that time delays depress exports, at least part of which is due to compositional effects.

VI. Conclusions

We use a new data set on the time it takes to move containerized products from the factory gate to the ship in 126 countries. A difference gravity equation is first estimated by regressing relative exports of similar countries—by location, endowment, and facing the same trade barriers abroad—on relative time delays and other standard variables. Our results imply that on average, each additional day of delay reduces trade by at least 1%. We find a larger effect on time-sensitive agricultural and manufacturing products and on transit times abroad for landlocked countries.

The size of the effect suggests that a one-day reduction in delays before a cargo sails to its export destination is equivalent to reducing the distance to trading partners by about 70 kilometers. This may explain why Mauritius has enjoyed success as an exporter. At sixteen days to process cargo, the efficiency of its trade infrastructure is identical to that of the United Kingdom and better than France’s.

Our results have important implications for developing countries seeking to expand exports. The Doha trade negotiations have focused on import barriers in the United States and EU. However, since OECD tariffs are already quite low, estimates of increased exports by developing countries from a successful Doha Round are also relatively small—averaging about 2% (Amiti & Romalis, 2007). For the least developed countries, which already have preferential access, the benefits from additional market access are in some cases negative.15 In contrast, our estimates imply that reducing trade costs can have relatively large effects on exports. For example, in sub-Saharan Africa, it takes 48 days on average to get a container from the factory gate loaded on to a ship. Reducing export times by 10 days is likely to have a bigger impact on exports (expanding them by about 10%) of developing countries than any feasible liberalization in Europe or North America.16


Hummels, David, “Time as a Trade Barrier,” Purdue University mimeograph (2001).


REFERENCES


Hummels, David, “Time as a Trade Barrier,” Purdue University mimeograph (2001).


NOTES

15 Amiti and Romalis (2007) find African LDCs lose from MEN tariff reduction. Even for OECD agricultural reform, the global consequences would be “relatively small and highly uneven” (Rodrik, 2005).

16 Similarly, Hummels (2007) uses the export time data plus data on shipping times and tariffs and finds that tariff equivalents for export delays are greater than tariffs faced by developing country exporters.

I am tremendously grateful to three anonymous referees and Dani Rodrik, whose valuable suggestions and comments helped shape this paper. I am deeply indebted to John Campbell, Richard Caves, Win-Lin Chou, Oliver Hart, Simon Johnson, Rafael La Porta, Randall Morck, Dwight Perkins, Kenneth Rogoff, Andrei Shleifer, Jeremy Stein, Shang-Jin Wei, and seminar participants at the Harvard University and Western Finance Association annual meeting for their helpful advice, discussion, and comments. Financial support of the Research Grants Council of Hong Kong SAR (CUHK 4203/02H) is gratefully acknowledged.

INSTITUTIONAL QUALITY AND ECONOMIC CRISIS: LEGAL ORIGIN THEORY VERSUS COLONIAL STRATEGY THEORY

Julan Du*

Abstract—In a natural experiment among former colonies between 1970 and 1999, weak institutions reflected in high settler mortality and French legal origin often increase the likelihood and intensity of local currency and real crises (i.e., those resulting in a drop in real output) amid six global crises. The effects of institutions on crises are often mediated through macroeconomic policies, but they are often not primary channels. Persistent institutions (i.e., those reflected in the legal origins and settler mortality) predict the occurrence and intensity of crises better than time-varying institutions do.

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Chinese University of Hong Kong.

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I. Introduction

A growing literature has shown that weak institutions are the most fundamental reasons for serious economic crises. Rodrik (1997) finds that democracies are less volatile than nondemocratic regimes. Studies such as Johnson et al. (2000) demonstrate that weak institutions have deepened local crises in the Asian crisis. Acemoglu, Johnson, Robinson, and Thaicharoen (2003) show that former colonies that inherited more extractive institutions experienced more intensive growth volatility during the postwar period. However, existing studies, such as Johnson et al. (2000), focus mainly on the most recent Asian crisis.3 Furthermore, whether institutions help predict the occurrence of crises remains an unresolved issue. Earlier studies such as Furman and Stiglitz (1998) mainly adopted time-varying survey-based institution indices but found them to have no predictive power for the likelihood of crises.

Based on the three leading institutional theories of economic crises—legal origin theory, colonial strategy theory, and cultural theory—we employ legal origin, settler mortality, and religious composition (proportions of different religions’ followers in the population) as alternative measures of institutional quality. We conduct a natural experiment within former colonies to test whether institutions can predict the occurrence and intensity of local crises amid six global crises between 1970 and 1999: the two oil crises, the world debt crisis, the early 1990s recession, the Tequila crisis, and the Asian crisis. We focus on currency and real crises since they are easier to define, with reliable data and quantifiable criteria for former colonies. Legal origin theory asserts that common law created more effective constraints on executive power than did civil law (La Porta et al., 1999; Beck, Demirgüç-Kunt, & Levine, 2003), and, thus, former French colonies experience more frequent and intensive crises than do former British colonies. Colonial strategy theory emphasizes that European colonizers established better institutions in hospitable settler colonies than in inhospitable extractive colonies (Acemoglu, Johnson, & Robinson, 2001). Consequently, former colonies with lower settler mortality suffer crises less frequently and less deeply than do extractive colonies with higher settler mortality. Cultural theory argues that Protestantism does better in fostering a strong work ethic and interpersonal trust and, thus, adequate institutions, than do Catholicism and Islam (Landes, 1998; La Porta et al., 1999). Hence, we expect less frequent and less severe crises in Protestant countries than in Catholic and Muslim societies.

Inspired by the methodology of Beck et al. (2003), we make a first attempt to assess different institutional theories of crises. Sections III and IV demonstrate that religious composition does not produce consistently strong results. However, settler mortality and French legal origin predict crisis occurrence and intensity fairly well with the former exhibiting a little more consistent effects than does the latter. Former colonies with higher settler mortality more likely incur local currency and real crises in five and three global crises, respectively, while former colonies with French legal origin do so in two and two global crises, respectively. Countries with higher settler mortality suffer deeper currency and real crises during two and four global crises, respectively, whereas French legal origin ex-colonies do so amid one and three world crises, respectively. Section V compares persistent institutions (legal origin and settler mortality) and time-varying institutions (such as the autocracy index) and finds the former to perform much better in accounting for the likelihood and intensity of crises.

II. Data and Sample

Our natural experiment focuses on a sample of former colonies, which helps generate exogenous measures of institutions. According to Beck et al. (2003), legal traditions could be endogenous in their birthplaces, but they are exogenous in former colonies because what colony obtained what legal origin through colonization is largely a coincidental event. Former colonies have either British or French legal origin. Our analysis also assesses whether institutions affect crises through macroeconomic policies. Using data from World Development Indicators, we experiment with many macroeconomic policy variables, including those most widely used in the literature, such as real exchange rate depreciation, government consumption/GDP (as a proxy for government size), inflation, international reserves and imports, and current account balance/GDP.1 According to Acemoglu et al. (2003), given that institutions are significant when they are the only independent variables, we can interpret regressions including both institutions and policies in the following way. If institutions lose significance or diminish substantially in significance or magnitude while macroeconomic variables are significant, institutions affect crises primarily through the mediating channels of macroeconomic policies. If both institutions and macroeconomic variables are significant, both can have independent effects on crises, and some of the effects of institutions may be channeled by macroeconomic policies. If institutions continue to be statistically significant but macroeconomic variables do not, macroeconomic policies are not important mediating channels.

We do not include continent dummies such as sub-Saharan Africa and Latin America because they mainly reflect the omitted institutional factors (La Porta et al., 1999), or they may confound our tests without providing a clear alternative theory (Beck et al., 2003).4 Case studies of six global crises make an international comparison more powerful. Local crises occurring amid world crises are most likely triggered by global shocks; this minimizes the impact of country-specific shocks and puts international comparisons on a common ground. Moreover, as argued by Rodrik (1998) and Acemoglu et al. (2003), almost all countries may go through some initial shocks in global crises. However, in institutionally weak societies, the initial shocks give rise to intensified social conflicts that cause massive economic volatility, whereas institutionally strong societies may withstand the initial shocks and recover quickly.


1 Acemoglu et al. (2003) examine the period 1970–1999, but they do not explicitly identify local and global crises and examine the predictive power of institutions for the occurrence of crises.

2 Our sample of 69 former colonies is broadly the same as that in Beck et al. (2003) except that Zaire is excluded due to lack of compatible macroeconomic data.

3 Acemoglu et al. (2003) examine the first three macroeconomic policy variables.

4 Our results are qualitatively equivalent if continent dummies are included, though the statistical significance of institutions is a bit weaker in certain parts of our analysis.

5 The world debt crisis continued until the mid-1990s. However, with a debt reduction package negotiated in 1989, debtor countries’ economic conditions had improved dramatically by 1990 (Gillis et al., 1996). To
1990–1992 for the early 1990s recession, 1994–1995 for the Tequila crisis, and 1997–1998 for the Asian crisis. For each crisis, we set up a crisis window that consists of the core crisis years and one year prior to and one year following the core crisis years. Including one year following the core crisis years helps allow country-specific factors that may protract local crises.6

### III. Institutions and Crisis Prediction

We employ one widely accepted definition of a currency crisis with a quantifiable criterion applicable to a large sample of countries: the value of local currency declines by at least 25% in a particular year; also this drop must exceed the previous year’s exchange rate depreciation by a margin of at least 10% (Frankel & Rose, 1996). Currency depreciation is usually calculated with reference to the nominal bilateral U.S. dollar exchange rate. To allow countries to have different response speeds to global shocks, we identify a country as incurring a currency crisis if the currency depreciation satisfies the above criterion in at least one year from the first core crisis year to the end of the crisis window.

Keeping to the spirit of many popular definitions of recessions and constrained by the lack of reliable high-frequency (quarterly) real GDP statistics for developing countries, we define a real crisis as the local currency real GDP per capita growth rate being negative during one year. Similarly, a local real crisis takes place amid a global crisis if this criterion is satisfied in at least one year from the first core crisis year to the end of the crisis window.

In the appendixes that are available in the Supplemental Content section of the journal Web site, we present probit regressions to investigate the importance of institutions in causing crises (see http://www.mitpressjournals.org/doi/suppl/10.1162/rest.2009.9880). In terms of currency crises, former colonies with higher settler mortality were more likely to incur currency crises in all global crises except the first oil crisis. Former colonies with a French legal origin were more likely to do so in the second oil crisis and the Tequila crisis. Protestantism reduced currency crisis likelihood in the first oil crisis and the Asian crisis, and Catholicism increased it in the world debt crisis and the early 1990s recession. Real crises produced similar results. Former colonies with higher settler mortality were more vulnerable to real crises during the second oil crisis, the early 1990s recession, and the Tequila crisis, while colonies with French legal origin were more prone to real crises in the world debt crisis and the Tequila crisis. Religious composition produced mostly unexpected or insignificant results.7

Then we add macroeconomic variables to regressions. Various mismanaged macroeconomic policies often mediate the impacts of institutions on crisis likelihood, but they mostly serve as partial rather than full mediating channels. Such a pattern is observed in the case of crisis intensity examined in section IV. For example, in the real crisis amid the Tequila crisis, real exchange rate overvaluation mediated the impact of French legal origin fully and that of settler mortality partially. In the currency crisis amid the second oil crisis, excessive credit growth partially mediated the effects of

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6 Because various global crises tend to follow each other, including more years following the core crisis years, though ideal theoretically, may result in a mingling of two different crises.

7 Including the “oil-exporting country” dummy does not show oil exporters to fare better in oil crises.

---

9 The regression results remain qualitatively equivalent when different types of institutions serve as the lone independent variable separately.

10 Owing to incomplete data on some macroeconomic policy variables, sample size is somewhat reduced.

### IV. Institutions and Crisis Intensity

To fully capture the cross-country variation in responses to global shocks, we identify the trough year and the preceding peak year for the local currency value (real GDP per capita) within each crisis window for each country. We use the annual average percentage change in local currency value (real GDP per capita) from the peak year to the trough year to measure the severity of currency (real) crises.8

We find no strong relationships between institutional quality and exchange rate depreciation in the six global crises. This exhibits the limitations of exchange rate depreciation as a crisis intensity measure. The fixed exchange rate regime broke down in leading industrial countries in the 1970s, but most developing countries, including most of the former colonies, adhered to either adjustable-peg or crawling-peg systems where governments were still committed to a virtual fixed parity (Gillis et al., 1996). Therefore, instead of currency depreciation, we use the average annual rate of decline in international reserves to measure crisis intensity under a fixed or quasi-fixed exchange rate regime. The larger the devaluation pressure, the more reserves the government has to draw down in order to stabilize the local currency value.

Table 1 presents regressions examining the importance of institutions in shaping the depth of a currency crisis.9 In part 1 of the table, statistically significantly more drastic reserve losses occur in former colonies with higher settler mortality amid the two oil crises and in those with French legal origin during the Asian crisis. Religious composition shows no strong results except that Protestantism is associated with a milder reserve loss during the second oil crisis. After introducing macroeconomic variables in part 2 of table 1, we find that inflation serves as a primary mediating channel for settler mortality in the first oil crisis. Insufficient reserves partially mediate the effects of Protestantism and settler mortality in the second oil crisis.10

The effects of institutions are most salient in the two oil crises. At that time, the fixed exchange rate regime had just started to break down, and various countries drew down reserves to bolster their fixed exchange rates. Later, many countries adopted a more flexible exchange rate, which weakened the effectiveness of reserve losses in gauging the intensity of the currency crisis. In addition, we follow Glick and Rose (1999) and combine, by experimenting with different weighting schemes, the decline in reserves and that in exchange rates to construct a comprehensive measure of currency crisis intensity, but we obtain no strong results.

Table 2 demonstrates the impact of institutions on the severity of real crises. In part 1 of the table, former colonies with higher settler mortality suffered deeper real crises during the two oil crises, the early 1990s recession, and the tequila crisis. Similarly, those with French legal tradition suffered more severe real crises in the world debt crisis, the early 1990s recession and the Tequila crisis. The results lend no support to the cultural theory. Part 2 of the table introduces macroeconomic variables. High inflation partially mediated the impact of settler mortality in the first oil crisis.
Table 1.—Institutional Quality and Local Currency Crisis Intensity in Six Global Crises

<table>
<thead>
<tr>
<th>Part 1</th>
<th>Log of Settler Mortality</th>
<th>French Legal Origin</th>
<th>Protestant</th>
<th>Catholic</th>
<th>Muslim</th>
<th>Number of Observations</th>
<th>Adjusted R²</th>
</tr>
</thead>
<tbody>
<tr>
<td>First oil crisis</td>
<td>0.086***</td>
<td>−0.085</td>
<td>0.075</td>
<td>−0.063</td>
<td>0.050</td>
<td>65</td>
<td>0.074</td>
</tr>
<tr>
<td>Second oil crisis</td>
<td>0.076***</td>
<td>−0.15</td>
<td>−0.074</td>
<td>0.005</td>
<td>0.004</td>
<td>66</td>
<td>0.022</td>
</tr>
<tr>
<td>World debt crisis</td>
<td>0.031</td>
<td>−0.24</td>
<td>0.045</td>
<td>0.055</td>
<td>0.055</td>
<td>68</td>
<td>0.052</td>
</tr>
<tr>
<td>Early 1990s recession</td>
<td>0.019</td>
<td>0.49</td>
<td>2.03**</td>
<td>0.097</td>
<td>0.097</td>
<td>69</td>
<td>0.10</td>
</tr>
<tr>
<td>Tequila crisis</td>
<td>−1.61</td>
<td>−5.89</td>
<td>8.75</td>
<td>12.22</td>
<td>10.48</td>
<td>69</td>
<td>0.022</td>
</tr>
<tr>
<td>Asian crisis</td>
<td>0.021</td>
<td>0.11*</td>
<td>0.18</td>
<td>−0.20</td>
<td>−0.095</td>
<td>69</td>
<td>0.014</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Part 2</th>
<th>Log of Settler Mortality</th>
<th>French Legal Origin</th>
<th>Protestant</th>
<th>Catholic</th>
<th>Muslim</th>
<th>Real Exchange Rate Depreciation</th>
<th>Credit Growth Rate</th>
<th>Government Consumption/GDP</th>
<th>International Reserves Sufficiency</th>
<th>Current Account Balance/GDP</th>
<th>Inflation Rate</th>
<th>Number of Observations</th>
<th>Adjusted R²</th>
</tr>
</thead>
<tbody>
<tr>
<td>First oil crisis</td>
<td>0.055</td>
<td>0.14</td>
<td>0.47</td>
<td>−0.30</td>
<td>−0.0047</td>
<td>0.12</td>
<td>0.42</td>
<td>−0.34</td>
<td>0.79**</td>
<td>0.18</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Second oil crisis</td>
<td>0.12**</td>
<td>−0.13</td>
<td>−1.25**</td>
<td>0.063</td>
<td>−0.078</td>
<td>−0.057</td>
<td>0.022</td>
<td>0.99</td>
<td>−0.43**</td>
<td>0.35</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Debt crisis</td>
<td>0.028</td>
<td>0.097</td>
<td>0.087</td>
<td>0.086</td>
<td>−0.076</td>
<td>0.051</td>
<td>−0.64</td>
<td>0.15**</td>
<td>−0.23</td>
<td>−0.14</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Early 1990s recession</td>
<td>0.057</td>
<td>0.18</td>
<td>1.01</td>
<td>0.25</td>
<td>−0.35</td>
<td>−0.34</td>
<td>−0.47</td>
<td>4.14**</td>
<td>0.42</td>
<td>−0.44</td>
<td>−0.28**</td>
<td>59</td>
<td>0.21</td>
</tr>
<tr>
<td>Tequila crisis</td>
<td>−0.98</td>
<td>−7.88</td>
<td>25.81</td>
<td>17.82</td>
<td>16.06</td>
<td>6.20</td>
<td>−0.14</td>
<td>−43.36</td>
<td>12.06</td>
<td>22.78</td>
<td>−0.47</td>
<td>59</td>
<td>0.017</td>
</tr>
<tr>
<td>Asian crisis</td>
<td>0.012</td>
<td>0.099</td>
<td>0.37</td>
<td>−0.18</td>
<td>−0.094</td>
<td>−0.29</td>
<td>−0.11</td>
<td>−0.10</td>
<td>0.049</td>
<td>0.31</td>
<td>−0.16</td>
<td>62</td>
<td>0.098</td>
</tr>
</tbody>
</table>

Note: The dependent variable is the annual average rate of decline in international reserves. Macroeconomic variables take the value for the first year of each crisis window. International reserve sufficiency is international reserves and imports except for the world debt crisis episode, where it is the ratio of foreign debt to international reserves to capture the impact of foreign debt. Regressions are estimated using OLS estimation. Robust standard errors are given in parentheses. Constant terms are included in the regressions but not reported to save space. Some macroeconomic variables are dropped in some regressions to avoid a too small sample size or multicollinearity. A list of sample countries in regressions for each crisis episode is included in the appendix in the Supplemental Content section of this journal’s Web site. *Significant at 10%. **Significant at 5%.

and fully channelled the effects of French legal origin in the world debt crisis. The effects of settler mortality were partially mediated through overvalued real exchange rate in the second oil crisis. Reserve inadequacy mediated the effects of settler mortality partially and those of French legal origin fully in the early 1990s recession.

The effects of institutions are economically significant. Based on the estimated coefficient of log settler mortality in the first oil crisis (0.086) in part 1 of table 1, a one-standard-deviation increase in the logarithm of mortality rates (1.24), which is roughly the move from Colombia, Kenya, Niger, and Togo to Congo, Madagascar, Gambia, and Mali, respectively, raises the annual average rate of decline in reserves by 10.7 percentage points in the first oil crisis. The mean and standard deviation of the reserve decline rate in the first oil crisis is 16% and 32%, respectively. For instance, if Madagascar had the same mortality rate as Kenya does—Madagascar’s logarithm of settler mortality dropped from 6.28 to 4.98—the annual average rate of decline in reserves of Madagascar (23.8%) would have declined to 12.6%, which is very close to that of Kenya (12.8%). Similar patterns are observed for the other pairs of former colonies mentioned above.

In the world-debt-crisis-induced real crises, French legal origin has an estimated coefficient of 0.026 in part 1 of table 2, suggesting that if Costa Rica had a common law legal tradition, its high rate of output decline (5%) would be substantially lowered, even below that of United States (3%).

V. Persistent versus Time-Varying Institutions

Settler mortality and legal origin represent persistent institutions. This section compares the importance of persistent and time-varying institutions in predicting crises.11

Applying the criteria in defining currency or real crises (as in Section III) to each country in each year from 1970 to 1999, we construct a currency (real) crisis dummy variable taking a value of 1 for a country in a year if a currency (real) crisis occurs and 0 otherwise. To avoid counting the same crisis twice, we follow the literature by setting the data missing for the two years following a crisis year. Part of our analysis focuses on global-recession-induced local crises. Because world output has maintained positive growth, global recession years are defined as those with a decline in world output growth rate from the preceding year: the years 1970, 1971, 1974, 1975, 1977, 1979, 1980–1982, 1986, 1989, 1990, 1991, 1995, and 1998.12 This method captures all the widely recognized global recession years. We stack up the crisis dummy variables for the thirty years and the global recession years to form a combined time series and cross-section data set, and conduct

11 Because religious compositions are largely stable over time and we lack exact data on them in each country in each year, we treat them as time invariant.

12 Local crises in each year are the same as in the above case without identifying global-recession-induced crises, that is, we count only local crises starting in global recession years.
probit regressions to see how persistent and time-varying institutions help predict crises.

We experiment with many different time-varying institution indices and present three of them: the index of executive constraints and the index of autocracy from Polity IV, where a higher score means more constraints on chief executives and a higher level of autocracy respectively, and the corruption index (1984–1999 only) compiled by the International Country Risk Guide (ICRG), where a higher score indicates less severe government corruption.13 These indices are lagged one year in regressions. We estimate standard errors by clustering around country groups to avoid a too small sample size or multicollinearity. List of sample countries in regressions for each crisis episode is included in the appendix in the Supplemental Content section of this journal’s Web site.

Table 3 shows that former colonies with higher settler mortality more likely experience both local currency and real crises, while former colonies with French legal origin more likely suffer real crises. Former colonies with more prevalent Protestant cultures have less frequent global-recession-induced currency crises. The time-varying institution indices display no strong effects except that former colonies with less corruption are less likely to suffer global-recession-induced currency crises.

Table 4 summarizes the performance of persistent and time-varying institutions in predicting the likelihood and intensity of local crises in the six global crisis episodes. Persistent and time-varying institutions are put into regressions separately or together. Persistent institutions produce strong results in many more crisis episodes than do time-varying institutions. Only in the crisis occurrence prediction during the Asian crisis does the time-varying corruption index show strong results. Time-varying institutions often generate no strong results even in regressions without including persistent institutions. In some cases, time-varying institutions lose statistical significance once they are put together with persistent institutions.

There are several plausible reasons for the stronger explanatory power of persistent institutions. First, many changes in political institutions such as democratization alter only the distribution of de jure political power;14 the elites can keep their de facto political power;14 the time-varying indices such as the indices of executive constraints and autocracy largely capture the changes in political institutions that alter fundamental components of institutional variation that influence political stability. Second, institutions are multidimensional, but each time-varying institution index typically focuses on only one dimension in an imperfect manner, and we cannot exhaust all these dimensions. Persistent institution indices capture the historically determined fundamental components of institutional variation that influence stable decision-making and policy making.

13 The results for other indices are qualitatively equivalent to these three.

14 The time-varying indices such as the indices of executive constraints and autocracy largely capture the changes in political institutions that alter the de jure distribution of political power.
corporate various dimensions more comprehensively (Acemoglu et al., 2003).

Finally, the time-varying institution indices on political regimes or corruption are often subjective measures based on polls and surveys. Although this is probably the most feasible way to measure them (Kaufmann, Kraay, & Mastruzzi, 2006), these perception-based indicators are likely subject to various problems such as measurement errors and attitudinal bias (Donchev & Ujhelyi, 2007; Urra, 2007), which causes

class clustering around country groups. Average marginal effects on the probability of the dependent dummy variable taking value 1 are reported. Constant terms and year dummy variables are included in the regressions

TABLE 4.—PERSISTENT INSTITUTIONS VERSUS TIME-VARYING INSTITUTIONS IN PREDICTING CRISIS LIKELIHOOD AND INTENSITY AMID SIX GLOBAL CRISES:

A SUMMARY OF RESULTS

<table>
<thead>
<tr>
<th>Currency Crisis Prediction</th>
<th>Real Crisis Prediction</th>
</tr>
</thead>
<tbody>
<tr>
<td>First oil crisis</td>
<td>NW</td>
</tr>
<tr>
<td>Second oil crisis</td>
<td>NW</td>
</tr>
<tr>
<td>Debt crisis</td>
<td>NW</td>
</tr>
<tr>
<td>1990s recession</td>
<td>NW</td>
</tr>
<tr>
<td>Tequila crisis</td>
<td>NW</td>
</tr>
<tr>
<td>Asian crisis</td>
<td>NW</td>
</tr>
<tr>
<td>Currency Crisis Depth</td>
<td>NW</td>
</tr>
<tr>
<td>Real Crisis Depth</td>
<td>NW</td>
</tr>
</tbody>
</table>

Note: Y: The persistent (time-varying) institution indicator has statistically significant estimated coefficient with the expected sign in regressions without time-varying (persistent) institutions. N: The estimated coefficient of the persistent (time-varying) institution indicator is either statistically insignificant or has unexpected sign, or both, in regressions including both time-varying and persistent institutions. R: The institution indicator has a statistically significant estimated coefficient with the expected sign in regressions including both time-varying and persistent institutions. W: The estimated coefficient of the persistent (time-varying) institution indicator is either statistically insignificant or has unexpected sign, or both, in regressions without time-varying (persistent) institutions.

Table 3.—Persistent Institutions versus Time-Varying Institutions in Predicting Crisis Likelihood

<table>
<thead>
<tr>
<th>Log of Settlement Mortality</th>
<th>French Legal Origin</th>
<th>Executive Constraint Index</th>
<th>Autocracy Index</th>
<th>ICRG Corruption Index</th>
<th>Protestant</th>
<th>Catholic</th>
<th>Muslim</th>
<th>Number of Observations</th>
<th>Log Likelihood (p-value)</th>
<th>Pseudo-$R^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Panel 1: Predicting Currency Crises</td>
<td>0.028**</td>
<td>−0.016</td>
<td>0.0012</td>
<td>−0.079</td>
<td>0.048</td>
<td>−0.063</td>
<td>1,498</td>
<td>−370.66</td>
<td>0.16</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.0084)</td>
<td>(0.027)</td>
<td>(0.0043)</td>
<td>(0.084)</td>
<td>(0.050)</td>
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<td>0.028**</td>
<td>−0.013</td>
<td>−0.0019</td>
<td>−0.073</td>
<td>0.045</td>
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<td>1,498</td>
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<td>(0.0080)</td>
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<td>(0.0029)</td>
<td>(0.083)</td>
<td>(0.051)</td>
<td>(0.055)</td>
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<td>0.037**</td>
<td>−0.057</td>
<td>−0.0092</td>
<td>−0.035</td>
<td>0.11</td>
<td>−0.054</td>
<td>721</td>
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<td></td>
<td>(0.013)</td>
<td>(0.045)</td>
<td>(0.011)</td>
<td>(0.12)</td>
<td>(0.069)</td>
<td>(0.080)</td>
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<tr>
<td>Panel 2: Predicting Real Crises</td>
<td>0.063</td>
<td>0.14**</td>
<td>0.012</td>
<td>0.42**</td>
<td>−0.021</td>
<td>0.020</td>
<td>1,168</td>
<td>−614.09</td>
<td>0.082</td>
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<tr>
<td></td>
<td>(0.013)</td>
<td>(0.055)</td>
<td>(0.0081)</td>
<td>(0.13)</td>
<td>(0.12)</td>
<td>(0.10)</td>
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<tr>
<td></td>
<td>0.060**</td>
<td>0.13**</td>
<td>−0.0076</td>
<td>0.43**</td>
<td>−0.026</td>
<td>0.020</td>
<td>1,168</td>
<td>−614.09</td>
<td>0.081</td>
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<td></td>
<td>(0.013)</td>
<td>(0.055)</td>
<td>(0.0058)</td>
<td>(0.13)</td>
<td>(0.11)</td>
<td>(0.10)</td>
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<td></td>
<td>0.046**</td>
<td>0.13*</td>
<td>0.0050</td>
<td>0.39*</td>
<td>0.00010</td>
<td>0.023</td>
<td>620</td>
<td>−322.97</td>
<td>0.068</td>
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<tr>
<td></td>
<td>(0.021)</td>
<td>(0.065)</td>
<td>(0.019)</td>
<td>(0.20)</td>
<td>(0.12)</td>
<td>(0.11)</td>
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<tr>
<td>Panel 3: Predicting Currency Crises Induced by Global Recessions</td>
<td>0.014*</td>
<td>0.0032</td>
<td>−0.0023</td>
<td>−0.17*</td>
<td>0.049</td>
<td>−0.021</td>
<td>765</td>
<td>−717.81</td>
<td>0.16</td>
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<tr>
<td></td>
<td>(0.0085)</td>
<td>(0.030)</td>
<td>(0.0047)</td>
<td>(0.10)</td>
<td>(0.051)</td>
<td>(0.055)</td>
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<td></td>
<td>0.014*</td>
<td>0.0020</td>
<td>0.00020</td>
<td>−0.18*</td>
<td>0.052</td>
<td>−0.021</td>
<td>765</td>
<td>−717.73</td>
<td>0.16</td>
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<tr>
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<td>(0.0079)</td>
<td>(0.030)</td>
<td>(0.0034)</td>
<td>(0.11)</td>
<td>(0.051)</td>
<td>(0.054)</td>
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<tr>
<td></td>
<td>0.019</td>
<td>−0.12*</td>
<td>−0.030*</td>
<td>−0.23</td>
<td>0.16</td>
<td>−0.012</td>
<td>291</td>
<td>−92.44</td>
<td>0.083</td>
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<td></td>
<td>(0.021)</td>
<td>(0.072)</td>
<td>(0.018)</td>
<td>(0.24)</td>
<td>(0.091)</td>
<td>(0.11)</td>
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<tr>
<td>Panel 4: Predicting Real Crises Induced by Global Recessions</td>
<td>0.043*</td>
<td>0.13*</td>
<td>0.00071</td>
<td>0.41**</td>
<td>−0.087</td>
<td>−0.10</td>
<td>610</td>
<td>−331.32</td>
<td>0.082</td>
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<td></td>
<td>(0.018)</td>
<td>(0.069)</td>
<td>(0.011)</td>
<td>(0.19)</td>
<td>(0.14)</td>
<td>(0.14)</td>
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<tr>
<td></td>
<td>0.048**</td>
<td>0.14**</td>
<td>−0.0070</td>
<td>0.44**</td>
<td>−0.10</td>
<td>−0.093</td>
<td>610</td>
<td>−330.70</td>
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<td>(0.016)</td>
<td>(0.066)</td>
<td>(0.0071)</td>
<td>(0.19)</td>
<td>(0.14)</td>
<td>(0.14)</td>
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<td></td>
<td>0.075</td>
<td>0.14*</td>
<td>−0.0093</td>
<td>0.32</td>
<td>−0.20</td>
<td>−0.18</td>
<td>257</td>
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<td>(0.022)</td>
<td>(0.069)</td>
<td>(0.028)</td>
<td>(0.27)</td>
<td>(0.13)</td>
<td>(0.14)</td>
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Note: The dependent variable is the currency or real crisis dummy variable in the period 1970–1999. Regressions are estimated using maximum likelihood Probit estimation. Standard errors are estimated by clustering around country groups. Average marginal effects on the probability of the dependent dummy variable taking value 1 are reported. Constant terms and year dummy variables are included in the regressions but not reported to save space. In each panel, the sample size may vary across different specification due to the constraint of data availability. *Significant at 10%. **Significant at 5%.
disparities between perceived institutions and actual institutions and thus weakens their power in measuring institutional quality and predicting the likelihood and intensity of crises.

VI. Conclusion

This paper complements Acemoglu et al. (2003) by demonstrating the importance of institutions, especially persistent institutions, in six global crisis episodes. It suggests that strengthening institutions helps reduce the likelihood and intensity of economic crises. The effects of institutions on crises are often mediated through mismanaged macroeconomic policies. However, macroeconomic policy mistakes are often not primary mediators of crises. Across crises episodes, which suggests the presence of many other channels, including microeconomic ones.16

REFERENCES


15 Various robustness tests (such as changing crisis criteria), other detailed results (such as those for section 3 and table 4), data summary, figures, and other material are in the appendixes in the Supplemental Content section of this journal’s Web site.

16 Our findings on the role of macroeconomic policies in economic crises are largely consistent with those of Acemoglu et al. (2003).

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FRIEND OR FOE? COOPERATION AND LEARNING IN HIGH-STAKES GAMES

Felix Oberholzer-Gee, Joel Waldfogel, and Matthew W. White*

Abstract—Why do people frequently cooperate in defiance of their immediate incentives? One explanation is that individuals are conditionally cooperative. As an explanation of behavior in one-shot settings, such preferences require individuals to be able to discern their opponents’ preferences. Using data from a television game show, we provide evidence about how individuals implement conditionally cooperative preferences. We show that contestants forgo large sums of money to be cooperative; they cooperate at heightened levels when their opponents are predictably cooperative; and they fare worse when their observable characteristics predict less cooperation because opponents avoid cooperating with them.

I. Introduction

In recent years, economists have endeavored to explain why individuals frequently cooperate in competitive situations. Early work emphasizes reputation and reciprocity in the context of repeated games (Kreps & Wilson, 1982). More recently, theorists and experimentalists have turned their attention to norms and preferences as explanations of cooperative behavior. Rabin (1993) posits that individuals have conditionally cooperative preferences: they like to cooperate with those who are cooperative but punish those who are not. In theory and experiments, models with conditionally cooperative players explain behavior in a fairly wide range of games (Fehr & Schmidt, 1999; Bolton & Ockenfels, 2000; Charness & Rabin, 2002). As an explanation without repeated interaction, however, condition...