$  and  $\alpha_1 + \alpha_3$ . Both  $\alpha_1$  and  $\alpha_3$  are positive; thus the line for developed countries is steeper than that for developing countries. Because almost all developing countries in the sample cluster at a lower range of values of the quality of institutions, while most developed countries cluster at a higher range of values, Figure 2 suggests that the relationship between  $\ln(M\&A)$  and the quality of institutions could be non-linear.

All in all, our results suggest that the quality of institutions matters and the effect of institutional reform on cross-border M&A inflows in developing countries is smaller than that in developed countries. Hence, we can attribute the disparity between cross-border M&A inflows to developed- and developing countries to the quality of institutions in these two groups of countries. It implies that, with the current speed of the institutional reform in developing countries, a large portion of M&A would continue flowing to developed countries and the M&A disparity would persist for some time.

## 5.2 Further analysis

We check the robustness of our results. First, we re-estimate Equation (1) using the two-year averages of the cross-border M&A rather than their four-year averages. In the pooled-OLS estimation, we find that *INSTITUTION* and *INSTITUTION* × *DEVELOPED* are statistically significant in all regressions, except for the regression in which we use *Political Stability* as a proxy for the institutional quality. In the correlated random-effects estimation in which we exclude the mean of *INSTITUTION* and the mean of *INSTITUTION* × *DEVELOPED*, we find that all six proxies for the institutional quality remain statistically significant. Some interaction terms in the regressions that use *Voice and Accountability* and *Control of Corruption* as proxies for the institutional quality are insignificant. Like those in our basic results, the interaction term *Political Stability* × *DEVELOPED* is insignificant in all regressions.<sup>14</sup>

Second, to increase the variation of *INSTITUTION* over time, at the cost of less accurate values of M&A inflows, we experiment with regressions using only the proxies of institutional quality in the years of 1996 and 2002. Using this data, along with the corresponding two-year averages of M&A inflows and other control variables, we estimate the full specification of the correlated-random-effects model in which we include *INSTITUTION*, *INSTITUTION* × *DEVELOPED*,  $\ln(\text{GDP})$ , *OPENNESS*, and all of their time averages in the regressions. We find that *Voice and Accountability*, *Regulatory Quality*, and *Control of Corruption* are statistically significant at 5% significance level, *Political Stability* and *Rule of Law* are significant at 10% significance level, and *Government*

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<sup>14</sup> The results are available from authors upon request.

*Effectiveness* is significant only at 20% significance level. The interaction terms between proxies for the institutional quality and the developed-countries dummy are only significant in the regressions in which we use *Government Effectiveness* and *Rule of Law* as proxies for the institutional quality.<sup>15</sup>

Third, our regressions may suffer from simultaneity problem. We have used the lagged size of the economy,  $\ln(GDP)_{t-1}$ , in all regressions shown in Tables 4 and 5. To address simultaneity problem between openness to trade and cross-border M&A inflows, we also run the same set of regressions using the average of previous four-year of openness to trade,  $OPENNESS_{t-1}$ . We find robust estimates.<sup>16</sup>

Lastly, because the quality of institutions does not change much from year to year, we get imprecise results if we estimate Equation (1) using fixed-effects model. However, if we use the proxies of the quality of institutions in the earliest- and last-period only, their variations are sufficiently large so that the results of fixed-effect models are more significant statistically.

**[INSERT TABLE 6 HERE]**

Table 6 presents the estimates which show that our basic results are quite robust. We find that individual quality of institutions is statistically significant at about 10% level, except for *Government Effectiveness* which is significant at about 20% only. The significance of interaction terms varies: *Government Effectiveness* × *DEVELOPED* and *Rule of Law* × *DEVELOPED*, are statistically significant at about 5% level;

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<sup>15</sup> The results are available from authors upon request.

<sup>16</sup> The results are available from authors upon request.

*Regulatory Quality* × *DEVELOPED* and *Control of Corruption* × *DEVELOPED* are significant at 20% and 25% level, respectively; and the remaining measures are not statistically significant.

## **6. Concluding Remarks**

Over the last two decades, we observe that most cross-border M&A have flown toward developed countries. This paper empirically examines whether the quality of government institutions explains this disparity and whether the quality of government institutions affects cross-border M&A inflows to two groups of countries - developing vs. developed ones differently.

Our empirical results show that the quality of institutions does matter and the effect of institutional reform on cross-border M&A inflows in developing countries is smaller than that in developed countries. These results imply that, with the current speed of institutional reforms in developing countries, the disparity may likely to persist.

We could further explore the nonlinearity of the relationship between the cross-border M&A and the quality of institutions. It would also be interesting to learn whether or not the quality of institutions affects different types of M&A differently. Borrowing the framework of the gravity models, we could also estimate the effect of the quality of institutions on ‘bilateral’ cross-border M&A inflows. We leave all these analysis for future research.

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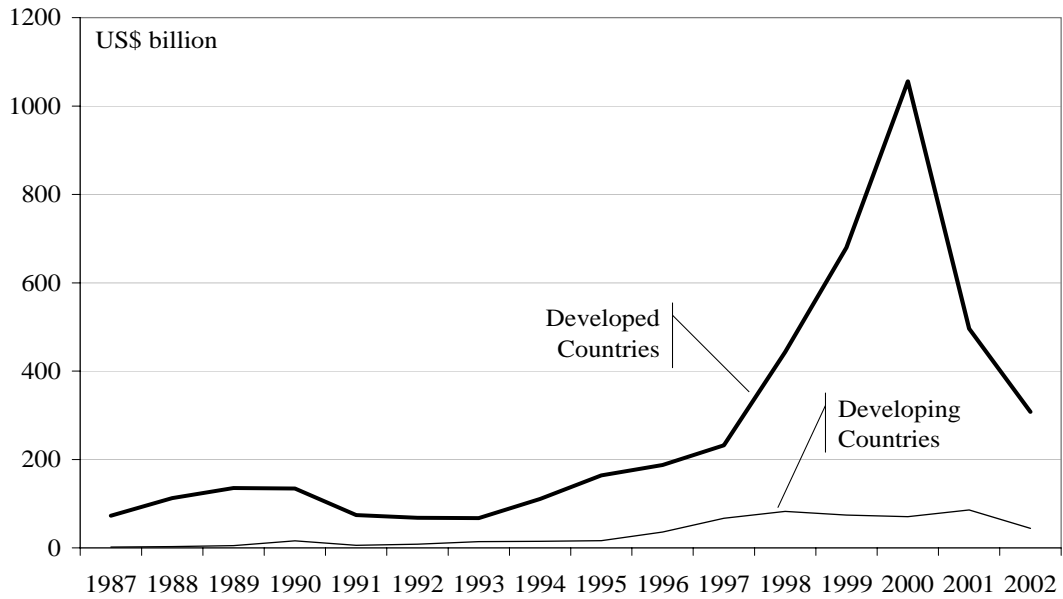


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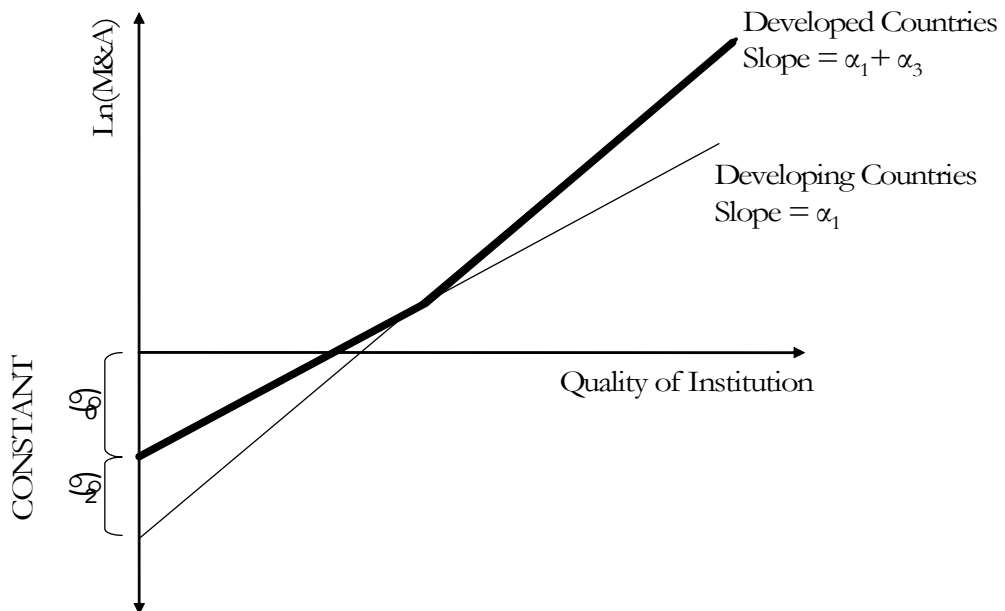
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## Appendix



[Figure 1: Cross-Border M&A inflows: Developing vs. Developed Countries]



[Figure 2: Kinked “returns on Institutional Reform”]

	Mean	Std Dev	Min	Max	#obs
<b>Voice and Accountability</b>	-0.05	0.97	-2.17	1.65	369
<b>Political Stability</b>	0.01	0.94	-2.62	1.68	343
<b>Government Effectiveness</b>	-0.01	0.95	-2.28	2.37	366
<b>Regulatory Quality</b>	-0.01	0.94	-3.01	2.08	367
<b>Rule of Law</b>	-0.01	0.97	-1.96	2.21	368
<b>Control of Corruption</b>	-0.01	0.96	-1.82	2.47	366
<b>Openness (% of Exports and Imports in GDP)</b>	84.9	43.5	2.4	278.3	344
<b>Journal article published (per million people)</b>	92.8	198.0	0.0	969.9	360
<b>Market Capitalization (% of GDP)</b>	41.6	51.5	0.1	338.4	219

[Table 1: Descriptive Statistics]

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
<b>Voice and accountability</b> (1)	1											
<b>Political stability</b> (2)	0.72	1										
<b>Government effectiveness</b> (3)	0.77	0.80	1									
<b>Regulatory quality</b> (4)	0.79	0.70	0.87	1								
<b>Rule of law</b> (5)	0.78	0.81	0.95	0.86	1							
<b>Control of corruption</b> (6)	0.77	0.80	0.96	0.84	0.96	1						
<b>INST6</b> (7)	0.86	0.87	0.97	0.91	0.97	0.97	1					
<b>INST5</b> (8)	0.86	0.82	0.97	0.92	0.97	0.97	1.00	1				
<b>Developed country</b> (9)	0.68	0.59	0.76	0.63	0.76	0.78	0.76	0.77	1			
<b>Openness</b> (10)	0.12	0.32	0.22	0.23	0.23	0.19	0.24	0.21	0.02	1		
<b>Journals published</b> (11)	0.67	0.57	0.77	0.65	0.77	0.81	0.77	0.79	0.83	-0.02	1	
<b>Market capitalization</b> (12)	0.37	0.39	0.61	0.54	0.59	0.59	0.56	0.58	0.43	0.34	0.51	1

[Table 2: Cross-Correlation]

<b>Developed Countries</b>	<b>Developing Countries</b>				
Australia	Albania	Congo, Dem. Rep.	Hungary	Morocco	South Africa
Austria	Algeria	Congo, Rep.	India	Mozambique	Sri Lanka
Belgium	Angola	Costa Rica	Indonesia	Namibia	Sudan
Canada	Antigua and Barbuda	Cote d'Ivoire	Iran, Islamic Rep.	Nepal	Suriname
Denmark	Argentina	Croatia	Jamaica	Nicaragua	Swaziland
Finland	Armenia	Cyprus	Jordan	Niger	Syrian Arab Republic
France	Azerbaijan	Czech Republic	Kazakhstan	Nigeria	Tajikistan
Germany	Bahrain	Djibouti	Kenya	Oman	Tanzania
Greece	Bangladesh	Dominica	Kiribati	Pakistan	Thailand
Iceland	Barbados	Dominican Republic	Korea, Rep.	Panama	Togo
Ireland	Belarus	Ecuador	Kuwait	Papua New Guinea	Tonga
Israel	Belize	Egypt, Arab Rep.	Kyrgyz Republic	Paraguay	Trinidad and Tobago
Italy	Benin	El Salvador	Lao PDR	Peru	Tunisia
Japan	Bhutan	Equatorial Guinea	Latvia	Philippines	Turkey
Luxembourg	Bolivia	Eritrea	Lebanon	Poland	Turkmenistan
Malta	Bosnia and Herzegovina	Estonia	Lesotho	Qatar	Uganda
Netherlands	Botswana	Ethiopia	Libya	Romania	Ukraine
New Zealand	Brazil	Fiji	Lithuania	Russian Federation	United Arab Emirates
Norway	Bulgaria	Gabon	Macao, China	Rwanda	Uruguay
Portugal	Burkina Faso	Gambia, The	Macedonia, FYR	Saint Kitts and Nevis	Uzbekistan
Spain	Burundi	Georgia	Madagascar	Saint Lucia	Vanuatu
Sweden	Cambodia	Ghana	Malawi	Saint Vincent and the Grenadines	Venezuela, RB
Switzerland	Cameroon	Grenada	Malaysia	Samoa	Vietnam
United Kingdom	Cape Verde	Guatemala	Maldives	Sao Tome and Principe	West Bank and Gaza
United States	Central African Republic	Guinea	Mali	Saudi Arabia	Yemen, Rep.
	Chad	Guinea-Bissau	Mauritania	Seychelles	Zambia
	Chile	Guyana	Mauritius	Sierra Leone	Zimbabwe
	China	Haiti	Mexico	Slovenia	
	Colombia	Honduras	Moldova	Solomon Islands	
	Comoros	Hong Kong, China	Mongolia	Somalia	

[Table 3: List of Countries]

Dependent Variable: $\ln(M\&A)_{it}$																
Proxy of Institutions																
	A	S	G	R	L	C	INST6	INST5	A	S	G	R	L	C	INST6	INST5
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
<b>INSTITUTION<sub>it</sub></b>	1.186	0.596	0.924	1.363	0.637	0.605	0.509	0.567	1.038	0.227	0.428	1.430	0.007	-0.021	0.313	0.367
	(0.000)	(0.000)	(0.000)	(0.000)	(0.008)	(0.010)	(0.000)	(0.000)	(0.000)	(0.372)	(0.176)	(0.000)	(0.984)	(0.946)	(0.021)	(0.014)
<b>INSTITUTION<sub>it</sub>*DEVELOPED<sub>i</sub></b>	2.126	-0.187	0.861	1.451	0.863	0.685	0.292	0.355	1.357	0.121	0.911	1.188	0.779	0.653	0.323	0.432
	(0.035)	(0.674)	(0.003)	(0.000)	(0.006)	(0.024)	(0.167)	(0.011)	(0.243)	(0.725)	(0.055)	(0.025)	(0.085)	(0.129)	(0.191)	(0.079)
<b>JOURNALS<sub>it</sub></b>									0.001	0.002	0.001	0.001	0.002	0.002	0.001	0.001
									(0.517)	(0.013)	(0.157)	(0.418)	(0.065)	(0.114)	(0.338)	(0.565)
<b>MARKETCAP<sub>it</sub></b>									0.004	0.003	0.001	-0.001	0.003	0.003	0.001	0.001
									(0.105)	(0.295)	(0.717)	(0.760)	(0.318)	(0.326)	(0.629)	(0.784)
<b><math>\ln(GDP)_{it-1}</math></b>	1.065	1.117	0.955	0.891	0.987	1.024	1.018	0.943	1.048	1.061	1.055	1.011	1.062	1.077	1.051	1.048
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
<b>OPENNESS<sub>it</sub></b>	0.005	0.005	0.004	0.002	0.006	0.006	0.002	0.003	0.003	0.005	0.005	0.002	0.007	0.007	0.004	0.004
	(0.018)	(0.032)	(0.080)	(0.177)	(0.022)	(0.005)	(0.342)	(0.210)	(0.280)	(0.155)	(0.155)	(0.569)	(0.069)	(0.046)	(0.294)	(0.264)
<b>PERIOD2<sub>t</sub></b>	0.326	0.453	0.342	0.304	0.348	0.342	0.446	0.346	0.424	0.464	0.434	0.432	0.430	0.439	0.465	0.455
	(0.006)	(0.001)	(0.006)	(0.012)	(0.005)	(0.006)	(0.001)	(0.005)	(0.007)	(0.008)	(0.010)	(0.009)	(0.011)	(0.010)	(0.006)	(0.006)
<b>DEVELOPED<sub>i</sub></b>	-3.284	0.890	-1.191	-1.604	-0.849	-0.754	-1.484	-1.660	-2.543	-0.346	-1.563	-1.950	-1.092	-0.848	-1.601	-1.911
	(0.024)	(0.164)	(0.003)	(0.000)	(0.011)	(0.026)	(0.069)	(0.000)	(0.085)	(0.497)	(0.008)	(0.003)	(0.005)	(0.057)	(0.023)	(0.004)
<b>Constant</b>	-21.481	-22.968	-18.913	-17.345	-19.844	-20.741	-20.253	-18.494	-20.961	-21.555	-21.262	-20.111	-21.658	-22.058	-21.073	-20.991
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
<b>No. observations</b>	339	315	337	338	338	337	315	337	212	211	211	212	212	211	211	211
<b>R<sup>2</sup></b>	0.80	0.74	0.76	0.81	0.75	0.75	0.77	0.78	0.75	0.70	0.71	0.76	0.70	0.70	0.72	0.72
<b>F-statistic</b>	318	171	296	391	223	247	266	319	87	87	98	155	87	97	103	114
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)

Notes: (a) The numbers in parentheses are the p-values, computed using robust standard errors. (b) The shorthands for the proxy of quality of institutions: A = Voice and Accountability; S = Political Stability; G = Government Effectiveness; R = Regulatory Quality; L = Rule of Law; C = Control of Corruption; INST6 = the first principal component of all six measures of institution; INST5 = the first principal component of all measures of institutions except Political Stability. (c) How to read this table: Regression (1), for example, is the result of regressing  $\ln(M\&A)$  on Voice and Accountability, Voice and Accountability\*DEVELOPED,  $\ln(GDP)$ , OPENNESS, PERIOD2, and DEVELOPED using OLS.

[Table 4: Pooled OLS Model]

Dependent Variable: $\ln(M\&A)_{it}$																
	Proxy of Institutions															
	A	S	G	R	L	C	INST6	INST5	A	S	G	R	L	C	INST6	INST5
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
<b>INSTITUTION<sub>it</sub></b>	1.736 (0.000)	0.065 (0.868)	0.221 (0.610)	1.148 (0.006)	0.237 (0.560)	0.383 (0.386)	0.683 (0.007)	0.612 (0.025)	1.219 (0.000)	0.500 (0.002)	0.806 (0.000)	1.315 (0.000)	0.541 (0.011)	0.557 (0.009)	0.516 (0.000)	0.558 (0.000)
<b>INSTITUTION<sub>it</sub>*DEVELOPED<sub>i</sub></b>	2.338 (0.501)	2.305 (0.108)	2.892 (0.023)	1.535 (0.055)	2.119 (0.296)	0.066 (0.966)	1.603 (0.010)	1.593 (0.041)	2.141 (0.047)	0.122 (0.827)	1.055 (0.000)	1.479 (0.000)	1.026 (0.005)	0.689 (0.011)	0.403 (0.078)	0.435 (0.003)
<b><math>\ln(GDP)_{it-1}</math></b>	-0.038 (0.939)	0.498 (0.387)	0.417 (0.458)	0.460 (0.394)	0.427 (0.445)	0.482 (0.389)	0.366 (0.522)	0.314 (0.569)	0.091 (0.858)	0.439 (0.447)	0.331 (0.555)	0.467 (0.383)	0.393 (0.484)	0.501 (0.370)	0.370 (0.517)	0.304 (0.582)
<b>OPENNESS<sub>it</sub></b>	0.000 (0.962)	-0.002 (0.820)	0.001 (0.929)	-0.004 (0.676)	0.003 (0.737)	0.003 (0.760)	-0.011 (0.270)	-0.002 (0.825)	0.002 (0.833)	-0.006 (0.548)	0.002 (0.847)	-0.004 (0.622)	0.002 (0.806)	0.002 (0.788)	-0.007 (0.466)	0.000 (0.982)
<b>PERIOD2<sub>t</sub></b>	0.575 (0.000)	0.522 (0.006)	0.434 (0.013)	0.411 (0.023)	0.446 (0.011)	0.447 (0.011)	0.580 (0.003)	0.444 (0.013)	0.537 (0.001)	0.591 (0.002)	0.459 (0.010)	0.412 (0.021)	0.466 (0.008)	0.439 (0.012)	0.588 (0.002)	0.473 (0.007)
<b>DEVELOPED<sub>i</sub></b>	-3.220 (0.024)	1.034 (0.076)	-1.121 (0.004)	-1.648 (0.000)	-0.783 (0.011)	-0.768 (0.029)	-1.280 (0.109)	-1.533 (0.000)	-3.354 (0.033)	0.671 (0.406)	-1.304 (0.003)	-1.578 (0.001)	-0.948 (0.067)	-0.666 (0.054)	-1.900 (0.040)	-1.890 (0.000)
<b>Means of INSTITUTION<sub>it</sub></b>	-0.562 (0.241)	0.566 (0.168)	0.716 (0.146)	0.197 (0.667)	0.379 (0.448)	0.215 (0.673)	-0.185 (0.499)	-0.060 (0.841)								
<b>Means of INSTITUTION<sub>it</sub>*DEVELOPED<sub>i</sub></b>	-0.246 (0.939)	-2.626 (0.062)	-2.078 (0.129)	-0.022 (0.979)	-1.267 (0.540)	0.643 (0.703)	-1.350 (0.025)	-1.257 (0.114)								
<b>Means of <math>\ln(GDP)_{it}</math></b>	1.106 (0.027)	0.610 (0.295)	0.536 (0.343)	0.431 (0.425)	0.561 (0.320)	0.540 (0.336)	0.651 (0.259)	0.633 (0.252)	0.975 (0.058)	0.675 (0.249)	0.635 (0.259)	0.428 (0.426)	0.602 (0.286)	0.525 (0.351)	0.642 (0.265)	0.638 (0.250)
<b>Means of OPENNESS<sub>it</sub></b>	0.005 (0.561)	0.007 (0.457)	0.003 (0.737)	0.006 (0.490)	0.003 (0.793)	0.004 (0.710)	0.013 (0.200)	0.005 (0.611)	0.004 (0.677)	0.012 (0.222)	0.003 (0.751)	0.007 (0.428)	0.004 (0.663)	0.004 (0.638)	0.009 (0.356)	0.003 (0.735)
<b>Constant</b>	-21.675 (0.000)	-22.762 (0.000)	-18.903 (0.000)	-17.438 (0.000)	-19.956 (0.000)	-20.779 (0.000)	-20.329 (0.000)	-18.648 (0.000)	-21.607 (0.000)	-23.050 (0.000)	-19.314 (0.000)	-17.556 (0.000)	-20.179 (0.000)	-20.899 (0.000)	-20.180 (0.000)	-18.548 (0.000)
<b>No. observations</b>	339	315	337	338	338	337	315	337	339	315	337	338	338	337	315	337
<b>R<sup>2</sup></b>	0.80	0.74	0.76	0.81	0.75	0.75	0.77	0.78	0.80	0.74	0.76	0.81	0.75	0.75	0.77	0.78

Notes: (a) The numbers in parentheses are the p-values, computed using panel-robust standard errors. (b) The shorthands for the proxy of quality of institutions: A = Voice & Accountability; S = Political Stability; G = Government Effectiveness; R = Regulatory Quality; L = Rule of Law; C = Control of Corruption; INST6 = the first principal component of all six measures of institution; INST5 = the first principal component of all measures of institutions except Political Stability. (c) How to read this table: Regression (1), for example, is the result of regressing  $\ln(M\&A)$  on Voice and Accountability, Voice and Accountability\*DEVELOPED,  $\ln(GDP)$ , OPENNESS, PERIOD2, DEVELOPED, and the means of time-varying explanatory variables using random-effects model.

Table 5: Correlated-Random Effect Model]

<b>Dependent Variable: <math>\ln(M\&amp;A)_{it}</math></b>						
	<b>Proxy of Institutions</b>					
	<b>A</b>	<b>S</b>	<b>G</b>	<b>R</b>	<b>L</b>	<b>C</b>
	<b>(1)</b>	<b>(2)</b>	<b>(3)</b>	<b>(4)</b>	<b>(5)</b>	<b>(6)</b>
<b>INSTITUTION<sub>it</sub></b>	1.503 (0.000)	0.464 (0.097)	0.594 (0.208)	1.104 (0.001)	0.606 (0.115)	0.851 (0.050)
<b>INSTITUTION<sub>it</sub>*DEVELOPED<sub>i</sub></b>	1.063 (0.725)	0.928 (0.409)	1.802 (0.057)	0.915 (0.166)	2.783 (0.000)	1.615 (0.229)
<b><math>\ln(GDP)_{it-1}</math></b>	0.553 (0.293)	1.038 (0.079)	0.685 (0.299)	0.718 (0.212)	0.913 (0.142)	1.001 (0.144)
<b>OPENNESS<sub>it</sub></b>	0.003 (0.697)	0.002 (0.767)	0.006 (0.428)	0.005 (0.483)	0.005 (0.515)	0.003 (0.742)
<b>PERIOD2<sub>t</sub></b>	0.185 (0.006)	0.160 (0.051)	0.113 (0.169)	0.116 (0.141)	0.158 (0.063)	0.134 (0.158)
<b>Constant</b>	-10.236 (0.401)	-21.376 (0.122)	-13.628 (0.374)	-14.097 (0.291)	-19.215 (0.186)	-20.760 (0.197)
<b>No. observations</b>	332	309	328	330	315	300
<b>R<sup>2</sup></b>	0.19	0.18	0.15	0.22	0.19	0.18

Notes: (a) The numbers in parentheses are the p-values, computed using panel-robust standard errors. (b) The shorthands for the proxy of quality of institutions: A = Voice & Accountability; S = Political Stability; G = Government Effectiveness; R = Regulatory Quality; L = Rule of Law; C = Control of Corruption. (c) How to read this table: Regression (1), for example, is the result of regressing  $\ln(M\&A)$  on Voice and Accountability, Voice and Accountability\*DEVELOPED,  $\ln(GDP)$ , OPENNESS, and PERIOD2 using fixed-effects model.

[Table 6: Fixed-effects model using earliest and last period data of Institution]