

THREE ESSAYS ON FINANCIAL CRISES, FOREIGN DIRECT INVESTMENT AND
CROSS-NATIONAL COORDINATION

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ABSTRACT

The first two chapters of this dissertation examine the evolution of foreign direct investment (FDI) inflows to developing countries around financial crises. In the first chapter, I empirically and thoroughly examine the Fire-Sale FDI hypothesis and describe the pattern of FDI inflows surrounding financial crises. I add a more granular detail about the types of crises and their potentially differential effects on FDI. Moreover, I distinguish between Mergers and Acquisitions (M&A) and Greenfield investment, as well as between different motivations for FDI—horizontal and vertical. The results indicate that financial crises have a strong negative effect on inward FDI in developing countries. Crises are also shown to reduce the value of horizontal and vertical FDI. I do not find empirical evidence of Fire-Sale FDI. On the contrary, financial crises are shown to affect FDI flows and M&A activity negatively.

In the second chapter, I focus my analysis of FDI on the members of the Association of South East Asian Nations (ASEAN). I analyze historical data on ASEAN inward FDI in the context of the Asian financial crisis (AFC) and the 2008 economic downturn and present new data on ASEAN FDI cycles following the 1997 crisis relative to historical crises incidences. Empirically examining the effects of the AFC on ASEAN, I compare them to the historical averages for the Asian region as well a broad sample of forty developing countries. Distinguishing between the different types of crises and FDI, I find that AFC had a negative and relatively large effect on ASEAN FDI, as compared with historical averages.

Finally, the third chapter uses an experimental approach to study whether nationality serves as a coordination device in a cross-national economic experiment. The

results show that nationality serves as a coordination device if common nationality is the only piece of information available to the subjects. However, providing participants with additional information about their partner diminishes this effect. I also find that subjects are likely to coordinate on the Pareto-dominant equilibrium at about the same rate if the partner has a different nationality than if nationality is unknown.

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Chapter 1: Fire-Sale FDI? The Impact of Financial Crises on Foreign Direct Investment

1. Introduction

Paul Krugman, in a much cited paper on the Asian 1997-8 crisis, starts by arguing that: “hard statistical evidence of a surge in FDI into Asia was not yet available” but that anecdotal evidence strongly suggests an inflow of FDI in the post-crisis period (Krugman, 2000, p. 44). The idea that financial crises are sometime also accompanied by Fire-Sale FDI (the title of Krugman’s paper) caught on. Krugman concludes his paper, written sometime in 1998, noting that: “What we need—surprise—is more research.” I believe this is still the case. There is very little empirical research that attempts to systematically document the evolution of foreign direct investment around financial crises.¹ This is what I do in this chapter.

The importance of foreign direct investment (FDI) to the global economy in the last two decades is quite obvious, with increasing volumes of FDI flowing between, into and more recently from the developing countries and emerging markets (see Table 1). In 2010, for the first time, developing and transition economies together attracted more than half of global FDI inflows (UNCTAD World Investment Report 2010). Even though the theoretical literature in economics has identified several channels through which FDI inflows are predicted to benefit the receiving economy, the empirical literature has lagged behind and has had more trouble identifying these advantages in practice.

¹ Notable exceptions are Aguiar and Gopinath (2005) who measure the increase in foreign firms’ M&A activity during the Asian crisis, and Acharya et al. (2011) who provide a theoretical background to the empirical insights provided by the former paper about the effect of the Asian currency crises. UNCTAD (2000) describes some of the underlying data.

Notwithstanding these uncertain empirical observations, most countries continue to vigorously pursue policies aimed at encouraging more FDI inflows.

While much of the literature focuses on the impact of FDI on technological transfer, increasing productivity and production and export upgrading, one frequently identified advantage of FDI flows is its perceived stability relative to other types of capital flows. Empirical research shows that FDI flows tend to be much less volatile than equity flows or bank lending, for example (Osei et al., 2002). A related and intriguing hypothesis is that, unlike other types of capital flows, FDI tends to ‘lean against the wind’ and inflows may rush in during a financial crisis, when all other types of capital are fleeing the scene.

In this chapter, I analyze the pattern of FDI inflows to emerging and developing countries focusing on the impact of financial crises on these flows. I contribute in several ways. This is the first paper to empirically and thoroughly examine the Fire-Sale FDI hypothesis and describe the pattern of FDI inflows surrounding financial crises. I further contribute by adding more granular detail about the types of financial crises and their potentially differential effects on FDI—this was after all the subject of Krugman’s (2000) paper, in which he analyzed the predictions of various theoretical crisis models on the viability of FDI. I also expect differing types of FDI to react differently to financial turmoil, and I therefore distinguish between different types of FDI—i.e., Mergers and Acquisitions (M&A) and Greenfield investments—and between different motivations for FDI—horizontal (tariff jumping) and vertical (integrating production stages).

Below I describe the hypotheses that I investigate in some detail, and do so within the context of the few papers that have looked at these questions. Section 3 presents the

data on the various types of FDI, the typology of financial crises I use, the empirical model, and the estimation methodology. Section 4 analyzes the results and discusses these results within the context of the ongoing global crisis that started in September 2008.

2. Different Crises, Different FDI, and Different Impacts

2.1 A Typology of Financial Crises and their Impacts

Since the re-emergence of financial turmoil during the 1970s, the economic literature on the topic has developed rapidly. The literature initially focused on currency crises, the mainstay of the 1970s turmoil, but later on also investigated banking crises, periods of high or hyper-inflation, and the debt crises of the 1980s, and finally in the 1990s, crises of capital flow reversals (the so-called Sudden Stops). FDI emerged on the international scene in significant amount only in the 1980s², so I use data for 1987-2009, and examine the various types of financial crises that were all present during this time period.

The two early generations of the theoretical currency crisis literature emphasized different fundamental reasons for a crisis. The first-generation models emphasized fiscal sustainability and the inevitability of crisis given fiscal policy choices (Krugman, 1979, Flood and Garber, 1984 and Burnside et al., 2001). In these models, the exchange rate peg is dropped during the crisis and the exchange rate continues to depreciate so long as the government continues to monetize its deficit. There is no real exchange rate change and therefore incentives for embarking on FDI projects do not change. The second generation of this literature, however, emphasizes multiple equilibria, and implies that

² FDI was also prevalent in the pre-WWI colonial era, but the statement is true for the post-WWII period.

crisis equilibrium may entail new opportunities for foreign direct investment since the real exchange rate depreciation is not necessarily related to a cyclical deterioration of the economy but potentially to shifts in expectations (e.g., Obstfeld, 1994, Drazen and Masson, 1994, Chamley, 2003).

The decade following the Asian crisis of 1997-8 yielded a new crop of crisis modeling, with many models emphasizing the importance of moral hazard created by government guarantees (Corsetti et al., 1999 and Dooley, 2000). These models largely imply a collapse of an over-investment bubble, and therefore very weak incentives for FDI in the crisis aftermath. A separate group of crisis models emphasize Diamond-Dybvig type banking runs and the breakdown in financial intermediation (e.g., Chang and Velasco, 2001, Uhlig, 2010); these, like the second generation currency crisis literature, may present opportunities for FDI.

A different crop of theory papers emphasize the reversals of capital flows ('Sudden Stops' as coined by Calvo, 1998) and their impact on the domestic economy. Sudden stops have been found to lead to dramatic if temporary output contractions especially if they involve a Fisherian debt deflation cycle (e.g., Hutchison and Noy, 2006, Mendoza, 2010). In these cases, the deep recession will likely weaken the incentives of foreign investors to enter the domestic market, and therefore these crises are predicted to reduce horizontal FDI. The possible impact of debt crises and the accompanying debt defaults are more difficult to characterize, since the impact of debt defaults is not well established (e.g., Rose, 2005). Even less well known are the differences in the macroeconomic consequences of domestic versus foreign debt defaults/crises.

I follow Krugman in arguing that in order to formulate a clear hypothesis on the impact of financial crises on FDI, one needs to understand the fundamental mechanisms that cause and shape the evolution of financial crises in the first place. In empirical terms, this means we need to control for the type of crisis a country experiences when evaluating the crisis impact on FDI. This is the first paper to have attempted to do that.

2.2 Types of FDI and their Vulnerability to Financial Crises

As we have already observed, financial crises that are caused by different phenomena are predicted to have different consequences for the domestic economy. In particular, some will lead to domestic contractions (maybe even deep recessions), while others may lead to an expansionary depreciation. Equally, a financial/monetary crisis may not have much impact on the real economy and therefore fail to affect the incentives faced by international investors. These different outcomes will potentially also impact distinctively the differing forms of direct investment; with the relative attractiveness of investing in existing infrastructure, through M&A, relative to constructing new production facilities (greenfield investment) may be shifting as well.

These distinctions also relate to the different time horizons that M&A and greenfield investment entail. M&A can typically be implemented much more quickly, since it does not entail a time-consuming permitting stage that typically accompanies new projects (especially in emerging markets). If a crisis is predicted to be short-lived, and especially if a real depreciation is perceived to be temporary, an M&A boom, as compared to an increase in greenfield investment, is likely to be observed.

Following the literature, I also distinguish between horizontal and vertical FDI (Aizenman and Marion, 2004). I examine the hypothesis that the differences between the motivations for FDI also matter for their vulnerability to financial crises. Horizontal FDI targets the domestic market (or maybe neighboring markets), so that a financial crisis that entails a real contraction will adversely affect horizontal FDI. Vertical FDI, on the other hand, is mostly concerned with production costs (and production quality); in this case a real depreciation may be very beneficial for integrating production networks vertically by reducing the costs associated with this process, whatever the state of the domestic/host economy is and will likely remain. Vertical FDI is also more closely associated with increased trade, and therefore can also be affected by the impacts of financial crises on trade relations (Aizenman and Noy, 2006 and 2009).

Empirically, I employ a country-panel regression approach using Arellano-Bond Generalized Method of Moments estimation (AB-GMM). AB-GMM is by now the standard in the international macro literature that uses country time series panels and I therefore do not include a detailed discussion of the estimation algorithm and its justification. It is worth noting that the algorithm enables us to disregard the time-invariant institutional, legal and cultural environment in which FDI projects are implemented and which may have an important impact on FDI inflows, and also deals with some types of endogeneity (though at least reverse causality is not a major concern in this case as few view FDI as potentially destabilizing for the financial system).

2.3 Relevant Previous Empirical Work on FDI

Beyond the papers that focus on the Fire-Sale FDI of the Asian Crisis of 1997-1998 (Aguiar and Gopinath (2005) and Acharya et al. (2011)), the only other paper that looks at a similar question is Soliman (2005) who analyzes the impact of currency crises on outgoing U.S. FDI and finds some evidence of a Fire-Sale (or at least an increase in FDI following the crisis). Several other papers that directly relate to my research program are worth mentioning.

Alfaro et al. (2004) focus on the ways in which the growth effects of FDI depend on the strength of the domestic financial markets of the host country. The implication of their findings appears to be that a country with post-crisis weakened financial sector will likely gain less from FDI (FDI will be less productive) and therefore will experience reduced inflows. Dell’Ariccia et al. (2008) present related evidence on the heightened vulnerability to financial dis-intermediation of sectors that rely on foreign investment. Several papers have also investigated the response of foreign multinationals to a sharp depreciation of the currency in the host economy, without directly examining FDI. Using U.S. multinational data, for example, Desai et al. (2008) find that foreign firms increase their own investment, following a large depreciation, relative to domestic firms.

3. Data Sources, Descriptive Statistics and Estimation

Blonigen and Wang (2005) and Noy and Vu (2007) argue that mixing wealthy and poor countries is inappropriate in empirical FDI studies. They note that the factors that affect FDI inflows are different across income groups. I therefore focus only on developing/emerging markets. I leave a similar investigation for developed countries for

future work. I also exclude OPEC member countries as their FDI is heavily concentrated in natural resources. My sample therefore contains 40 emerging/developing countries (a detailed list is included in the Appendix A). My data cover annual observations for the period of 1987-2009. Appendix Table B describes the crisis typology I use (based on Reinhart and Rogoff, 2009); and Appendix C contains a full list of data sources used in my analysis.

3.1. M&A, greenfield, horizontal and vertical FDI

Only a few papers have distinguished between different types of FDI and treated them as separate types of capital flows. A recent example, Wang and Wong (2009) investigate the growth impact of M&A and Greenfield foreign direct investment separately, as does an earlier paper by Calderón et al. (2004). More directly relevant to my work, Alquist et al. (2009) investigate whether M&A projects that were implemented in a post-crisis environment (i.e., Fire-Sale M&A) fail more often than non-crisis-induced M&A.

Given a lack of common source for FDI data, I collected data on from different FDI measures that have been typically used in previous studies: FDI flows, FDI stocks, Mergers and Acquisitions (M&A), and foreign affiliate sales.

My source of cross-country FDI flows, stocks, and cross-border mergers and acquisitions (M&A) is UNCTAD's FDI database, compiled by Thomson Financial. UNCTAD classifies foreign direct investment as an “investment involving a long-term relationship and reflecting a lasting interest and control by a resident entity in one economy of an enterprise resident in a different economy” (UNCTAD, 2009). M&A are

defined as the mergers with, or acquisitions of, domestic firms by a single foreign investor with more than ten percent equity capital. Data on cross border M&A have been used in such studies as Rossi and Volpin (2004) and Head and Reis (2008). One limitation of this dataset is a substantial amount of missing values, and possibility of significant underreporting, since many of the transactions are between private firms.

Following Calderon *et al.* (2004) and Wang and Wong (2009), I construct a measure of greenfield FDI by subtracting cross-border M&As from FDI inflows. While this proxy is not ideal, UNCTAD documents that FDI can be considered approximately as the sum of greenfield investment and M&As (UNCTAD, 2000, p.114-119)³.

To distinguish between horizontal and vertical FDI, I use the destination market for the sales of U.S. multinationals since 1987 (data from the U.S. Bureau of Economic Analysis). Following Hanson *et al.* (2002) and Aizenman and Marion (2004), I measure vertical investment as affiliate sales either back to the U.S. or to other foreign countries. Horizontal investment is defined by affiliate sales in the local market where the affiliate resides. The assumption is that the latter are sales of final goods, while the former represent intermediate goods requiring further processing in the parent country or a third country. This is the best available metric to distinguish between horizontal and vertical FDI. Moreover, several studies (e.g., Carr, et al., 2001, and Bergstrand and Effer, 2007) have stressed the use of affiliate sales as the most appropriate measure of actual multinational firm activity in a host country.

³ Given the lack of existing greenfield investment data, this measure is the most natural alternative proxy. However, since FDI data are reported on a balance-of-payment basis, where inward FDI in a host country is measured as the aggregation of greenfield investment, M&A sales, re-investments, and disinvestments undertaken by MNCs, this proxy does not perfectly reflect the actual value of greenfield investment.

Table 1 reports FDI statistics for my sample of 44 countries by region, decade and type of FDI. I note the well known dramatic increase in FDI volumes over the last 30 years that is observable for all regions and all types of FDI. I also observe that comparatively, FDI in Asia is more vertical, and includes less M&A compared to Latin America, the other region that receives a large volume FDI.

Table 1: FDI statistics (\$US millions at current prices and current exchange rates)

FDI Inflows	Total	M&A	Greenfield ¹	Horizontal	Vertical
Totals:	3,495,833.7	698,676	2,656,992.4	4,784,931	2,350,113
By decade					
1980s (1987-1989)	51,431.8	1,105.0	24,101.2	88,767	278,095
1990s (1990-1999)	911,317.1	183,725.0	680,480.1	1,341,525	588,552
2000s (2000-2009)	2,533,084.8	513,846.0	1,952,411.1	3,354,639	1,483,466
By region (# of countries in group):					
South and East Asia (8)	1,442,765.5	219,481.0	1,198,179.9	1,337,290	869,685
Middle East and North Africa (4)	116,737.1	36,336.0	60,293.1	30,254	9,951
Sub-Saharan Africa (10)	212,899.1	40,115.0	115,741.5	197,004	74,713
Latin America (18)	1,150,643.2	247,800.0	866,846.1	2,917,919	1,281,832
East Europe and Central Asia (4)	572,788.7	154,944.0	415,931.8	302,464	113,932

¹While Greenfield FDI = Total FDI inflows -M&A value, following Calderon *et al.* (2004), we leave the values for Greenfield FDI missing where M&A values are missing, consistent with Calderon, et al (2004).

3.2. *Typology of crises and data sources*

The literature on financial crises is quite large, but only in the last few years a typology of crises has become used more often, especially since the publication of the comprehensive examination of the historical record provided by Reinhart and Rogoff

(2009). I follow Reinhart and Rogoff (henceforth R&R) in identifying banking, currency, debt (external and domestic), stock market, and inflation crises. I also distinguish severe crises: systemic banking crises (as identified by bank runs that lead to the closure, merging, or takeover by the public sector of one or more financial institutions), and hyperinflation crises (identified as an annual inflation rate of 500% or higher⁴).

R&R's comprehensive data set on financial crises provides the dating of various types of crises in seventy countries over the period 1970-2010. It builds heavily on the work of earlier scholars, but also employs a considerable amount of new material from diverse primary and secondary sources. I focus on the period of 1987-2009 when FDI became prevalent in the countries in my sample (developing/emerging).

To identify systemic banking crises, I use a database developed by Leaven and Valencia (2010). The database builds on the Caprio, et al. (2005) banking crisis database and covers worldwide systemic banking crises for the period of 1970-2007. Table 2 presents a summary of my data on crisis types in my sample. It reports the number of distinct crises episodes as well as the total number of years in crises by crisis type and by decade.

As can be seen from Table 2, developing countries have been prone to financial crises in the last two decades. In the period of 1987-2009, developing countries experienced 68 distinct banking crises episodes, 42 of which constituted systemic banking crises. Currency crises occurred in developing countries 118 times, adding up to a total of 326 years of currency crises, or an average of 8 years per country. Inflation crises were less prevalent – 54 distinct episodes with 10 hyperinflation episodes. Stock markets crashed a total of 90 times, and there were 54 (17) episodes of external

⁴ The 500% threshold was adopted from Reinhart and Rogoff (2009).

(domestic) debt crises. There is no apparent increasing time trend in the frequency of crises among developing/emerging countries, in spite of the recent global turmoil.

Table 2: Crises in developing and emerging countries, 1987-2009

Crisis Types	Number of distinct crisis episodes (Total years in crisis)	By decade		
		1987-1989	1990-1999	2000-2009
Banking crisis	68 (255)	27 (85)	31 (131)	10 (39)
Systemic banking crisis	42 (122)	16 (45)	20 (58)	6 (19)
Currency crisis	118 (326)	50 (152)	39 (126)	28 (47)
Inflation crisis	54 (315)	21 (143)	24 (133)	9 (39)
Hyperinflation crisis	10 (27)	6 (14)	3 (9)	1 (4)
Stock Market crisis	90 (212)	16 (63)	44 (85)	30 (64)
Domestic debt crisis	17 (80)	11 (39)	3 (27)	3 (13)
External debt crisis	54 (361)	37 (167)	20 (117)	9 (73)

The sample excludes OPEC economies

3.3. *Control variables*

My main concern in the choice of additional variables to include in my estimation is to prevent any omitted variables bias from affecting the estimates I obtain for my RHS variables of interest (the financial crisis indicators). Given this concern, I choose to err on the side of caution and include an extensive list of controls. Blonigen and Piger (2011) conclude, using Bayesian averaging technique, that a fairly extensive list of controls should be included in FDI regressions, though they also point to a few that are probably not robustly associated with FDI.

Adhering to their findings, I control for broad macroeconomic conditions, political, socio-economic, and business environment in the host country by using a set of indicators on corruption, government stability, and investment climate from the Freedom House and International Country Risk Guide – Political Risk Service (ICRG-PRS) databases. I also include measures from the World Bank’s World Development Indicators (WDI) on relative factor endowments, communications infrastructure, and trade costs. Finally, I control for geographic spatial issues and possible agglomeration effects by using the data from Penn World Tables and CEPII Gravity data set (Head *et al.*, 2010). Additional data sources for my control variables are Barro and Lee (education data set) and Li et al. (2011) dataset on per capita real capital.

The list of all controls used in my analyses and the corresponding data sources is included in the Appendix C. For readability, I do not include estimates for these controls in the reported regressions in tables 3-8; complete results are available upon request.

3.4. Estimation Methodology

I estimate the following equation:

$$FDI_{it}^T = \beta_1 + \beta_2 CRIS_{it}^P + \beta_3 X_{it} + \varepsilon_{it} \quad (1)$$

Where FDI_{it}^T is the measure of FDI inflows for country i in year t , and of type T (M&A, greenfield, horizontal, vertical), $CRIS_{it}^P$ is the binary crisis indicator for crisis type P , and X_{it} is a vector of control variables as described the previous section. I use panel Arellano-Bond GMM estimation (with STATA) instead of relying on the cross-sectional datasets that are sometimes used in the FDI literature. Using panel estimation highlights several advantages over a conventional cross-section. Panel estimation methods offer us a

way to control for unobservable time-invariant effects and hence give more reliable estimates, while the AB-GMM estimation algorithm allows us to control for potential endogeneity of some of the control variables within the context of a dynamic panel.

I treat the crisis variable as predetermined, assuming that the current period error term is uncorrelated with current and lagged crises, but may be correlated with the future crises. It is a weaker restriction than strict exogeneity, which requires the variable to be uncorrelated with past, present, and future shocks.⁵ I also follow the standard practice of reporting the one-step estimates as Arellano and Bond (1991) show that the two-step procedure has poor finite sample properties.

A final issue that I should address is that of using too many instruments. When using estimators of this type, the number of instruments will increase at a rate that is quadratic in T . As discussed by Roodman (2009), the fundamental issue here is that when there are too many instruments relative to the sample size, the R^2 on the first stage will approach unity and so the second stage estimator will be almost equivalent to OLS. To address this problem, I follow the literature and limit the maximum number of lags that can be used as instruments at one⁶.

4. Results

Tables 3-8 report the results of my empirical analysis. For each measure of FDI activity, I use ten different specifications: Regressions (1) – (8) include each crisis separately, in (9) I include all crises jointly, and in (10) I only include severe crisis

⁵ The assumption of strict exogeneity, while plausible, may still be violated if large flows of FDI change the probability of occurrence for financial crises. While we do not find it a very plausible scenario, we prefer not to impose a strict exogeneity assumption.

⁶ See Roodman (2008) and Halliday (2011) for a discussion of instruments in a GMM-framework.

episodes (severe banking crises and hyperinflation). Coefficients for my other control variables are often significant with the expected sign. FDI is positively related to host country's level of government stability, GDP per capita, gross fixed capital formation, and socioeconomic conditions. Education level in host country has a positive effect on greenfield and horizontal investment, but a strong negative effect on total FDI flows and vertical FDI in particular, suggesting, not surprisingly, that vertical FDI is attracted to cheap labor in host developing countries. Surprisingly, greenfield FDI and horizontal FDI are also positively affected by corruption and negatively by the quality of institutions.

Table 3 reports the estimates for determinants of FDI flows. Estimates for banking crisis, inflation crisis, hyperinflation crisis, and external debt crisis are all negative and statistically significant. Banking crises are shown to reduce FDI by \$US 3.4 billion ($p=0.00$), while inflation and hyperinflation crises lead to a decrease in FDI flows by 2.9 billion ($p=.00$), and 19.7 billion ($p=.00$) dollars respectively. An external debt crisis in a given year is shown to decrease FDI flows by \$US 5.5 billion dollars ($p=.00$). Coefficients on stock market crash, currency, and domestic debt crises are statistically insignificant.

Table 4 reports the estimates for determinants of FDI stocks. Coefficients for banking crisis, inflation crisis, and external debt crisis are all negative and statistically significant, shown to reduce FDI by \$US 127.1 billion, 136.0 billion ($p=.04$), and 152.2 billion ($p=.07$) dollars respectively. When only the severe crises are included, a hyperinflation crisis in a given year is shown to decrease FDI stocks by \$US 1,284.4 billion dollars ($p=.00$). Coefficients on stock market crash, currency, and domestic debt crises are insignificant.

Table 3: Arellano-Bond Difference GMM Estimation for FDI flow

Dependent variable: FDI flow (in millions of real US dollars)

Independent variable	(1)	2)	(3)	(4)	(5)	(6)	(7)	(8)	(9) All crises	(10) Severe crises
Banking crisis	-3,413.6*** (753.3)								3,211.6*** (742.6)	
Systemic banking crisis		-1,377.6 (901.1)								-1,219.3 (909.5)
Inflation crisis			-2,891.8*** (962.8)						-2,185.5** (893.1)	
Hyperinflation crisis				-19,737.4*** (2,178.4)						-19,690.2*** (2,166.5)
Currency crisis					22.1 (720.9)				40.9 (704.7)	
Stock market crisis						201.3 (723.6)			751.7 (730.2)	
Domestic debt crisis							-1,930.1 (1,422)		164.5 (1,118.6)	
External debt crisis								-5,496.4*** (1,196.9)	-4,832.7*** (1,149.3)	
# observations	529	529	529	529	527	529	529	529	527	529
# countries	34	34	34	34	34	34	34	34	34	34
# instruments	164	164	164	154	164	164	164	164	244	170

* denotes 10% significance, **5% significance, ***1% significance

One-step standard errors in parentheses

Table 4: Arellano-Bond Difference GMM Estimation for FDI stock

Dependent variable: FDI stock (in millions of real US dollars)

Independent variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9) All crises	(10) Severe crises
Banking crisis	-127,052.6** (53,070.3)								-108,115.0** (51,319.6)	
Systemic banking crisis		-33,626.0 (65,985.1)								-66,480.5 (64,634)
Inflation crisis			-136,041.7** (65,981.6)						-93,265.6 (60,785.6)	
Hyperinflation crisis				-1,316,256*** (172,400.2)						-1,284,376.0*** (170,267.6)
Currency crisis					-46,434.4 (49,158.7)				-30,524.3 (47,965)	
Stock market crisis						-44,888.9 (49,801.9)			44,795.6 (49,709.2)	
Domestic debt crisis							-51,284.8 (107,553.3)		21,423.5 (105,997.1)	
External debt crisis								-152,188.0* (82,783.7)	-126,134.4 (79,537.1)	
# observations	545	545	545	545	545	545	545	545	543	545
# countries	34	34	34	34	34	34	34	34	34	34
# instruments	182	182	182	182	182	182	182	182	267	189

* denotes 10% significance, **5% significance, ***1% significance.

One-step standard errors in parenthesis

I then distinguish between the different motivations for FDI and examine the effects of the crises on vertical and horizontal FDI separately. I observe in Table 5 that an inflation crisis (and particularly a hyperinflation crisis) has a strong negative and statistically significant effect on vertical FDI in my sample. An inflation crisis in a given year is shown to decrease vertical FDI by \$US 29.8 billion ($p=.01$). Hyperinflation exaggerates this effect tenfold to \$US 299.3 billion ($p=.00$). External debt crises are also shown to reduce the value of vertical FDI by \$US 32.9 billion ($p=.00$). The effects of the other types of crises on vertical FDI are shown to be insignificant.

Horizontal FDI targets the domestic market, so I expect that a financial crisis that entails a real contraction will adversely affect horizontal FDI. Indeed, I observe (Table 6) the same types of crises that affect vertical FDI, have a strong negative effect on horizontal investment. I find that an inflation crisis and hyperinflation crisis reduce the value of horizontal FDI by \$US 65.3 ($p=.02$) and \$US 580.5 ($p=.00$) billion respectively in a given year. External debt crisis also negatively impacts horizontal FDI, reducing its value by \$US 86.7 billion dollars ($p=.00$). I also find that a systemic banking crises increases the value of horizontal FDI by \$US 34.6 billion ($p=.07$).

Table 7 reports my results on M&A investment. I find that, contrary to the fire-sale FDI hypothesis, financial crises have a significant adverse effect on the value of M&A. In particular, banking crises are shown to reduce M&A investment by \$US 1.4 billion ($p=.02$). Both domestic and external debt crises also affect M&A investment adversely, reducing its value by \$US 2.4 ($p=.04$) and \$US 1.6 ($p=.05$) billion dollars respectively. Lastly, I examine the effects of FDI on greenfield investment and find no significant effect.

Table 5: Arellano-Bond Difference GMM Estimation for Vertical FDI

Dependent variable: Vertical FDI (value of vertical FDI, in millions of real US dollars)

Independent variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9) All crises	(10) Severe crises
Banking crisis	-785.2 (7,407.9)								3,866.7 (6,897.8)	
Systemic banking crisis		4,957.7 (8,771.7)								7,543.148 (8,537.0)
Inflation crisis			-29,829*** (10,678.3)						-20,274.6** (9,560.8)	
Hyperinflation crisis				-299,297.6*** (33,803.0)						-298,405.0*** (33,642.7)
Currency crisis					4,993.0 (7,369.8)				5,150.4 (7,142.0)	
Stock market crisis						976.0 (6,475.7)			-1,764.6 (6,432.4)	
Domestic debt crisis							-2,345.0 (14,807.9)		4,080.8 (14,781.5)	
External debt crisis								-32,961.4*** (11,020.2)	-22,597.1** (10,433.5)	
# observations	282	282	282	282	282	280	282	282	282	282
# countries	21	21	21	21	21	21	21	21	21	21
# instruments	181	179	182	165	182	181	182	178	253	179

* denotes 10% significance, **5% significance, ***1% significance.

One-step standard errors in parentheses

Table 6: Arellano-Bond Difference GMM Estimation for Horizontal FDI

Dependent variable: Horizontal FDI (value of horizontal FDI, in millions of real US dollars)

Independent variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9) All crises	(10) Severe crises
Banking crisis	25,776.1 (16,288.2)								22,515 (15,435.2)	
Systemic banking crisis		28,026.9 (20,183.4)								34,567.3* (19,255.7)
Inflation crisis			-65,353.6** (26,663.6)						-36,516.5 (25,378.3)	
Hyperinflation crisis				-580,530.8*** (63,463.3)						-585,585.4*** (62,537.9)
Currency crisis					-1,493.8 (17,475.5)				-10,445.9 (17,280.9)	
Stock market crisis						18,591.9 (14,435.3)			8,767.9 (14,465.9)	
Domestic debt crisis							3,902.4 (38,364.3)		61,669.6 (40,808.4)	
External debt crisis								-82,672.5*** (26,482.8)	-73,236.8*** (26,625.7)	
# observations	249	249	249	249	247	249	249	249	247	249
# countries	22	22	22	22	22	22	22	22	22	22
# instruments	179	176	179	163	177	178	172	177	233	177

* denotes 10% significance, **5% significance, ***1% significance.

One-step standard errors in parentheses

Table 7: Arellano-Bond Difference GMM Estimation for Mergers and Acquisitions (M&A)

Dependent variable: M&A Value (value of M&A, in millions of real US dollars)

Independent variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9) All crises	(10) Severe crises
Banking crisis	-1,361.4** (569.9)								-951.0* (540.4)	
Systemic banking crisis		-91.3 (680.7)								-277.8 (689.9)
Inflation crisis			-262.6 (992.6)						-449.9 (833.2)	
Hyperinflation crisis				-2,132.5 (1,784.0)						-2,372.4 (1,794.0)
Currency crisis					-99.0 (535.4)				91.4 (524.6)	
Stock market crisis						-360.9 (472.9)			-159.3 (457.6)	
Domestic debt crisis							-2400.2** (1,176.9)		-959.1 (1,109.4)	
External debt crisis								-1,619.4** (821.9)	-1,177.7 (791.9)	
# observations	280	280	280	278	278	280	280	280	278	280
# countries	30	30	30	30	30	30	30	30	30	30
# instruments	162	160	154	164	164	161	156	164	221	166

* denotes 10% significance, **5% significance, ***1% significance.

One-step standard errors in parentheses

4.1. Robustness checks

To be consistent with the portfolio allocation literature and to avoid a potential size and significance bias⁷, I scale dependent FDI variables by a country's GDP level. The effects of crises on the scaled FDI variables remain largely consistent, although some significance disappears. Tables 8 and 9 report the results of Arellano-Bond GMM estimation with scaled FDI flows and stocks as a dependent variable. The impact of banking crises and external debt crises remains negative and statistically significant. A banking crisis reduces FDI flows as a share of GDP by 57.8 percent, while an external debt crises leads to a significant decrease in the share of FDI stocks in GDP.

Consistent with baseline results presented in Table 5 and 6, inflation, hyperinflation, and external debt crises all have a negative and statistically significant effect on scaled vertical and horizontal investment (all less than 1 percent). With an exception of inflation crises, the effects of financial crises on M&A and greenfield investment (as a share of GDP) is insignificant, but negative, consistent with the baseline results reported in Tables 7 and 8. Moreover, to ensure the robustness of my results, I replicate my analysis using nominal and logged values of FDI as dependent variable. The signs and significance of my coefficients of interest remain largely unchanged.

Finally, I explore persistence of crisis effects on FDI by including multiple lags of the crisis variables. To determine the number of lags to include, I implement the Akaike (1974) information criteria (AIC) for each of the FDI measures. I report my results in Table 10.

⁷ When not scaled properly, the dependent variable has a size bias and the significance of variables associated with size tends to be overstated, even if controlled for size, as done in gravity regressions. See Ammer, et al. (2012) for a discussion on the importance of scaling and for examples, and Bekaert, et al. (2012) for an econometric analysis.

Table 8: Arellano-Bond Difference GMM Estimation for FDI flow as a share of GDP

Dependent variable: FDI flow as a share of GDP (all in real terms)

Independent variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Banking crisis	-.578*** (.213)							
Systemic banking crisis		-.157 (.292)						
Inflation crisis			.139 (.295)					
Hyperinflation crisis				-.240 (.651)				
Currency crisis					-.209 (.208)			
Stock market crisis						-.189 (.214)		
Domestic debt crisis							-.530 (.467)	
External debt crisis								-.569 (.352)
# observations	531	531	531	531	531	531	531	531
# countries	34	34	34	34	34	34	34	34
# instruments	164	164	164	154	164	164	164	164

* denotes 10% significance, **5% significance, ***1% significance

One-step standard errors in parentheses

Table 9: Arellano-Bond Difference GMM Estimation for FDI stock as a share of GDP

Dependent variable: FDI stock as a share of GDP (all in real terms)

Independent variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Banking crisis	.431 (.516)							
Systemic banking crisis		.707 (.684)						
Inflation crisis			.694 (.714)					
Hyperinflation crisis				-.329 (1.504)				
Currency crisis					-.215 (.501)			
Stock market crisis						.002 (.538)		
Domestic debt crisis							-.686 (1.032)	
External debt crisis								-2.04**
# observations	529	529	529	529	529	545	545	545
# countries	33	33	33	33	33	33	33	33
# instruments	182	182	182	182	182	182	182	182

* denotes 10% significance, **5% significance, ***1% significance.

One-step standard errors in parentheses

Table 10: Persistence of crises effects on FDI

Arellano-Bond GMM coefficient estimates of multiple lags of financial crises on FDI

Crisis Type	<u>Dependent Variable</u>				
	FDI flow	FDI stock	Vertical FDI	Horizontal FDI	M& A
Banking crisis	-3,089.90***	-95,774.17**			-1,407.22**
Lag 1	-2,149.02***	-86,356.30*			925.21*
Lag 2					390.53
Inflation crisis	-2,610.90***	-117,784.70*	-21,351.8**	-53,098.87**	
Lag 1	-1,714.12***	-68,012.73	-21,174.74**	-31,858.87	
Hyperinflation crisis	-16,128.95***	-906,730.30***	-336,538.4***	-484,942.6***	
Lag 1	-12,569.69***	-713,154.60***	-16,983.89	-444,060.2***	
Lag 2			132,340.1***	596,566.10***	
Lag 3			-128,066.6***	-284,272.30***	
Lag 4			38,216.51	6,426.60	
Lag 5			4,966.06	57,268.73*	
Domestic Debt crisis					-2,275.66*
Lag 1					-1,814.51
External debt crisis	-5,308.34***	-145,521.0*	-22,658.48**	-70,182.48*	-1,234.53
Lag 1	-2,647.44***	-58,913.49	-27,863.93***	-36,292.30	-1,631.16**
Lag 2		-27,848.13			
Lag 3		-52,779.66			
Lag 4		-14,411.86			
Lag 5		-25,216.17			
# observations	529	545	282	249	280
# countries	34	34	21	22	30
# instruments	155	173	183	180	164

Note: The number of lags included in each model is determined by the Akaike (1974) information criteria (AIC).

I observe that the effects of different types of crises on various forms of FDI vary in terms of their duration and persistence. The most persistent type of crisis appears to be hyperinflation crisis, with its average impact on both vertical and horizontal FDI lasting for over five years.⁸ The effects of the external debt crisis on FDI stocks also remain significant well into the fifth year following a crisis, albeit slightly diminishing each year. Similar trend is observed with banking crises and inflation crises, both of which significantly reduce all forms of investment for two years following the onset of a crisis. The negative impact of the external debt crises on vertical FDI and M&A, on the contrary, is larger in the year after the crisis relative to the year the crisis emerges.

5. Conclusion

I find that financial crises have an adverse effect on FDI in my sample of developing and emerging countries. In particular, banking crises, inflation crises, hyperinflation crises, and external debt crises lead to a significant decline in FDI inflows. Crises are also shown to reduce the value of vertical FDI, horizontal investment, and M&A. In general, I find no empirical evidence of Fire-Sale FDI in my sample of developing countries.

While these results may seem expected, they do not fit the pattern described by Krugman's Fire-sale FDI analysis of the Asian crisis. There may be at least two possible explanations for this difference. First, Asia was unique and the reasons for the Asian crisis different from other cases of financial crises. While Krugman focused on the Asian financial crises, my sample is broader both in its coverage of countries and years. I find no evidence of

⁸ Results for hyperinflation crises, however, are not robust and are sometimes counter-intuitive. Given the well known difficulties in collecting reliable macroeconomic data in a macroeconomic environment of wildly fluctuating prices we do not believe that the evidence is robust enough for any more general conclusions regarding hyperinflations.

fire-sale FDI following an *average* financial crisis in developing countries. Secondly, as is the case with any macroeconomic data, there are questions about the quality of FDI data (particularly, M&A data) and it may be that the data are simply not good enough to identify this fire-sale pattern.

It is important to note that Krugman's impetus was also normative. He asks: "does the foreign purchase of Asian assets represent the transfer of control to efficient owners who were previously unable to buy at a reasonable price? Or does it represent sales to inefficient owners who happen to have cash?" He further inquires: "Does the fire sale of domestic firms and their assets represent a burden to the afflicted countries, over and above the cost of the crisis itself?" (Krugman, 2000, p. 44)

My results do not suggest any normative conclusions and are solely descriptive. I introduce no normative claims, and therefore also do not believe my work necessarily implies any prescriptive conclusions. It may well be that while on net there is no fire-sale associated with large financial crises, some FDI transactions do involve fire-sale-characteristics and may even be morally questionable (as Krugman appears to suggest). In particular, it may be the case that some of the transactions that occur after a domestic financial collapse do transfer ownership to inefficient foreign owners ("who happen to have cash") and that this imposes additional long-term burden on the afflicted countries. None of what I find suggests that this categorically does not happen; examining net FDI flows, however, does not provide evidence of any such adverse impacts.

Moreover, my claim that FDI inflows also decline in the aftermath of financial crises, like other types of capital flows, does not necessarily contradict the consensus that FDI is preferable to 'hot money' during times of financial turmoil. The FDI reversals that I record are still

probably much smaller than the reversals associated with other types of financial flows (especially short-term debt).

The topic of financial crises and FDI is an important and timely one today given recent global financial turmoil. The findings of the paper are relevant not only because they evaluate the effects of crises on FDI, but because they inform us about the types of crises that these countries are experiencing (or are at least perceived to be experiencing). Just as Krugman concluded, observing or not observing fire-sale FDI lends support to either the fundamental explanation or the panic view behind the cause of the crisis. With regards to FDI, the findings are relevant as FDI is becoming increasingly important as a form of capital flows, and changes in the valuation of FDI projects also leads to significant international transfers of wealth.

My results find support in the FDI reversal that is apparent in the immediate aftermath of the 2008-2010 global financial crisis, by far the most global recession since the great depression (Bordo and Landon-Lane, 2010). While the long-run effects of this crisis still remain to be seen, the current downturn has been accompanied by a precipitous decline in FDI flows worldwide of 40% between the peak in 2007 and the trough in 2009 (UNCTAD, 2011). The recent crisis, of course, was global, so credit contracted everywhere; that is not the usual turn of events surrounding a financial crisis that is limited to a specific country and/or region. Yet, even in these cases, I observed large declines in FDI inflows of (almost) all types.

Chapter 2: ASEAN Foreign Direct Investment Responds to Economic Crises

1. Introduction

The Association of Southeast Asian Nations (ASEAN) has boasted rapid growth in terms of GDP, trade, and FDI in the past two decades even despite such destabilizing events as the Asian crisis of 1997 and the global recessions of 2001 and 2008. Like other parts of the world, the region took a severe hit in the recent global economic downturn; yet ASEAN was one of the first regions to show signs of recovery and continues to impress observers with its outstanding economic performance. In this paper I analyze historical data on ASEAN inward foreign direct investment (FDI) in the context of the Asian crisis of 1997 and the global economic downturn of 2008. I compare national responses and effects of the crises across the most hit countries and explain significant differences in recovery rates. Moreover, I present new data on ASEAN FDI cycles following the 1997 crisis relative to historical crises incidences.

Using the methodology of Reinhart and Rogoff (2009), I measure the duration and magnitude of the post-crisis FDI cycles in ASEAN and compare them to other historical crisis incidences. Moreover, I thoroughly and empirically examine the effects of the Asian financial crisis on ASEAN and compare them to the historical averages for the Asian region as well a broad sample of 40 developing countries. An important contribution of this paper is that I distinguish between the different types of financial crises and the different forms of FDI. I expect different types of FDI to react differently to financial turmoil, and therefore distinguish between different types of FDI—i.e., Mergers and Acquisitions (M&A) and Greenfield investments—and between different motivations for FDI—horizontal (tariff jumping)⁹ and

⁹ Referring to horizontal FDI as tariff jumping is a generalization. Horizontal FDI could also be motivated by taking advantage of a growing market in services that needs some in-country presence (e.g., insurance).

vertical (integrating production stages). In addition, I add a more granular detail about the types of financial crises and their potentially differential effects on FDI.

This chapter contributes to the literature on the Asian financial crisis as it relates to ASEAN. During the decade following the crisis, numerous studies have examined its causes and effects as well as national policy responses and lessons learned for the countries involved. Most economists agree that the crisis was caused by a combination of weak fundamentals and investors' irrational behavior (Corden, 2007, Neely, 1999, Corsetti *et al.*, 1998, Estanislao *et. al.*, 2000 among others), emphasizing the need to account for cross country differences (Berg, 1999, Berg and Patillo, 1999). Researchers have also stressed the role of domestic financial market liberalization (Noy, 2005) and investment links between troubled economies (Kim and Haque, 2002). Studies have evaluated the effects of the crisis on exchange rates (Wilson and Ng, 2008), the banking system (Jeon and Miller, 2004) and even on growth through FDI (Thangavelu *et al.*, 2009), but to my knowledge, no study comprehensively considers the effects of the crisis on foreign direct investment in ASEAN. Indeed, existing work on foreign investment in ASEAN has been limited to investment climate studies (Urata and Ando, 2010; Thompson and Poon, 2000) and empirical estimations of ASEAN integration initiatives on FDI in the region (Plummer and Cheong, 2007; Uttama, 2005).

1. 1 Background on ASEAN

ASEAN was established in 1967 in Bangkok, Thailand and has become the primary organization in the region. Its stated objectives are to accelerate economic and social progress in Southeast Asia and to promote regional cooperation in the areas of security, sociocultural and economic integration, with the goal of creating an ASEAN Economic Community (AEC) by

2015. To achieve this goal, the ASEAN Free Trade Area (AFTA) was created in 1992 as a trade block with a Common Effective Preferential Tariff (CEPT) scheme. AFTA has been instrumental in increasing ASEAN's competitiveness as a production base through the eliminating of tariffs and non-tariff barriers within the region, as well as in attracting foreign direct investment. As part of its efforts to become a globally competitive economic region, ASEAN has intensified its efforts and initiatives on investment facilitation and promotion. In April 2012, ASEAN members signed the ASEAN Comprehensive Investment Agreement (ACIA), aimed at establishing an integrated investment area and improving the region's business environment.

TABLE 11
Basic Indicators for select ASEAN countries, 2009

Economy	Population (million)	GDP (\$US billion, at current prices)	Average growth rate of GDP (1986-2006)	GDP per capita (\$US, at current prices)	Average growth rate of GDP per capita (1986-2006)	Trade/GDP (2009, percent)
Brunei	0.4	14.1	1.5	34,827.0	-1.1	67.6
Cambodia	14.9	10.4	8.5	693.2	6.2	120.5
Indonesia	231.4	546.5	5.2	2,362.1	3.7	39
Laos	5.9	5.7	6	969.6	3.6	60.8
Malaysia	28.3	191.6	6.4	6,769.5	3.8	146.1
Myanmar	59.5	24.0	5.2	403.5	3.6	42.4
Philippines	92.2	161.1	4.1	1,747.3	1.8	50.5
Singapore	4.9	177.6	7	35,602.0	4.5	289.7
Thailand	66.9	264.2	6.1	3,949.5	4.8	108
Vietnam	87.2	96.7	7	1,104.2	5.2	131.9
ASEAN	591.8	1,491.7	5.7	2,520.4	3.6	103.1
Total Asia	3,714.00	12,081.0	4.0	3,253.0	2.5	62.9
European Union	461.3	16,586.0	2.4	35,958.0	2.0	64.3
United States	301.1	13,841.0	3.1	45,963.0	2.0	22.4
World	6,697	40,232.0	3.8	7,651.0	1.7	50.5

Source: Asian Development Bank, 2008 and ASEAN Secretariat, 2010

ASEAN boasts rapid economic growth over the past 20 years, with an average annual growth rate of 5.7 percent, far exceeding the world average growth of 3.8 percent. International trade has been an important component of the ASEAN economy. As shown in Table 11,

ASEAN openness exceeds the world average of 50.5 percent for nearly all member countries. Five out of ten ASEAN countries have trade to GDP ratios above 100 percent. Growth in the region has largely been export-led.

Yet, wide disparities exist across ASEAN members not only economically, but also in the political and social aspects, as shown in Table 12 below. ASEAN countries speak at least 12 different languages and practice fundamentally different religious beliefs making it one of the most unique regional organizations. ASEAN member nations range from Muslim sultanate Brunei with the smallest population and the highest GDP per capita to the republic of Indonesia – the largest and one of the poorest ASEAN countries with GDP per capita of only \$1,922. Brunei is also the only ASEAN country with a negative average growth rate of GDP per capita. Cambodia, Laos, and Indonesia stand out as having extremely high infant mortality rates (56.59, 79.61, and 31.04 per 1000 births respectively) as compared to Singapore's 2.3. Laos also has the lowest life expectancy at birth of only 56.29 years with GDP per capita of only \$696. Other ASEAN countries whose citizens live below the poverty line include Myanmar and Cambodia with GDP per capita of \$193 and \$579 respectively (WDI, 2009 and US Census Bureau, 2009).

2. Foreign direct investment

2.1. Investment climate in ASEAN

Foreign direct investment (FDI) has played an important role in the region's development and growth. Since the 1980's ASEAN has transitioned to a pro-FDI approach to development which brought in new technologies, capital, foreign exchange and access to external markets. Over the last twenty years, the region has become an increasingly attractive destination for

foreign investment. This fact has often been attributed to actively pursuing policies aimed at improving microeconomic environment and investment climate in the region¹⁰.

One indication of ASEAN's increasing attractiveness to foreign investors comes from the annual World Bank Doing Business report which ranks countries on the overall business environment as well as various specific business regulations and their enforcement in practice. Economies are ranked on their ease of doing business, from 1 – 181, with first place being the best. The rankings, presented in Table 13 are from the Doing Business report (2009), covering the period April 2007 to June 2008. Comparing these data with the overall rankings in 2005, we observe an improving business environment in all ASEAN countries, except the Philippines. Thailand demonstrated the most significant improvement in the ease of doing business from 2005 to 2008, lowering its rank by 15, followed by Vietnam and Cambodia which are respectively 12 and 8 rankings closer to the world leader, Singapore.

Despite significant progress in most of the region, problems still remain which dampen ASEAN's attractiveness to potential foreign investors. Indonesia, Philippines, Cambodia, Vietnam and Laos still rank in the bottom third of all countries in their 'doing business' environment. Starting a business and employing workers in these countries is among the most cumbersome in the world. Dealing with construction permits is ranked extremely low in Cambodia, Philippines and Laos, but even lower in Malaysia, a country with a relatively high overall doing business rank. Newer ASEAN members¹¹ Vietnam and Laos also suffer from weak regulatory framework in protecting investors and paying taxes.

¹⁰ I will discuss the investment climate in detail in the next section.

¹¹ When ASEAN was founded in 1967, it consisted of five members: Thailand, Indonesia, Malaysia, Singapore, and Philippines. Since then, membership has expanded to include Brunei (1984), Vietnam (1995), Myanmar (1997), Laos (1997), and Cambodia (1999).

TABLE 12
Political, Social, and Demographic Indicators for Select ASEAN Countries, 2008

Country	Government Type	Major Religion	Official Language(s)	Growth rate of population	Infant mortality rate	Life expectancy
Brunei	Constitutional sultanate	Muslim (67%)	Malay	1.79	12.69	75.52
Cambodia	Multiparty democracy under a constitutional monarchy	Buddhist (96%)	Khmer	1.75	56.59	61.69
Indonesia	Republic	Muslim (86%)	Indonesian	1.18	31.04	70.46
Laos	Communist state	Buddhist (67%)	Lao	2.34	79.61	56.29
Malaysia	Constitutional monarchy	Muslim (60%)	Bahasa Malaysia	1.74	16.39	73.03
Philippines	Republic	Catholic (81%)	Filipino,	1.99	21.2	70.8
Singapore	Parliamentary republic	Buddhist (43%)	Mandarin, English, Malay	1.14	2.3	81.89
Thailand	Constitutional monarchy	Buddhist (95%)	Thai	0.64	18.23	72.83
Vietnam	Communist state	None (81%)	Vietnamese	0.99	23.61	71.33

Source: U.S. Census Bureau, International Data Base (2009) and CIA World Fact book, 2011

TABLE 13
Investment Climate in ASEAN: Rankings from the Doing Business Report, 2009

Measure	Country							
	Camb	Indo	Laos	Malaysia	Phil	Sing	Thai	Vietnam
Ease of doing business rank	135	129	165	20	140	1	13	92
(change in rank from 2005)	(-8)	(-6)	(-6)	(-5)	(+14)	(0)	(-15)	(-12)
Starting a business	169	171	92	75	155	10	44	108
Dealing with construction permits	147	80	110	104	105	2	12	67
Employing workers	134	157	85	48	126	2	56	90
Registering property	108	107	159	81	97	16	5	37
Getting credit	68	109	145	1	123	5	68	43
Protecting investors	70	53	180	4	126	2	11	170
Paying taxes	24	116	113	21	129	5	82	140

Source: Doing Business Report 2009 and 2007

Note: No data available for Brunei Darussalam and Myanmar

Table 14 summarizes the most problematic factors affecting business in select ASEAN countries. These data are based on the survey results of the Global Competitiveness report (2008) in which business executives were asked to select the five most problematic factors for doing business in their country. Corruption appears in the top three most problematic factors for doing business in three of the six ASEAN countries (Cambodia, Malaysia, and Philippines), in two of which it is the leading factor. Other prevalent problematic factors cited are inefficient government bureaucracy and inadequately educated workforce.

TABLE 14
Top Three Most Problematic Factors for Doing Business in Select ASEAN Countries

Economy	Top Three Most Problematic Factors for Doing Business (Percent of responses)
Cambodia	Corruption (21.2) Inefficient government bureaucracy (13.1) Inadequately educated workforce (10.3)
Indonesia	Inadequate supply of infrastructure (20.5) Inefficient government bureaucracy (16.1) Access to financing (10.8)
Malaysia	Inefficient government bureaucracy (16.1) Corruption (9.0) Inadequately educated workforce (8.6)
Philippines	Corruption (22.3) Inadequate supply of infrastructure (17.8) Policy Instability (15.2)
Singapore	Inadequately educated workforce (17.8) Restrictive labor regulations (16.1) Inflation (10.5)
Thailand	Policy instability (16.9) Inefficient government bureaucracy (14.5) Government instability/coups (13.9)

Source: Global Competitiveness Report, 2008

2.2 Recent FDI Trends in ASEAN

One indication of the relative importance of multinational enterprise (MNE) activity in the ASEAN region is FDI inflows as measured by balance of payments (BOP) statistics. The BOP data are imperfect indicators of MNE activity as they represent only one form of financing, for example reinvested earnings are excluded, and does not characterize activity. Unfortunately, data on MNE employment, affiliate sales, and output are not readily comparable across countries.

Table 15 provides the stock of inward FDI as a percent of gross domestic product (GDP). Reflecting the demand for fixed capital and the need to accumulate foreign capital for growth, inward FDI in developing countries traditionally is significantly higher than in advanced economies as a share of GDP. In 1990 for example, developing countries accumulated inward FDI at 13.8 percent of their combined GDP compared to inward FDI stock of 8.1 percent of GDP within developed countries.

From 1980 until 2007, ASEAN inward FDI stock has outpaced the world and developing economies as a share of GDP. The role of FDI in the ASEAN economy of Singapore has been unprecedented with stock rates expanding from 45.7 percent in 1980 to nearly 160 percent of GDP by 2007. Malaysia and Viet Nam have also sustained extraordinary FDI stock to GDP ratios over the past thirty years. Since 2000, the emerging economies of Thailand, Cambodia, and Brunei have maintained steady FDI growth and, by 2007, supported inward FDI stocks as a share of GDP of 34.9, 48.7, and 81.7 percent respectively.

The UNCTAD data on FDI inflows by region are reported in Table 16. The profile of ASEAN as a multinational hub has evolved over the past fifteen years. ASEAN FDI inflows have increased by 368% from 1992 to 2008, reaching their record high levels of \$60.5 billion in

2007 (UNCTAD, 2009). The main sources of ASEAN inward FDI inflows have consistently been the European Union (EU), United States, and Japan with their 2009 shares to total net inflow of 19.2, 10.4, and 9.4 percent respectively. Notably, intra-ASEAN FDI flows have been increasing over the past years and peaked at \$10.5 billion in 2008 making them the leading source of foreign investment into ASEAN that year (ASEAN Secretariat, 2010).

TABLE 15
Inward FDI stock as a percent of GDP

	1980	1985	1990	1995	2000	2005	2007	Percent increase
World	6.6	8.0	8.8	9.8	18.2	22.7	27.8	424.0
Developed economies	5.0	6.2	8.1	8.8	16.2	21.5	27.2	547.3
Europe	6.1	9.1	9.5	12.1	25.5	32.5	40.1	663.3
Developing economies	11.6	14.8	13.8	14.9	25.6	26.3	29.2	251.5
Africa	7.7	8.9	11.5	16.4	25.2	27.9	31.3	408.2
Latin America	5.0	8.8	9.6	10.5	22.2	28.9	28.3	561.1
Asia	16.7	19.8	16.3	16.6	26.0	23.6	29.1	174.2
ASEAN	9.5	12.6	18.2	22.6	45.2	45.8	43.5	459.2
Brunei	0.4	0.6	1.0	12.9	64.5	98.9	81.7	20751.3
Cambodia	5.3	3.6	2.2	10.8	43.1	39.9	48.7	921.1
Indonesia	5.7	6.0	6.9	9.3	15.2	14.8	13.6	238.0
Lao PDR	0.7	0.1	1.4	11.9	32.1	23.3	28.2	4175.0
Malaysia	21.1	23.7	23.4	32.3	58.4	34.0	43.1	204.4
Myanmar	0.02	0.02	5.4	15.6	53.1	40.9	28.7	163099.5
Philippines	2.8	6.0	10.2	13.7	24.2	14.8	13.2	469.3
Singapore	45.7	60.0	82.6	78.2	121.5	168.4	159.9	350.2
Thailand	3.0	5.1	9.7	10.5	24.4	34.3	34.9	1152.9
Viet Nam	59.1	30.2	25.5	34.5	66.1	58.9	59.7	101.1

Source: UNCTAD (2008)

A closer look at Table 16 however, reveals that while FDI flows to ASEAN have been rising significantly in nominal terms, the region's share of global FDI flows has been declining. In 1992, ASEAN inward FDI accounted for nearly a quarter of all FDI flows to developing countries. Malaysia led as a host to \$5.1 billion in inward FDI, followed by Singapore (\$2.2 billion), Thailand (\$2.2 billion), and Indonesia (\$1.8 billion). By 2007, ASEAN attracted less

than 13 percent of developing country FDI flows, and only 7.3 percent excluding Singapore.

Table 17 confirms this trend in ASEAN's FDI performance and reveals that ASEAN's share of global FDI inflows in 2008 was less than half that of its pre-Crisis share.

TABLE 16**FDI Inflows into ASEAN Countries and other regions (Billions of US Dollars)**

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
World	170.5	224.1	254.3	342.6	392.7	489.2	709.3	1098.9	1411.4	832.6	622.0	564.1	742.1	945.8	1305.9	1833.3	1697
Developed countries	115.5	143.3	148.2	222.0	239.4	286.6	509.1	860.2	1146.2	609.0	442.3	361.2	418.9	590.3	857.5	1247.7	962.3
Developing countries	53.2	77.6	103.5	116.0	147.0	190.6	189.6	228.5	256.1	212.0	166.3	178.7	283.0	314.3	379.1	499.7	620.7
Africa	3.8	5.4	6.1	5.7	6.0	11.0	9.5	12.4	9.7	20.0	13.6	18.7	18.0	29.6	35.5	53.0	66.2
Eastern Europe	0.3	0.4	0.7	0.7	1.0	3.1	3.9	3.7	3.7	4.3	4.3	8.4	13.4	15.1	26.3	53.7	-
Asia	32.9	56.0	68.2	80.0	94.1	105.8	95.3	111.5	148.3	113.5	98.3	115.0	170.0	208.7	259.4	319.3	-
ASEAN	12.8	16.6	20.4	28.2	30.5	34.3	22.3	28.8	23.5	20.7	18.0	24.5	35.2	41.1	51.5	60.5	59.9
Brunei	0.0	0.0	0.0	0.6	0.7	0.7	0.6	0.7	0.5	0.5	1.0	3.4	0.3	0.3	0.4	0.2	0.2
Cambodia	0.0	0.1	0.1	0.2	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.4	0.5	0.9	0.8
Indonesia	1.8	2.0	2.1	4.3	6.2	4.7	-0.2	-1.9	-4.6	-3.0	0.1	-0.6	1.9	8.3	5.6	6.9	7.9
Laos	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.3	0.2
Malaysia	5.1	5.7	4.6	5.8	7.3	6.3	2.7	3.9	3.8	0.6	3.2	2.5	4.6	4.0	6.1	8.4	8.1
Myanmar	0.1	0.1	0.1	0.3	0.6	0.9	0.7	0.3	0.2	0.2	0.2	0.3	0.3	0.2	0.1	0.4	0.3
Philippines	0.8	1.2	1.6	1.5	1.5	1.2	1.8	1.2	2.2	0.2	1.5	0.5	0.7	1.9	2.3	2.9	1.5
Singapore	2.2	4.7	8.6	11.5	9.7	13.8	7.3	16.6	16.5	15.6	7.2	11.7	19.8	15.0	24.2	24.1	22.7
Thailand	2.2	1.8	1.4	2.1	2.3	3.9	7.5	6.1	3.3	5.1	3.3	5.2	5.9	9.0	9.8	9.6	10.1
Viet Nam	0.5	0.9	1.9	1.8	1.8	2.6	1.7	1.5	1.3	1.3	1.2	1.5	1.6	2.0	2.3	6.7	8.0

Source: UNCTAD, 2010

TABLE 17
Share of World FDI Inflows, 1995-2008. (Selected Countries and Regions, % Share.)

Host	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
United States	17.23	21.63	21.29	24.73	26.30	22.73	19.44	11.83	9.40	18.49	10.77	16.23	13.70	18.62
EU	38.70	32.06	29.66	40.17	45.85	49.27	46.11	49.03	45.90	30.39	51.21	40.40	42.57	29.66
China	11.00	10.69	9.32	6.45	3.74	2.95	5.71	8.38	9.47	8.25	7.44	4.98	4.22	6.38
Eastern Asia	13.65	14.36	12.73	9.29	7.21	8.44	9.63	10.75	12.86	14.47	11.94	9.02	7.60	11.02
ASEAN	8.27	7.82	7.07	3.16	2.67	1.71	2.47	2.75	4.37	4.83	4.07	3.76	3.51	3.53

Source: UNCTAD FDI Statistics Online

It has been suggested that a significant explanation for the declining importance of ASEAN as a multinational center of production is the momentous rise of China as a magnet for FDI inflows. In November 2002, the Deputy Prime Minister of Singapore, Lee Hsien Loong (who has since become the Prime Minister of Singapore), commented that “Southeast Asian countries are under intense competitive pressure, as their former activities, especially labor-intensive manufacturing, migrate to China. One indicator of this massive shift is the fact that Southeast Asia used to attract twice as much FDI as Northeast Asia, but the ratio is reversed.”

The awakening of China and its integration in the world economy is the subject of great study. Despite the commonly expressed view of China diverting foreign investment from its Asian neighbors (i.e., the “China effect”), most empirical research concludes otherwise. See for example, Eichengreen and Tong (2007), Chantarasawat *et al.* (2004), Mercereau (2005), and Liu *et al.* (2007), and Plummer and Cheong (2007). These studies all conclude that “being a neighbor to China creates opportunities in addition to competition” (Plummer, 2009).

A secondary factor is the severe dampening impact of the Asian financial crisis of 1997. I discuss the effects of the crisis on ASEAN in detail below.

2.3 Asian Financial Crisis of 1997-1998

The Asian financial crisis of 1997-1998 had a devastating effect on ASEAN economies and FDI flows into the region¹². Returning attention to Table 16, 1998 is clearly a watershed year. By 1998, FDI inflows plummeted in most ASEAN countries and fell on average by more than one third for the region as a whole. In 1997, Indonesia attracted \$4.7 billion in FDI inflows but witnessed an outflow of FDI of \$0.2 billion by 1998. This in part resulted from political unrest which bled into an uncertain investment climate. Malaysian inward FDI fell from \$6.3 billion to \$2.7 billion, or by 57 percent¹³. Inward FDI to Singapore fell from \$13.8 to \$7.3 billion, or by 47 percent in the crisis year. Remarkably, Thai inward FDI increased from \$3.9 to \$7.5 billion by 1998 as foreign investors acquired weakened financial institutions and other real assets. Several small ASEAN nations suffered stagnation or decline in inward foreign direct investment. It took the ASEAN region seven years to reach pre-crisis FDI inflow levels.

The recovery rates vary significantly across ASEAN member countries. It was nearly a decade before Indonesia attracted inward FDI at pre-crisis levels. Malaysia's inward FDI recovered in 8 years while FDI inflows into the city-state of Singapore reached 1997 levels only two years following the crisis. As noted previously, Thailand recovered in less than a year. Throughout this period, inflows to Myanmar and Laos remained quite small.

¹² For a detailed literature review of the 1997-1998 Asian Financial Crisis and its effects on ASEAN see Konan and Bogach, 2010.

¹³ Malaysia's FDI flows fell in part due to the imposition of capital controls.

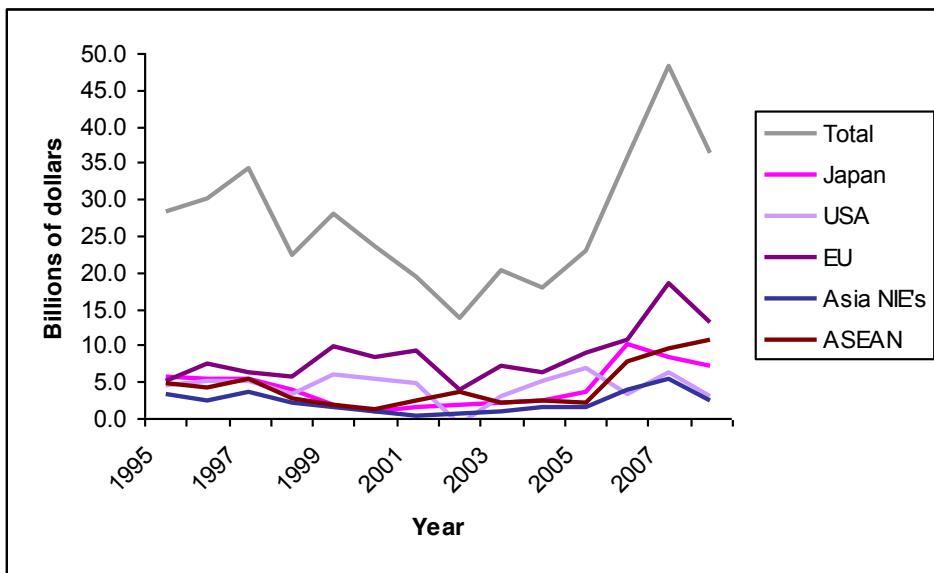
Figure 1 highlights ASEAN FDI changes in the aftermath of the 1997 crisis by source countries (Japan, USA, EU, Asian NIE's, and ASEAN)¹⁴. Total FDI into ASEAN from these countries suffered a 34 percent decline in just one year following the 1997 crisis. It fell from \$34.1 billion in 1997 to \$22.4 billion in 1998. I observe that inward FDI into ASEAN declined most dramatically from the other Asian source countries (Japan, China, and Asian newly industrialized economies (NIE's)¹⁵). It is not surprising as these countries suffered the destabilizing effects of the 1997 crisis more severely than the other source nations of ASEAN FDI. In particular, FDI from Japan to ASEAN fell by 25 percent in just one year - from \$5.2 billion in 1997 to \$3.9 billion in 1998- and continued to decline steadily until 2000. FDI from Asian NIE's declined by \$1.4 billion (or 39 percent) by 1998 and continued to fall until it reached \$0.3 billion in 2001. Similarly, intra-ASEAN FDI shrunk almost by a half as a result of the Asian crisis, from \$5.2 billion in 1997 to \$2.7 billion in 1998. Intra-ASEAN FDI flows did not recover to pre-crisis levels until 2006.

FDI from other source countries suffered more modest declines, but still had negative effects on ASEAN economies. FDI from US to ASEAN fell by 36 percent in the year following the crisis, but quickly recovered to its pre-crisis level in 1999. Inward FDI from EU was virtually unaffected by the Asian crisis suffering only an 11 percent decline in 1998. FDI flows from these developed economies were affected much more severely by the economic slowdown in the US and Europe (and to a smaller extent, the rest of the world) in the aftermath of the dot-com bubble burst which was exacerbated by the tragic events of September 11, 2001. Inward FDI from the US to ASEAN, for example,

¹⁴ The source countries included here constitute about 60-80% of all inward FDI into ASEAN.

declined by 120 percent, from \$4.9 billion in 2001 to \$-1.0 billion in 2002. Similarly, ASEAN FDI from the EU countries fell by almost 60 percent in 2002 compared with the previous year.

FIGURE 1: FDI Flows into ASEAN by Source Country, 1995-2008



Source: ASEAN Secretariat, 2010

Note: The total includes the total from the regions below, which depending on the year constitutes about 60-80 percent of total ASEAN inward FDI

2.4 FDI Cycles Following the Asian Financial Crisis of 1997-1998

Following the methodology of Reinhart and Rogoff (2008b), I construct an estimate of foreign direct investment (FDI) cycles for the four ASEAN countries most severely hit by the 1997 crisis: Indonesia, Malaysia, Philippines, and Thailand. I obtain quarterly data on FDI inflows into these countries from the International Financial Statistics (IFS) Database (IMF, 2009). The historical average in Table 18 includes 8 countries which experienced a financial crisis during the period of 1899 to 2001:

Argentina (2001), Colombia (1998), Spain (1997), Norway (1899), Finland (1991), Sweden (1991), Japan (1992), and South Korea (1997).

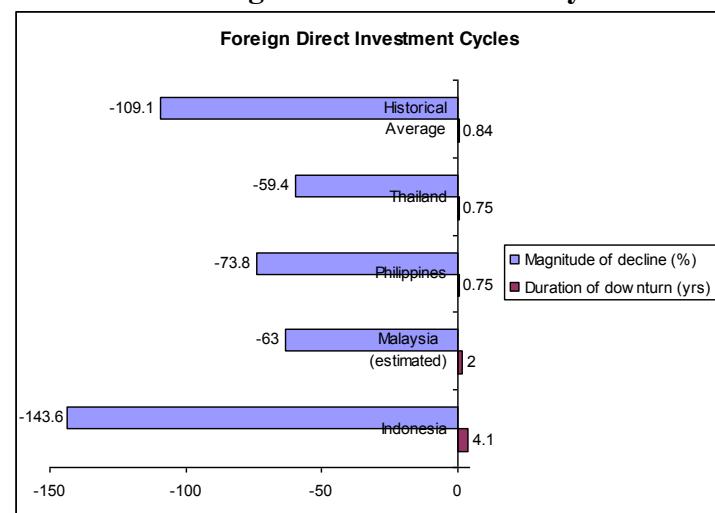
TABLE 18: Foreign Direct Investment Cycles

Country	Crisis date	Peak	Trough	Duration of downturn	Magnitude of decline (in percent)
Indonesia	Q2 1997	Q1 1997	Q2 2001	4.1	-143.6
Malaysia (estimated)	Q2 1997	1996	1998	2	-63
Philippines	Q2 1997	Q1 1997	Q4 1997	0.75	-73.8
Thailand	Q2 1997	Q2 1998	Q1 1999	0.75	-59.4
Historical Average	1899-2001			0.84	-109.1

Source: IMF (2009) and authors' calculations

Table 18 and Figure 2 report that in Malaysia and Indonesia, the downturn in FDI inflows lasted longer than the historical average (2 years and 4.1 years respectively). Moreover, Indonesia's FDI inflows declined the most out of ASEAN crisis countries, and longer than a historical average of .84 years. Philippines and Thailand are slightly below historical average with the duration of downturn of .75 years each.

FIGURE 2: Foreign Direct Investment Cycles Following the 1997 Asian Crisis



Source: IMF (2009) and authors' calculations

2.5 National Policy Responses

As outlined by Corden (2007) and Kim and Haque (2002), three policy responses were pursued in each of the crisis-hit countries. First, as advised by the IMF, countries raised domestic interest rates to moderate depreciation. Second, ASEAN governments proceeded to close many ailing banks and bought non-performing loans through asset management companies in an attempt to rescue the private banks and save the financial system. Indonesian bank restructuring was later referred to as “the most expensive bailout in world history” as its cost was estimated to be US\$75 billion (*The Economist*, 2003). Third, countries pursued domestic demand expansion by increasing public expenditure to help the poor.

Despite pursuing similar objectives, each country had unique aspects which influenced the effectiveness of its policies and actions in responding to the crisis. Thailand, for example, displayed the disadvantages of a fixed-but-adjustable (FBAR) exchange rate regime more than any other ASEAN country hit by the crisis. Malaysia was fortunate among ASEAN nations as it did not have a currency mismatch problem¹⁶. Effective regulations administered by the Malaysian central bank set ceilings on foreign currency borrowing or lending. As a result, the crisis and depreciation of the Malaysian currency created no foreign debt and thus no IMF intervention was required. In 1998 the Malaysian government also imposed controls on short-term capital outflows in particular, on repatriation of portfolio capital by non-residents. After a year these capital controls were modified, but they intensified the impact of fiscal and monetary crisis interventions

¹⁶ A currency mismatch occurs when residents of a country are not adequately hedged against a change in the exchange rate so that a large depreciation generates a large fall in the economy’s net worth, usually accompanied by a large fall in output and insolvencies on the part of firms and banks.

allowing domestic interest rate to fall below US interest rate. Thus, Malaysian economic recovery preceded other ASEAN nations, including Thailand.

Indonesia had the biggest exchange rate and GDP decline and the slowest recovery to the 1997 crisis. Why? At first glance, its initial economic position appeared to have had fewer problems than other ASEAN countries. However, as Hill (2000) notes this was only an “appearance” because inadequate data did not reveal problems of excessive and unwise investment. What made recovery so slow in Indonesia is the concurrence of economic crisis and an impeding political crisis, the uncertain succession of elderly President Soeharto and his declining ability to manage the country. Efforts to rescue Indonesian banks were financed by money creation, and this exacerbated the currency depreciation. Having lost control of its monetary policy, inflation in Indonesia was not brought under control until late 1998. The extreme currency depreciation and severe currency mismatch problems were caused by a loss of confidence in the government of President Soeharto. In sum, the effects of the Asian financial crisis were much more severe in Indonesia because the financial crisis had triggered a political crisis which in turn contributed to a worsening of the economic problem.

3. Impact of Asian financial crisis on ASEAN FDI: Empirical investigation

In this section, I thoroughly and empirically examine the effects of the Asian financial crisis on ASEAN-4 and compare them to the historical averages for the Asian region as well a broad sample of 40 developing countries. Historical data cover annual observations for the 1987-2010 period.

An important contribution of this paper is that I distinguish between the different types of financial crises and the different forms of FDI. I expect different types of FDI to react differently to financial turmoil, and therefore distinguish between different types of FDI—i.e., Mergers and Acquisitions (M&A) and Greenfield investments—and between different motivations for FDI—horizontal (tariff jumping) and vertical (integrating production stages). In addition, I add a more granular detail about the types of financial crises and their potentially differential effects on FDI. The intuition behind distinguishing between different types of crises is that they have different consequences for the domestic economy. In particular, some will lead to domestic contractions (maybe even deep recessions), while others may lead to an expansionary depreciation. Equally, a financial/monetary crisis may not have much impact on the real economy and therefore fail to affect the incentives faced by international investors. These different outcomes will potentially also impact distinctively the differing forms of direct investment; with the relative attractiveness of investing in existing infrastructure, through M&A, relative to constructing new production facilities (greenfield investment) may be shifting as well.

These distinctions also relate to the different time horizons that M&A and greenfield investment entail. M&A can typically be implemented much more quickly, since it does not entail a time-consuming permitting stage that typically accompanies new projects (especially in emerging markets). If a crisis is predicted to be short-lived, and especially if a real depreciation is perceived to be temporary, an M&A boom, as compared to an increase in greenfield investment, is likely to be observed.¹⁷

¹⁷ See Chapter 1 of this dissertation for a detailed discussion of these hypotheses and a thorough review of related theoretical and empirical literature.

Following the literature, I also distinguish between horizontal and vertical FDI (Aizenman and Marion, 2004). I examine the hypothesis that the differences between the motivations for FDI also matter for their vulnerability to financial crises. Horizontal FDI targets the domestic market (or maybe neighboring markets), so that a financial crisis that entails a real contraction will adversely affect horizontal FDI. Vertical FDI, on the other hand, is mostly concerned with production costs (and production quality); in this case a real depreciation may be very beneficial for integrating production networks vertically by reducing the costs associated with this process, whatever the state of the domestic/host economy is and will likely remain. Vertical FDI is also more closely associated with increased trade, and therefore can also be affected by the impacts of financial crises on trade relations (Aizenman and Noy, 2006 and 2009). Appendix B describes the crisis typology used in this analysis (largely based on Reinhart and Rogoff, 2009).

Empirically, I employ a country-panel regression approach using Arellano-Bond Generalized Method of Moments estimation (AB-GMM). AB-GMM is by now the standard in the international macro literature that uses country time series panels and I therefore do not include a detailed discussion of the estimation algorithm and its justification. It is worth noting that the algorithm enables us to disregard the time-invariant institutional, legal and cultural environment in which FDI projects are implemented and which may have an important impact on FDI inflows, and also deals with some types of endogeneity (though at least reverse causality is not a major concern in this case as few view FDI as potentially destabilizing for the financial system).

3.1. Data Sources, Descriptive Statistics, and Estimation

In my analysis, I focus on ASEAN-4 (Indonesia, Malaysia, Philippines, and Thailand) and thoroughly examine the evolution of FDI around the Asian financial crises in these countries (1996-2000). The selection of ASEAN-4 is motivated by the availability of data and the fact that these countries were most severely effected by the AFC. I then compare ASEAN-4 to a sample of 10 Asian countries and a broad sample of developing countries. The full sample contains 40 emerging/developing countries (a detailed list is included in the Appendix A). The data cover yearly observations for the 1987-2009 period. Appendix C contains a full list of data sources.

M&A, greenfield, horizontal and vertical FDI

Given a lack of common source for FDI data, I collected data on four different FDI measures that have been typically used in previous studies: FDI flows, FDI stocks, Mergers and Acquisitions (M&A), and foreign affiliate sales.

My source of cross-country FDI flows, stocks, and cross-border mergers and acquisitions (M&A) is UNCTAD's FDI database, compiled by Thomson Financial. UNCTAD classifies foreign direct investment as an “investment involving a long-term relationship and reflecting a lasting interest and control by a resident entity in one economy of an enterprise resident in a different economy” (UNCTAD, 2009). M&A are defined as the mergers with, or acquisitions of, domestic firms by a single foreign investor with more than ten percent equity capital. Data on cross border M&A have been used in such studies as Rossi and Volpin (2004) and Head and Reis (2008). One

limitation of this dataset is a substantial amount of missing values, and possibility of significant underreporting, since many of the transactions are between private firms.

Following Calderon *et al.* (2004) and Wang and Wong (2009), I construct a measure of greenfield FDI by subtracting cross-border M&As from FDI inflows. While this proxy is not ideal, UNCTAD documents that FDI can be considered approximately as the sum of greenfield investment and M&As (UNCTAD, 2000, p.114-119)¹⁸.

To distinguish between horizontal and vertical FDI, I use the destination market for the sales of U.S. multinationals since 1987 (data from the U.S. Bureau of Economic Analysis). Following Hanson *et al.* (2002) and Aizenman and Marion (2004), I measure vertical investment as affiliate sales either back to the U.S. or to other foreign countries. Horizontal investment is defined by affiliate sales in the local market where the affiliate resides. The assumption is that the latter are sales of final goods, while the former represent intermediate goods requiring further processing in the parent country or a third country. This is the best available metric to distinguish between horizontal and vertical FDI. Moreover, several studies (e.g., Carr, et al., 2001, and Bergstrand and Effer, 2007) have stressed the use of affiliate sales as the most appropriate measure of actual multinational firm activity in a host country.

Typology of crises and data sources

The literature on financial crises is quite large, but only in the last few years a typology of crises has become used more often, especially since the publication of the

¹⁸ Given the lack of existing greenfield investment data, this measure is the most natural alternative proxy. However, since FDI data are reported on a balance-of-payment basis, where inward FDI in a host country is measured as the aggregation of greenfield investment, M&A sales, re-investments, and disinvestments undertaken by MNCs, this proxy does not perfectly reflect the actual value of greenfield investment.

comprehensive examination of the historical record provided by Reinhart and Rogoff (2009). I follow Reinhart and Rogoff (henceforth R&R) in identifying banking, currency, debt (external and domestic), stock market, and inflation crises. I also distinguish severe crises: systemic banking crises (as identified by bank runs that lead to the closure, merging, or takeover by the public sector of one or more financial institutions), and hyperinflation crises (identified as an annual inflation rate of 500% or higher).

R&R's comprehensive data set on financial crises provides the dating of various types of crises in seventy countries over the period 1970-2010. It builds heavily on the work of earlier scholars, but also employs a considerable amount of new material from diverse primary and secondary sources. I focus on the period of 1987-2009 when FDI became prevalent in the countries in my sample (developing/emerging).

To identify systemic banking crises, I use a database developed by Leaven and Valencia (2010). The database builds on the Caprio, et al. (2005) banking crisis database and covers worldwide systemic banking crises for the period of 1970-2007. Table 19 presents a summary of the data on crisis types. It reports the number of years each ASEAN-4 country was in a particular type of crisis during 1996-2000.

As can be seen from Table 19, ASEAN-4 countries experienced a broad range of crisis types during the Asian financial crisis. Indonesia, in particular, suffered from all, but hyperinflation crisis. Banking crises were widespread in all ASEAN-4 for the entire duration of the AFC, most of which were systemic.¹⁹ Currency crises and stock market crashes were equally prevalent throughout ASEAN-4, albeit relatively short-lived crises episodes. All ASEAN-4 countries were able to avoid an inflation, domestic and external debt crisis except Indonesia.

¹⁹ The Philippines is the only exception, where banking crises were milder episodes.

Table 19: ASEAN-4 and the Asian Financial Crisis
 Number of years in crisis, by country and type of crisis, 1997-1999

Country	Crisis type							
	Banking	Systemic banking	Currency	Inflation	Hyperinflation	Stock market crash	Domestic debt	External default
Indonesia	3	3	2	2	0	2	3	2
Malaysia	3	3	1	0	0	2	0	0
Philippines	3	0	1	0	0	2	0	0
Thailand	3	3	1	0	0	2	0	0
Total ASEAN-4	12	9	5	2	0	8	3	2

Control variables

My main concern in the choice of additional variables to include in my estimation is to prevent any omitted variables bias from affecting the estimates I obtain for my RHS variables of interest (the financial crisis indicators). Given this concern, I choose to err on the side of caution and include an extensive list of controls. Blonigen and Piger (2011) conclude, using Bayesian averaging technique, that a fairly extensive list of controls should be included in FDI regressions, though they also point to a few that are probably not robustly associated with FDI.

Adhering to their findings, I control for broad macroeconomic conditions, political, socio-economic, and business environment in the host country by using a set of indicators on corruption, government stability, and investment climate from the Freedom House and International Country Risk Guide – Political Risk Service (ICRG-PRS) databases. I also include measures from the World Bank’s World Development Indicators (WDI) on relative factor endowments, communications infrastructure, and trade costs. Finally, I control for geographic spatial issues and possible agglomeration effects by using the data from Penn World Tables and CEPII Gravity data set (Head *et al.*, 2010). Additional data sources for my control variables are Barro and Lee (education data set) and Li *et al.* (2011) dataset on per capita real capital.

The list of all controls used in my analyses and the corresponding data sources is included in the Appendix C. For readability, I do not include coefficients for these controls in the reported regressions; complete results are available upon request.

Estimation Methodology

I estimate the following equation:

$$FDI_{it}^T = \beta_1 + \beta_2 CRIS_{it}^P + \beta_3 X_{it} + \varepsilon_{it} \quad (1)$$

Where FDI_{it}^T is the measure of FDI inflows for country i in year t , and of type T (M&A, greenfield, horizontal, vertical), $CRIS_{it}^P$ is the binary crisis indicator for crisis type P , and X_{it} is a vector of control variables as described the previous section. I use panel fixed effects estimation method. Using panel estimation highlights several advantages over a conventional cross-section. Panel estimation methods offer us a way to control for unobservable time-invariant effects and hence give more reliable estimates, while the AB-GMM estimation algorithm allows us to control for potential endogeneity of some of the control variables within the context of a dynamic panel.

3.2. Results

I begin by estimating the effects of Asian financial crises on FDI flows and stocks in ASEAN-4. Table 20 presents the results of fixed effects estimations. Banking crises, which occurred during the AFC are shown to affect M&A investment positively and statistically significantly, consistent with the fire-sale Currency crises also had a positive effect on M&A in ASEAN-4, albeit of a lesser magnitude and statistically insignificant. FDI hypothesis. Other types of crises had a negative effect on M&A and greenfield investment, but all coefficients are statistically insignificant.

When distinguishing between vertical and horizontal FDI, we see that both forms of investment are affected by inflation crisis negatively and these effects are very close in

magnitude to the effects of the external debt crises (both sets of estimated coefficients are statistically significant).

To estimate percentage effects of crises on FDI, I use logged dependent variables and report the results in Table 21. Consistent with Table 20 results, banking crises have a positive effect on FDI flows and stocks. Domestic and debt crises are also shown to increase FDI stocks, but the coefficients on FDI flows are statistically insignificant.

4. Conclusion

The Association of Southeast Asian Nations has become one of the most important organizations in the region. It boasts rapid growth, openness and rapid integration into the world economy as an important trade partner in Asia. Most importantly, however, is ASEAN's role as a vital host for foreign direct investment. The attraction of FDI inflows has become one of the explicit goals of the ASEAN Economic Community (AEC). As noted by Plummer and Cheong (2007), "the diversity of economic structure in the ASEAN region makes it a particularly strong candidate for investment cooperation." However, problems still remain. Among the most widespread are corruption, insufficiently educated labor force, and inefficient government bureaucracy. Moreover, the growth in ASEAN FDI could have been even more remarkable had it not been for two important economic downturns – the Asian crisis of 1997 and the 2007 global economic recession.

Despite important differences, both the Asian Financial Crisis and the recent global downturn have had similar destabilizing effects on the ASEAN economies and on FDI inflows. We see that ASEAN crisis-struck countries were each affected in their own

Table 21a: Impact of Asian financial crises on FDI in ASEAN, by FDI type.
 Coefficients from FE estimations for ASEAN-4 (in millions of real \$US)

Crisis type	Form of FDI			
	M & A	Greenfield	Horizontal	Vertical
Banking crisis	587.46** (276.78)	-280.64 (645.82)	571.18 (844.57)	463.05 (1,583.14)
Systemic banking crisis	93.11 (315.16)	652.64 (698.84)	-265.56 (938.61)	-286.92 (1,756.42)
Inflation crisis	-629.35 (630.06)	-669.64 (1,419.72)	-3,943.16** (1,788.54)	-8,751.79*** (3,218.99)
Currency crisis	317.38 (352.40)	-776.73 (786.44)	78.61 1,083.60	-1,160.6 (2,029.44)
Stock market crisis	470.15 (298.52)	-715.04 (676.52)	33.47 (926.18)	-676.19 (1,731.06)
Domestic debt crisis	-551.84 (554.98)	-191.55 (1,253.02)	-2,256.89 (1,551.69)	-5,960.64** (2,816.69)
External debt	-629.35 (630.06)	-669.64 (1,419.72)	-3,943.16** (1,788.54)	-8,751.79*** (3,218.99)
Number of observations	64	64	72	76
Number of countries	4	4	4	4

* denotes 10% significance, **5% significance, ***1% significance

One-step standard errors in parentheses

Table 21b: Impact of Asian financial crises on FDI in ASEAN, by FDI type.
 Coefficients from FE estimations for ASEAN-4 (with logged dependent variable)

Crisis type	Form of FDI					
	FDI Flow	FDI stock	M&A	Greenfield	Horizontal	Vertical
Banking crisis	.29 (.26)	.38** (.15)	-.24 (.63)	-.15 (.24)	.39 (.24)	.21 (.42)
Systemic banking crisis	.39 (.29)	.38** (.17)	-1.06 (.68)	.02 (.25)	.33 (.27)	.34 (.47)
Inflation crisis	-	.77** (.33)	-.13 (1.4)	-	.18 (.54)	-.46 (.91)
Currency crisis	-.17 (.35)	.08 (.68)	-.99 (.76)	.13 (.33)	.17 (.31)	-
Stock market crisis	.07 (.29)	.22 (.17)	-.68 (.63)	-.25 (.27)	.32 (.27)	.12 (.54)
Domestic debt crisis	.24 (.73)	.74** (.28)	-.13 (1.4)	.17 (.62)	.21 (.46)	.07 (.46)
External debt	-	.77** (.33)	-.13 (1.4)	-	.18 (.54)	-.04 (.78)
Number of observations	67	76	64	64	72	76
Number of countries	4	4	4	4	4	4

* denotes 10% significance, **5% significance, ***1% significance

One-step standard errors in parentheses

Finally, I compare the effects of the Asian financial crises on ASEAN-4 FDI to the historical effects of crises on Asian region and developing countries in general. To be consistent with the portfolio allocation literature and to avoid a potential size and significance bias²², I scale dependent FDI variable by a country's GDP level. The effects of crises on the scaled FDI flows remain robust, although some statistical significance

²² See Ammer, et al. (2012) for a discussion on the importance of scaling and for examples, and Bekaert, et al. (2012) for an econometric analysis.

way and took significantly different amounts of time to recover from the Asian crisis of 1997.

In the decade since the Asian crisis, we have witnessed a remarkable economic renewal in the region. ASEAN has reemerged as one of the most dynamic regions in the world. It appears that the 1997 crisis was a trigger that brought ASEAN regionalism to a new level. Policy makers realized that by joining together they can turn the crisis into opportunity. They spent the following decade strengthening intra-regional cooperation through initiatives like AFTA, AIA, and ACIA. One area of future research is to examine whether ASEAN regional integration has outpaced global integration in the decade following the Asian crisis. Moreover, the effects of ASEAN regional integration on FDI inflows into the region still remain to be quantified.

Chapter 3: An Experimental Study on the Relevance and Scope of Nationality as a Coordination Device

1. Introduction

The beginning of the new millennium has been marked by increased social, economic, technological, and cultural integration. These phenomena, in turn, promote contact between individuals from different countries and cultural backgrounds putting higher demands on the coordination of actions.²⁰ In this context, it is important to understand if and how coordination depends on the cultural backgrounds of the participating actors. One stylized fact in the economic literature on coordination is that in the absence of additional information, people tend to use a solution that seems relevant, natural, or special to them. This solution is known as a focal point (Schelling, 1960; Crawford and Haller, 1990; Mehta *et al.*, 1994; Sugden, 1995; Camerer, 2003). Nationality may be such a focal point and hence one may hypothesize that nationality serves as a coordination device and that miscoordination is more likely to occur if interactions take place between partners from different nationalities (Schelling, 1960; Sugden, 1986).

I investigate whether and under which circumstances nationality serves as a coordination device in coordination games with multiple equilibria (Crawford and Haller, 1990; Cooper *et al.*, 1990; Van Huyck *et al.*, 1990; Crawford, 1995). For this purpose I made use of the diverse student body at the University of Hawaii and recruited an equal number of Japanese, Korean, and Chinese nationals. The subjects play simple stag-hunt coordination games with a payoff-dominant and a risk-dominant equilibrium, and interact

²⁰ We use the term culture, cultural background, and nationality interchangeably in this paper. For a survey on the different definitions for culture consult e.g. Kroeber and Kluckhorn (1952). Culture certainly has many meanings and nationality is just one aspect of it, albeit an important one. We use nationality as a proxy for culture and discuss the strength of this proxy and other aspects of culture in the conclusion.

both with their compatriots and participants from the other two countries. To test for the robustness of the relevance of nationality as a focal point, I provide subjects with different levels of information about their partner: (i) no information, (ii) information only about their partner's nationality (i.e. nationality is salient), and (iii) information about their partner's nationality and some other presumably irrelevant characteristics such as hair color (i.e. I make nationality non-/ less salient). In addition, I observe the subjects' level of pro-sociality towards subjects from other nationalities and compatriots in ultimatum and dictator games to investigate whether potential differences in coordination are driven by in-group favoritism (Tajfel and Turner, 1979).

My findings show that nationality can indeed serve as a coordination device. Subjects are more likely to try to coordinate on the payoff-dominant equilibrium if common nationality is salient as compared to if subjects do not know the nationality of their partner. However, if nationality is non-salient, nationality does not serve as a coordination device, i.e., subjects are not more likely to try to coordinate on the payoff-dominant equilibrium if their partner has the same nationality. Moreover, I do not find that subjects try to coordinate on the payoff-dominant equilibrium less if their partner has a different nationality as compared to when the partner's nationality is unknown. Interestingly, I also find that giving the subjects information about their partner in general increases the risk of miscoordination. Efferson, *et al.* (2008) provide one reason nationality may matter as a coordination device in strategic settings with multiple equilibria. They show that people have a willingness to express in-group favoritism, particularly when trivial groups evolve into cultural groups.

To the best of my knowledge, this is the first experimental paper studying inter-cultural coordination between different nationalities in a systematic manner and inter-cultural behavior where the salience of nationality is experimentally manipulated. Probably the closest related study is Brandts and Cooper (2007) who compare the behavior of subjects in the USA and Spain and observe higher levels of coordination in the USA. This study, however, does not investigate coordination between subjects from different nationalities. Related to my findings is also the study by Crawford *et al.* (2008) in which the authors find that miscoordination increases if the salience of focal points is reduced by minimally changing payoff constellations, and Holm (2000) who finds that information about gender affects coordination in a battle-of-sexes game.

My paper contributes not only to the literature on coordination games which are characterized by the existence of multiple Nash equilibria (Crawford and Haller, 1990; Cooper *et al.*, 1990; Van Huyck *et al.*, 1990; Crawford, 1995) but also to the literature comparing behavior across cultures (Roth *et al.*, 1991; Okada and Riedl, 1999; Anderson *et al.*, 2000; Henrich, 2000; Henrich *et al.*, 2001; Brandts *et al.*, 2004), between cultures (Fershtman and Gneezy, 2001; Buchan *et al.*, 2006; Chuah *et al.*, 2007; Bornhorst *et al.*, 2008) and more generally to the literature on in- and out-group behavior (Sherif *et al.*, 1961; Tajfel and Turner, 1979; Kollock, 1998; Eckel and Grossman, 2005; Goette *et al.*, 2006; Charness *et al.*, 2007; McLeish and Oxoby, 2007; Chen and Li, 2009) which typically reports that individuals treat in-group members better than out-group members.

Most of these studies do not manipulate the salience of group membership. Exceptions are Eckel and Grossman (2005) and Charness *et al.* (2007), which create minimal groups to study cooperation and increase group identity by team goal attainment

or passive audiences. Consistent with my findings, these two studies point out that the saliency of group membership affects behavior. In contrast to these studies, I investigate *coordination* among *natural groups* of people with different nationalities. Moreover, I *decrease* group identity by providing subjects with different levels of information about their partners.

2. Experimental Design

The inter-cultural coordination experiment consists of four parts: (1) a short pre-experimental questionnaire to collect the subjects' nationality and some demographic information, (2) instructions and control questions for the games (the complete set of experimental instructions and questionnaires is given in the Appendix), (3) the games, (4) a short post-experimental questionnaire.

All subjects first took part in three ultimatum games and three dictator games before they played three coordination games. Each game was presented to the subjects separately and they received *no information* about the behavior of other subjects or the outcomes of the games until the end of the whole experiment. The roles always remained the same throughout the experiment, i.e., a subject who was assigned a role of a proposer in the ultimatum game, was also a proposer in the dictator game. Players were *randomly paid* for one of the three ultimatum games, one of the three dictator games, and one of the three coordination games. In addition, I used the *perfect stranger matching*, so no player knew the identity of his co-player and no player was ever matched with the same player twice. Therefore, there is no theoretical reason to believe that the behavior in the

coordination games is contaminated by the preceding games.²¹ I focus on the behavior in the coordination games and mainly use the behavior in the other games to facilitate the interpretation of my coordination findings.

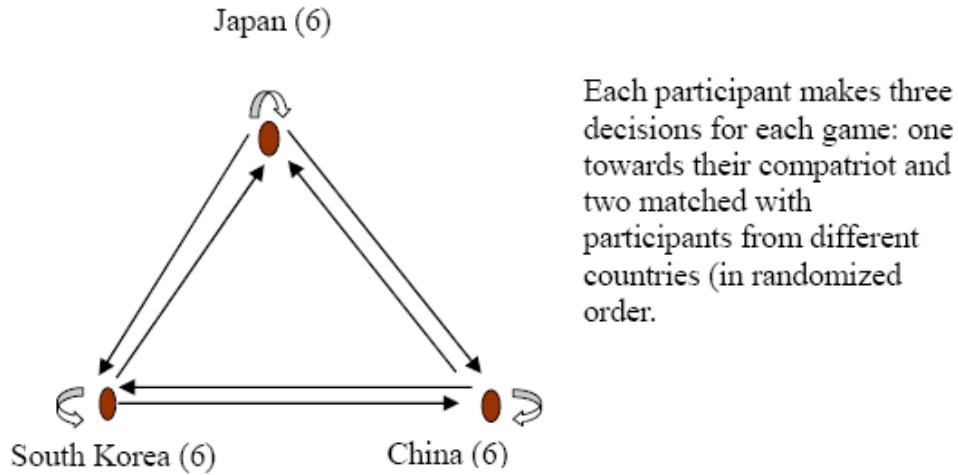
By taking into consideration the behavior in the ultimatum and dictator game, I can control for the possibility that the treatment differences in the coordination game are driven by some type of in-group favoritism. This strengthens the interpretation of the coordination findings that nationality can function as a coordination device because it constitutes a focal point. The necessity to conduct multiple games in one session was motivated mainly by the unique subject pool in this experiment. The nature of the experiment required an equal number of subjects of three different nationalities to be present in one session at a time. It would be extremely difficult to find a sufficient number of participants from different nationalities if I had to avoid a multi-game design. My multi-game design was also motivated by the many recently published experimental studies using multi-game designs.

The three coordination games (as well as the three ultimatum and dictator games) differ according to the matching and were presented in random order. In one decision, a subject was matched with a person from the same nationality, and in the other two she was matched with subjects from other nationalities than her own nationality. The matching algorithm is presented in Figure 3.²²

²¹ In principle, there could be order effects, i.e. subjects may in general play a coordination game differently after playing e.g. a dictator game. However, because our main analysis compares treatments where the order was identical, our treatment differences cannot be subject to order effects. We briefly examine relationships between ultimatum game, dictator game, and coordination game behavior in a later section.

²² The experiment was programmed using Z-tree software (Fischbacher, 2007).

Figure 3: Matching Algorithm



(6) represents a number of participants from each nationality present in a session

There are three across-subject treatments in this experiment which differ by the amount of information subjects know about their matched partners: control (treatment C), salient information about partner's nationality (treatment S), and non-salient information about partner's nationality (treatment NS). In C, a subject receives no information about her partner. In S, the only piece of information a subject receives is the nationality of her partner. In NS, a subject receives information about the age, status at UH (freshman, sophomore, junior, senior or graduate student), eye color, hair color, and nationality of her partner. No subject participated in more than one treatment.

The coordination game I study is a symmetric two-person stag-hunt game in which the subjects simultaneously choose either A or B. The earnings are determined depending on their choice and the choice of their match according to the payoff matrix presented in Table 24. For example, if participant 1 chooses A, then participant 2 gets seven tokens if she chooses A and one token if she chooses B. Each token is worth one dollar if the game is chosen for payment. Note that choice B is riskier for the subject as she could make

either one or nine tokens depending on the choice of her match. In contrast, choice A is less risky as it secures at least seven tokens regardless of the other subject's decision. There are two Nash equilibria in this game: (A,A) which is the risk-dominant equilibrium, and (B,B) which is the payoff-dominant equilibrium. Charness (2000) studies this game with the same parameter specifications.

Table 22: Payoff Matrix in Coordination Game

		subject 2	
		A	B
subject 1	A	7,7	8,1
	B	1,8	9,9

In the ultimatum games a proposer has to decide how to divide ten tokens between her and a responder. If the responder accepts, the offer is implemented; however, if she rejects both player types receive zero tokens. I implemented the strategy method for the responders, i.e. the responder had to determine her minimal acceptable offer before she knew the actual offer of the proposer. In the dictator games, the proposer has also to decide how to divide ten tokens between her and a responder but the responder cannot reject the offer.

A total of seven sessions were conducted in the UH Experimental Laboratory in April 2009 (two sessions for treatments C and NS each, three sessions for treatment S²³). Sessions typically included 18 participants: 6 Japanese, 6 Korean, and 6 Chinese

²³ We had to conduct an extra session for the S treatment due to an insufficient number of Korean participants present at one of the previous sessions.

students. A total of 126 subjects participated in the experiment (42 Japanese, 38 Korean, 42 Chinese, and 4 other nationalities).²⁴ These nationalities were chosen due to their significant representation at University of Hawaii as well as their close regional economic ties. Choosing participants from the same region allows eliminating possible cross-regional factors that may affect subjects' behavior and potentially contaminate the results of the experiment.

68 percent of the subjects are female. 57 percent identify themselves very strongly with their nationality, 41 percent somewhat, and 2 percent not at all. 55 percent report to have a GPA of 3 (= mean grade in their university classes, 4 is the best). With regard to the information subjects receive about their partner in the NS treatment I observe that 55 percent have black and 44 percent brown eyes, 86 percent have black and 13 percent brown hair. The mean age is 25 years. 38 percent are graduate, 25 percent are senior, 21 percent junior, and 16 percent sophomore and freshman students. Each subject participated in only one session. Sessions lasted approximately 45 minutes and the subjects earned on average \$13 (\$5 show-up fee, plus their earnings from the experimental sessions). Table 25 presents summary statistics of the sessions.

²⁴ Subjects were recruited with campus flyers and e-mail announcements. Interested individuals were asked to fill out socio-demographic information as well as to report their nationality. We invited only individuals who reported to be Japanese, Korean, or Chinese. However, during the experimental sessions four participants answered in the pre-experimental questionnaire to be of another nationality (one participant in NS and three participants in S). Accordingly, in our analysis we exclude these participants and the participants that were matched with these in the S and NS treatments. More precisely, we excluded from our analysis three observations in NS and nine observations in S. None of the subjects analyzed in our results had a dual nationality. Upon entering the laboratory, subjects were not allowed to talk to each other.

Table 23 : Experimental Design

Treatment	Number of observations in coordination game
Control (C) (no information)	J-J: 11 K-K: 11 C-C: 11 J-K: 21 J-C: 22 K-C: 22
Total observations:	108
Salient (S) (subjects know only their partner's nationality)	J-J: 18 K-K: 12 C-C: 18 J-K: 30 J-C: 36 K-C: 30
Total observations:	144
Non-salient (NS) (Subjects know their partner's age, status at UH, eye color, hair color, & nationality)	J-J: 12 K-K: 10 C-C: 12 J-K: 22 J-C: 24 K-C: 22
Total observations:	102

J: Japanese, K: Korean, C: Chinese and treatments as:

C: Control, NS: Non-salient, and S: Salient

3. Results

Across all nationalities and treatments I find that in the coordination games, the risky alternative B was chosen with a probability of 0.441 (156 out of 354 times). There are no statistically significant differences in the mean probability to choose B among nationalities. 46.7 percent of the Japanese choose B, which is statistically insignificantly more than Chinese (44.3 percent; Fisher's exact test, $p = 0.797$, two-sided) or Korean (40.9 percent; Fisher's exact test, $p = 0.427$, two-sided). 18.1 percent of the pairings

achieve the payoff dominant equilibrium (B, B) (with payoff of (9,9)), 29.9 percent the risk dominant equilibrium (A, A) (with payoff of (7,7)), and 52 percent miscoordinate, i.e. the outcomes are either (A, B) (payoff (1,8)) or (B, A) (payoff (8,1)).

In the control treatment, I observe that 42.6 percent choose B (Japanese: 47.2 percent, Chinese: 41.7 percent, Korean: 38.9 percent). In the salient treatment, 45.8 percent choose B (Japanese: 47.1 percent, Chinese: 41.2 percent, Korean: 50 percent), and in the non-salient treatment 43.1 percent (Japanese: 45.7 percent, Chinese: 51.4 percent, Korean: 31.5 percent).

In the dictator games, the mean token amount sent is 3.26 (treatment C = 3.33, S = 3.00, NS = 3.55). In the ultimatum games, the mean token amount sent is 4.75 out of 10 (treatment C = 4.62, S = 5.12, NS = 4.33) and the mean minimal acceptable offer is 3.12 (treatment C = 3.13, S = 3.35, NS = 2.78). The mean individual behavior in the three coordination games is not significantly correlated to the mean individual behavior in the three dictator games ($r = 0.059$, $p = 0.654$), the mean individual proposer behavior in the ultimatum games ($r = 0.194$, $p = 0.138$) or the mean individual minimal acceptable offer in the ultimatum games ($r = 0.073$, $p = 0.574$). Table 26 summarizes the means of all three treatments under the two different matchings (same or different nationalities) for the coordination, ultimatum, and dictator games.

Table 24: Behavior in Ultimatum, Dictator, and Coordination Game (means, N)

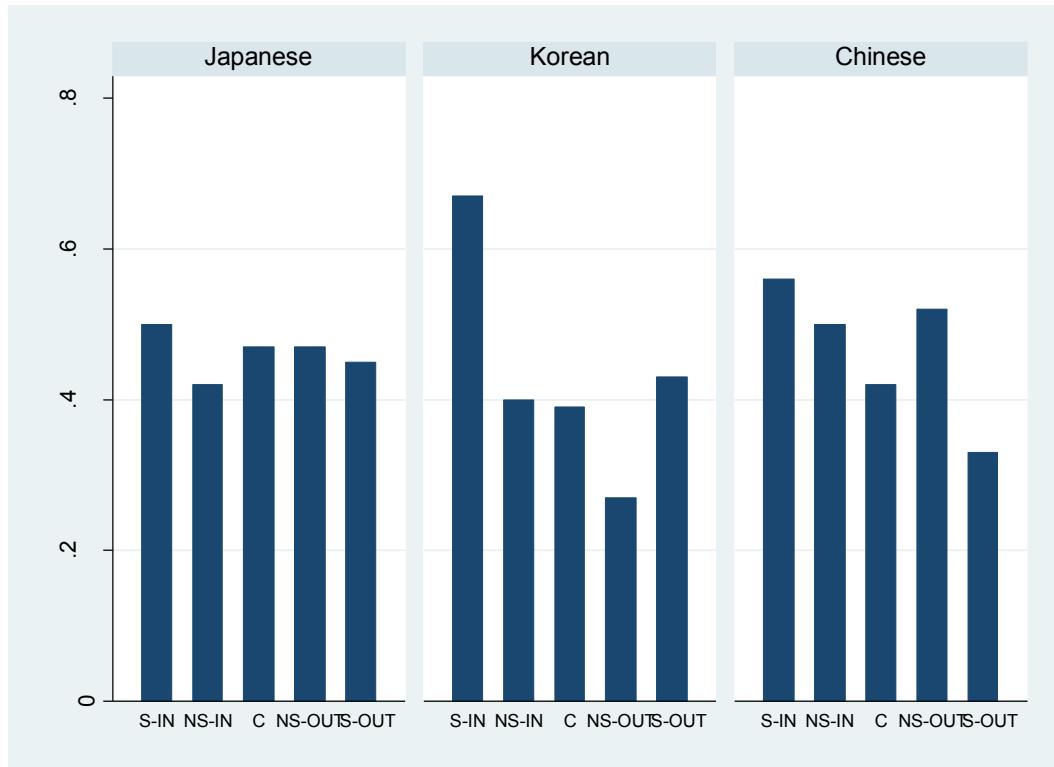
	C - Treatment	S – Treatment		NS – Treatment	
		different	compatriot	different	Compatriot
proposer	4.62	5.06	5.25	4.38	4.28
(offer)	<i>53</i>	<i>48</i>	<i>24</i>	<i>32</i>	<i>18</i>
responder	3.13	3.27	3.50	3.00	2.35
(MAO)	<i>53</i>	<i>48</i>	<i>24</i>	<i>33</i>	<i>17</i>
dictator	3.33	2.83	3.32	3.65	3.35
(offer)	<i>54</i>	<i>48</i>	<i>25</i>	<i>34</i>	<i>17</i>
coordination	0.43	0.41	0.56	0.43	0.44
(probability B)	<i>108</i>	<i>96</i>	<i>48</i>	<i>68</i>	<i>34</i>

Note: Italic numbers are number of observations. Bold numbers indicate significant differences. In some cells are odd numbers because I excluded observations whenever a participant was matched with someone whose nationality is not Chinese, Korean, or Japanese. In all reported observations, the matching was between these three nationalities.

Conjecture 1: Nationality serves as a coordination device if nationality is salient.

I observe that 56.3 percent of the subjects (27 out of 48) choose B in treatment S if they know that their partner has the same nationality. This percentage is considerably higher than the equivalent percentage in the control treatment C (46 out of 108; 42.6 percent; $p = 0.057$, $\chi^2 = 2.49$, one-sided); i.e., subjects are approximately 33% more likely to attempt to coordinate on the Pareto-efficient outcome if their partner has the same nationality. This finding is significant at $p = 0.025$ after controlling for the subject's nationality, her level of identity with her nationality, GPA and gender (Table 25, model 1). Identity and GPA predict positively the choice to play B ($p < 0.062$). Model 1 also shows that both Korean and Chinese students tend to be less likely to choose B in treatment C ($p < 0.144$).

Figure 4: Choice to try to coordinate on payoff-dominant equilibrium depending on treatment and nationality



Notes: S-IN: Treatment S, subject is paired with compatriot; NS-IN: Treatment NS, subject is paired with compatriot, C: Treatment C, subject does not know nationality of partner, NS-OUT: Treatment NS, subject is paired with partner from a different nationality, S-OUT: Treatment S, subject is paired with partner from a different nationality.

Figure 4 illustrates that the strength of the coordination device (i.e., the information that the partner is a compatriot) depends on the nationality. I observe that the probability that subjects play B is highest in the treatment condition S-IN (treatment S, partner is compatriot) for all three nationalities. However, for Japanese subjects salient information about the partner being Japanese has very little impact on the willingness to choose B as compared to having no information about the partner's nationality in treatment C (50 vs. 47.2 percent). In contrast, Korean subjects are more likely to choose B when paired with another Korean (66.7 vs. 38.9 percent; $p = 0.047$, $\text{Chi}^2 = 2.80$, one-sided). Chinese

subjects are more likely to choose B when paired with another Chinese, although this results is statistically insignificant (55.6 vs. 41.7 percent; $p = 0.167$, $\text{Chi}^2 = 0.93$, one-sided).

Figure 5: Payoff Outcomes in Coordination Game across Treatments

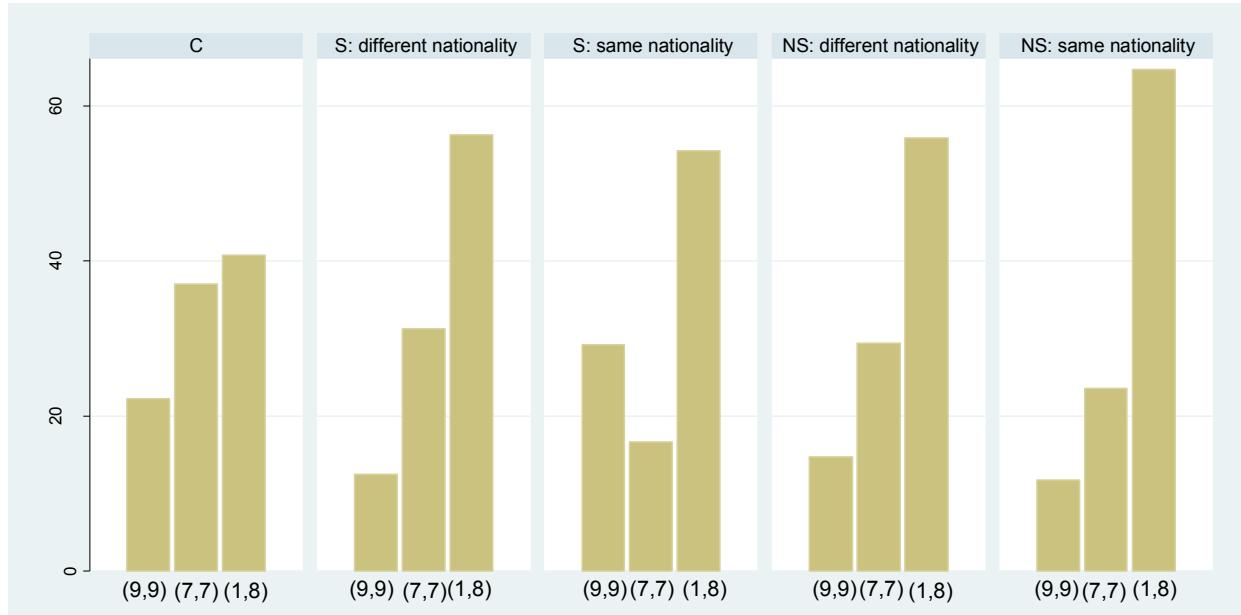


Figure 5 provides an overview of the outcomes in all treatments and distinguishes between the payoff outcomes (9,9), (7,7), and (1,8) (which includes (8,1)). This figure illustrates that the more pronounced willingness to coordinate on the payoff-dominant equilibrium leads to more payoff-dominant outcomes (7 out of 24 or 29.2 percent) when matched with someone from the same nationality than in C (12 out of 54 or 22.2 percent). It also leads to less coordination on the risk-dominated equilibrium than in C (16.7 vs. 37 percent) and when matched with someone from a different nationality in S (31.3 percent). Later in finding 4 I will analyze in more depth the level of miscoordination in my treatments.

Interestingly, I do not find that subjects behave consistently more pro-socially towards their compatriots in the ultimatum and dictator games in my subject pool. One possible explanation may lie in the dual nature of culture in this experiment. While nationality certainly comprises one aspect of culture, it does not represent the full extent of it. Besides being nationals of three different countries, subjects in this experiment are all students of University of Hawai‘i and are united by a university culture and their common Asian heritage. As international students, they may perceive each other as members of the same group, rather than outsiders. This common culture may explain why I do not find significant in-group favoritism in the dictator and ultimatum games. For example, in treatment S the mean transfer in the dictator game to a compatriot (3.32) is almost identical to the mean transfers in treatments C (3.33).²⁵ This suggests that my finding that compatriots are more willing to coordinate on the payoff-dominant equilibrium is *not* primarily driven by a propensity – or a potential experimental demand effect – to behave more pro-socially towards compatriots. However, I find differential treatment in the ultimatum game on the side of the proposer: The mean offer in treatment S to a compatriot (5.25) is higher than the mean offer in treatment C (4.62, $p = 0.069$, Mann-Whitney, two-sided).²⁶ On the side of the responder I find that the minimal acceptable offer is statistically insignificantly higher in treatment S when paired with a compatriot as compared to treatment C (3.5 vs. 3.13, $p = 0.326$, Mann-Whitney test).

²⁵ Note also that if we only look at Koreans – in whom the propensity to coordinate with a compatriot is most pronounced – we also find no such statistically significant differences. In the dictator game, Koreans even give more in treatment C (3.73) than to compatriots in treatment S (3.17).

²⁶ This finding is in line with the finding in Chuah et al (2007) who find that Malaysian Chinese subjects gave on average higher offers in the ultimatum game to compatriots as compared to subjects from the United Kingdom. Note that there are procedural differences between my study and their experiment. In particular, Chuah et al. conducted their experiments in their subjects’ respective home countries (Malaysia or United Kingdom) whereas I conducted my experiments outside the subjects’ home countries.

Finding 1: *I find evidence that nationality serves as a coordination device if nationality is salient: Subjects are more likely to try to coordinate on the payoff-dominant equilibrium if matched with someone from the same nationality. The strength of this coordination device depends on the nationality.*

Conjecture 2: Nationality also serves as a coordination device if nationality is non-salient.

44.1 percent (15 out of 34) subjects choose B if they play with someone from the same nationality in treatment NS. This percentage is not statistically different from the percentage in the control treatment (42.6 percent). Note also that none of the other pieces of information that I gave subjects about their partner in the NS treatment (age, status, hair color, eye color) is significantly related to the choice of B ($p > 0.33$, Spearman). Table 27, model 2 shows that even after controlling for my co-variates, subjects are not more likely to choose B when matched with a compatriot in NS ($p = 0.987$).

In Figure 5 I observe a low fraction of payoff-dominant outcomes in treatment NS when paired with a compatriot (12.5 percent) and a high level of miscoordination on the outcomes ((8,1) (1,8)) which is even somewhat higher than in treatment C (64.7 percent in NS compared to 40.7 percent in C; $p = 0.101$, Fisher's exact test, two-sided).

I also do not find that subjects behave more pro-socially towards their compatriots if nationality is non-salient in the dictator and ultimatum game. In the dictator game, subjects give 3.35 tokens to compatriots (treatment C = 3.32). In the ultimatum game, subjects offer 4.28 tokens to compatriots in treatment NS (treatment C = 4.62) and the

minimal acceptable offer is 2.35 when matched with a compatriot in NS (treatment C = 3.13, $p = 0.185$, Mann-Whitney).

Finding 2: *Nationality does not serve as a coordination device if nationality is non-salient. Subjects do not try to coordinate on the payoff-dominant equilibrium with someone from the same nationality if they are provided with additional information about their partner.*

Conjecture 3: Coordination is more difficult if subjects know that their partner has a different nationality.

40.6 percent (39 out of 96) of the participants choose B if they play with someone from a different nationality in treatment S. 42.6 percent (29 out of 68) of the subjects choose B if they play with someone from a different nationality in NS. These percentages are not different from the percentage in treatment C (42.6 percent, χ^2 , $p > 0.776$). The non-significant impact of getting to know that the partner has a different nationality is also confirmed in Models 3 (for treatment S) and 4 (for treatment NS) of Table 27 ($p > 0.453$).

Table 25: Choice to try to coordinate on payoff-dominant equilibrium in coordination game depending matching & co-variates (Probit regression)

Model	(1)	(2)	(3)	(4)
Observations in Treatments	C & S if paired w/ compatriot	C & NS if paired w/ compatriot	C & S if paired w/ non-compatriot	C & NS if paired w/ non-compatriot
Compatriot?	0.055 ** (0.025)	0.001 (0.987)		
Non-compatriot?			0.025 (0.448)	-0.012 (0.912)
Identity	0.207 * (0.062)	0.074 (0.556)	0.231 ** (0.012)	0.061 (0.588)
Female?	0.090 (0.434)	0.097 (0.459)	0.029 (0.770)	0.149 (0.213)
GPA	0.276 *** (0.000)	0.121 (0.216)	0.091 (0.199)	0.088 (0.345)
Subject is Korean?	-0.227 (0.126)	-0.130 (0.394)	-0.153 (0.224)	-0.190 (0.157)
Subject is Chinese?	-0.233 (0.102)	-0.085 (0.563)	-0.171 (0.163)	-0.060 (0.655)
N	154	142	200	176

Notes: Coefficients are average marginal effects. P-values in parentheses. *p<0.1, **p<0.05, ***p<0.01. Robust standard errors clustered on subject level. Compatriot = 1 if subject is paired with compatriot, 0 otherwise. Non-compatriot = 1 if subject is paired with subject having a different nationality, 0 otherwise. Subject is Korean/Chinese? 1 if yes, 0 otherwise. Female = 2 if subject is a female, 1 otherwise.

In Figure 5 I can see that only a low fraction of outcomes are payoff-dominant (12.5 percent) when matched with someone from a different nationality in S. Moreover, 56.3 percent miscoordinate on the outcomes ((8,1) (1,8)) in S when matched with someone from a different nationality which is insignificantly higher than in C (Fisher's exact test, p = 0.164, two-sided). Also in treatment NS, few outcomes are payoff-dominant when matched with someone from a different nationality (14.7 percent) – but this percentage is still higher than when matched with someone from the same nationality in NS (11.8 percent). 55.9 percent miscoordinate on the outcomes (8,1) and (1,8) which is somewhat

higher than in the control treatment (40.7 percent, $p = 0.192$, two-sided, Fisher's exact test) but less than when matched with someone from the same nationality in S (64.7 percent).

Finding 3: *Subjects do not try to coordinate on the payoff-dominant equilibrium less if they know that their partner has a different nationality regardless whether nationality is salient or non-salient.*

Figure 5 illustrates an additional finding: Miscoordination, i.e. the outcomes (1,8) and (8,1) are considerably less likely in the control treatment (40.7 percent) as compared to the treatments S and NS regardless whether subjects in these two treatments are matched with someone from their own or another nationality (miscoordination ranges in these cases from 54.2 to 64.7 percent). The difference between the C and the S treatment is significant at $p = 0.100$ ($\text{Chi}^2 = 2.710$); i.e. already providing participants with information about their partners' nationality seems to be sufficient to increase the risk of miscoordination. Part of this difference is likely explainable from the fact that the subjects try harder to coordinate on the payoff-dominant equilibrium in S when matched with a compatriot.

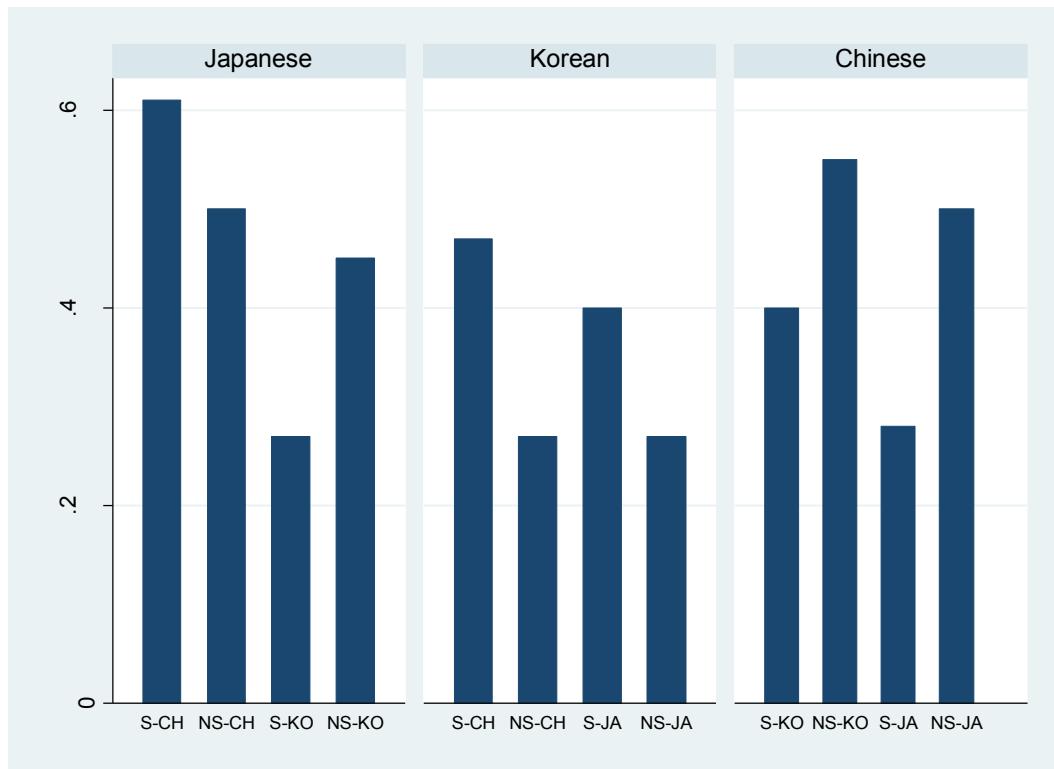
The difference between the C and NS treatment is also marginally significant ($p = 0.064$, $\text{Chi}^2 = 3.431$); i.e. providing subjects with information about their partners' nationality, university status, hair color, eye color, and age increases the risk of miscoordination to an even larger extent. The difference between the control and the S and NS treatments combined is significant at $p = 0.047$ ($\text{Chi}^2 = 3.931$). As the probabilities of choosing B are similar in treatments C and NS (and S if matched with

someone from a different nationality), this difference cannot be explained by a *general* tendency of subjects trying harder to coordinate on the payoff-dominant equilibrium in one of the two treatments. One possibility could be that additional information about partners makes some subjects more and others less willing to try to coordinate on the payoff-dominant equilibrium.

Finding 4: *The probability of miscoordination is higher if subjects have salient and/or non-salient information about their partners' nationality.*

I conclude my analysis by investigating the role of the constellations of nationalities. Figure 6 provides an overview of the probability of choosing B depending on the treatment and the constellation of nationalities. The figure shows some interesting, nationality specific patterns. First, I observe that Japanese subjects, who seemed, according to Figure 4, not to discriminate between compatriots and other nationals, discriminate between Koreans (only 27 percent choose B when paired with a Korean in treatment S) and Chinese (61 percent). Korean subjects tend to be less likely to choose B when the information about their partner's nationality is non-salient as compared to when it is salient. The opposite is true for Chinese, who tend to be less likely to choose B when the information about their partner's nationality is salient. For example, when a Chinese only knows about his partner that she is Japanese (treatment S) she chooses B with a probability of 0.28 as compared to a probability of 0.5 when additional information about the partner is available besides her Japanese nationality (treatment NS).

Figure 6: Choice to try to coordinate on payoff-dominant equilibrium depending on treatment and constellations of nationalities



Notes: S-CH: Treatment S, subject is paired with Chinese; NS-CH: Treatment NS, subject is paired with Chinese, S-KO: Treatment S, subject is paired with Korean; NS-KO: Treatment NS, subject is paired with Korean, S-JA: Treatment S, subject is paired with Japanese; NS-JA: Treatment NS, subject is paired with Japanese.

Notably, in S and NS combined, subjects are quite unlikely to choose B if their partner is Japanese and not a compatriot (35.7 percent). This percentage is lower than when the partner is Korean (40.4 percent) or Chinese (48.2 percent). While these differences are not uniform and not statistically significant, the patterns are consistent with a history of national disagreements in the region. Namely, one may speculate that both the Chinese and Korean subjects are biased against the Japanese in response to the Japanese imperialist policy and military occupations of their nations in the past.

6. Conclusion

In this chapter, I experimentally test the relevance and scope of focal points when individuals make decisions under strategic uncertainty. In a period that is marked by extensive international trade, nationality may present one important focal point that individuals can coordinate on. What is the relevance and scope of nationality as a coordination device? I recruited subjects coming from three countries that heavily engage in international trade and let them play coordination games in three treatments in which I manipulated the information they receive about their partner.²⁷

My findings suggest that nationality can function as a coordination device but that the scope of this device is limited. Subjects attempt to coordinate more on the payoff-dominant equilibrium if their partner has the same nationality and the information about the partners' nationality is salient. I provide suggestive evidence showing that this difference is not the result of more pro-social behavior towards compatriots, i.e., in-group favoritism. However, if the information about the partners' nationality is not salient, i.e., nationality is only one of several other attributes which subjects know about their partner, nationality seems to be irrelevant for coordination. Moreover, overall I do not find that coordination is more difficult between partners of different nationalities.

One possible explanation of these results may lie in the dual nature of culture in this experiment. Nationality certainly constitutes an important part of one's culture and identity, but it does not represent the full extent of it. While being nationals of three different countries, the subjects in this experiment are all students of University of Hawaii. They are united by a common university culture and international community.

²⁷ According to the size of their exports China ranks 2nd, Japan 4th, and Korea 12th. From 2000-2008 China has almost six-folded, Japan and Korea have more than doubled, their exports. Data from United Nations Statistics Department available at <http://unstats.un.org/unsd/trade/imts/annual%20totals.htm>.

As the focus is diluted away from nationality in the non-salient treatment, common culture for university students may dominate and hence the results on nationalities are weakened. The dual nature of culture in my experiment may also explain why I do not find significant in-group favoritism in the dictator and ultimatum games.²⁸

More generally, one may speculate that the scope of nationality as a coordination device is limited because (i) interacting parties often have access to more information about their partners than only their nationality and (ii) there is a probability that they share different cultural aspects. On the other hand, my findings also suggest that having more information about trading partners may not necessarily be beneficial as it seems to increase the risk of miscoordination. Moreover, my experimental results imply that coordination is not more difficult between parties from different nationalities if subjects have more information about their partners than only their nationality.

These results also contribute to the growing cross-cultural literature and the economic literature on group identity. My findings suggest the necessity of conducting experiments that manipulate the salience of cultural and group membership for testing the robustness of the findings in the in- and out-group literature, which use natural groups.

²⁸ Relatedly, Buchan et al (2009) find that globalization promotes cooperation.

Concluding Remarks and Policy Implications

The first two chapters of this dissertation examine the evolution of foreign direct investment inflows to developing countries around financial crises. In the first chapter, I empirically examine the Fire-Sale FDI hypothesis and describe the pattern of FDI inflows surrounding financial crises. I add a more granular detail about the types of crises and their potentially differential effects on FDI. Moreover, I distinguish between Mergers and Acquisitions (M&A) and Greenfield investment, as well as between different motivations for FDI—horizontal and vertical.

The results indicate that financial crises have a strong negative effect on inward FDI in developing countries. Crises are also shown to reduce the value of horizontal and vertical FDI. I do not find empirical evidence of Fire-Sale FDI. On the contrary, financial crises are shown to affect FDI flows and M&A activity negatively. I observe that the effects of different types of crises on various forms of FDI vary in terms of their duration and persistence. The most persistent type of crisis appears to be hyperinflation crisis, with its average impact on both vertical and horizontal FDI lasting for over five years. The effects of the external debt crisis on FDI stocks also remain significant well into the fifth year following a crisis, albeit slightly diminishing each year. Similar trend is observed with banking crises and inflation crises, both of which significantly reduce all forms of investment for two years following the onset of a crisis. The negative impact of the external debt crises on vertical FDI and M&A, on the contrary, is larger in the year after the crisis relative to the year the crisis emerges.

While these results may seem expected, they do not fit the pattern described by Krugman's Fire-sale FDI analysis of the Asian crisis. There may be at least two possible

explanations for this difference. First, Asia was unique and the reasons for the Asian crisis different from other cases of financial crises. While Krugman focused on the Asian financial crises, my sample is broader both in its coverage of countries and years. I find no evidence of fire-sale FDI following an *average* financial crisis in developing countries. Secondly, as is the case with any macroeconomic data, there are questions about the quality of FDI data (particularly, M&A data) and it may be that the data are simply not good enough to identify this fire-sale pattern.

It is important to note that Krugman's impetus was also normative. He asks: "does the foreign purchase of Asian assets represent the transfer of control to efficient owners who were previously unable to buy at a reasonable price? Or does it represent sales to inefficient owners who happen to have cash?" He further inquires: "Does the fire sale of domestic firms and their assets represent a burden to the afflicted countries, over and above the cost of the crisis itself?" (Krugman, 2000, p. 44)

My results do not suggest any normative conclusions and are solely descriptive. I introduce no normative claims, and therefore also do not believe my work necessarily implies any prescriptive conclusions. It may well be that while on net there is no fire-sale associated with large financial crises, some FDI transactions do involve fire-sale-characteristics and may even be morally questionable (as Krugman appears to suggest). In particular, it may be the case that some of the transactions that occur after a domestic financial collapse do transfer ownership to inefficient foreign owners ("who happen to have cash") and that this imposes additional long-term burden on the afflicted countries. None of what I find suggests that this categorically does not happen; examining net FDI flows, however, does not provide evidence of any such adverse impacts.

Moreover, my claim that FDI inflows also decline in the aftermath of financial crises, like other types of capital flows, does not necessarily contradict the consensus that FDI is preferable to ‘hot money’ during times of financial turmoil. The FDI reversals that I record are still probably much smaller than the reversals associated with other types of financial flows (especially short-term debt).

The topic of financial crises and FDI is an important and timely one today given recent global financial turmoil. The findings of the paper are relevant not only because they evaluate the effects of crises on FDI, but because they inform us about the types of crises that these countries are experiencing (or are at least perceived to be experiencing). Just as Krugman concluded, observing or not observing fire-sale FDI lends support to either the fundamental explanation or the panic view behind the cause of the crisis. With regards to FDI, the findings are relevant as FDI is becoming increasingly important as a form of capital flows, and changes in the valuation of FDI projects also leads to significant international transfers of wealth.

My results find support in the FDI reversal that is apparent in the immediate aftermath of the 2008-2010 global financial crisis, by far the most global recession since the great depression (Bordo and Landon-Lane, 2010). While the long-run effects of this crisis still remain to be seen, the current downturn has been accompanied by a precipitous decline in FDI flows worldwide of 40% between the peak in 2007 and the trough in 2009 (UNCTAD, 2011). The recent crisis, of course, was global, so credit contracted everywhere; that is not the usual turn of events surrounding a financial crisis that is limited to a specific country and/or region. Yet, even in these cases, I observed large declines in FDI inflows of (almost) all types.

In the second chapter, I focus my analysis of FDI on the members of the Association of South East Asian Nations (ASEAN). I analyze historical data on ASEAN inward FDI in the context of the Asian financial crisis (AFC) and the 2008 economic downturn and present new data on ASEAN FDI cycles following the 1997 crisis relative to historical crises incidences. Empirically examining the effects of the AFC on ASEAN, I compare them to the historical averages for the Asian region as well a broad sample of forty developing countries. Distinguishing between the different types of crises and FDI, I find that AFC had a negative and relatively large effect on ASEAN FDI, as compared with historical averages.

The Association of Southeast Asian Nations has become one of the most important organizations in the region. It boasts rapid growth, openness and rapid integration into the world economy as an important trade partner in Asia. Most importantly, however, is ASEAN's role as a vital host for foreign direct investment. The attraction of FDI inflows has become one of the explicit goals of the ASEAN Economic Community (AEC). As noted by Plummer and Cheong (2007), "the diversity of economic structure in the ASEAN region makes it a particularly strong candidate for investment cooperation." However, problems still remain. Among the most widespread are corruption, insufficiently educated labor force, and inefficient government bureaucracy. Moreover, the growth in ASEAN FDI could have been even more remarkable had it not been for two important economic downturns – the Asian crisis of 1997 and the 2007 global economic recession.

Despite important differences, both the Asian Financial Crisis and the recent global downturn have had similar destabilizing effects on the ASEAN economies and on

FDI inflows. We see that ASEAN crisis-struck countries were each affected in their own way and took significantly different amounts of time to recover from the Asian crisis of 1997.

In the decade since the Asian crisis, we have witnessed a strong economic renewal in the region. ASEAN has reemerged as one of the most dynamic regions in the world. It appears that the 1997 crisis was a trigger that brought ASEAN regionalism to a new level. Policy makers realized that by joining together they can turn the crisis into opportunity. They spent the following decade strengthening intra-regional cooperation through initiatives like AFTA, AIA, and ACIA. One area of future research is to examine whether ASEAN regional integration has outpaced global integration in the decade following the Asian crisis. Moreover, the effects of ASEAN regional integration on FDI inflows into the region still remain to be quantified.

Finally, in the third chapter, I experimentally test the relevance and scope of focal points when individuals make decisions under strategic uncertainty. In a period that is marked by extensive international trade, nationality may present one important focal point that individuals can coordinate on. What is the relevance and scope of nationality as a coordination device? I recruited subjects coming from three countries that heavily engage in international trade and let them play coordination games in three treatments in which I manipulated the information they receive about their partner.²⁹

My findings suggest that nationality can function as a coordination device but that the scope of this device is limited. Subjects attempt to coordinate more on the payoff-dominant equilibrium if their partner has the same nationality and the information about

²⁹ According to the size of their exports China ranks 2nd, Japan 4th, and Korea 12th. From 2000-2008 China has almost six-folded, Japan and Korea have more than doubled, their exports. Data from United Nations Statistics Department available at <http://unstats.un.org/unsd/trade/imts/annual%20totals.htm>.

the partners' nationality is salient. I provide suggestive evidence showing that this difference is not the result of more pro-social behavior towards compatriots, i.e., in-group favoritism. However, if the information about the partners' nationality is not salient, i.e., nationality is only one of several other attributes which subjects know about their partner, nationality seems to be irrelevant for coordination. Moreover, overall I do not find that coordination is more difficult between partners of different nationalities.

One possible explanation of these results may lie in the dual nature of culture in this experiment. Nationality certainly constitutes an important part of one's culture and identity, but it does not represent the full extent of it. While being nationals of three different countries, the subjects in this experiment are all students of University of Hawaii. They are united by a common university culture and international community. As the focus is diluted away from nationality in the non-salient treatment, common culture for university students may dominate and hence the results on nationalities are weakened. The dual nature of culture in my experiment may also explain why I do not find significant in-group favoritism in the dictator and ultimatum games.³⁰

More generally, one may speculate that the scope of nationality as a coordination device is limited because (i) interacting parties often have access to more information about their partners than only their nationality and (ii) there is a probability that they share different cultural aspects. On the other hand, my findings also suggest that having more information about trading partners may not necessarily be beneficial as it seems to increase the risk of miscoordination. Moreover, my experimental results imply that coordination is not more difficult between parties from different nationalities if subjects have more information about their partners than only their nationality.

³⁰ Relatedly, Buchan et al (2009) find that globalization promotes cooperation.

My findings suggest the necessity of conducting experiments that manipulate the salience of cultural and group membership for testing the robustness of the findings in the in- and out-group literature, which use natural groups.

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Appendix A: List of developing and emerging economies by region

South and East Asia (9)

China, India, Indonesia, Malaysia, Myanmar, Philippines, South Korea, Sri Lanka, Thailand

Middle East & North Africa (4)

Algeria*, Egypt, Morocco, Tunisia

Sub-Saharan Africa (10)

Angola*, Central African Republic, Côte d'Ivoire, Ghana, Kenya, Mauritius, Nigeria*, South Africa, Zambia, Zimbabwe

Latin America (18)

Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador*, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru, Uruguay, Venezuela*

East Europe and Central Asia (4)

Poland, Romania, Russian Federation, Turkey

* OPEC member countries are excluded from the sample in our regressions.

Appendix B: Typology of Crises

Name	Definition	Data Source
Inflation crisis	An annual inflation rate of 20% or higher.	R&R
Hyperinflation crisis	An annual inflation rate of 500% or higher	R&R Chartbook
Currency crash	An annual depreciation versus the US dollar of 15% or more	R&R
Banking crisis	Defined by the following events: if there are no bank runs, the closure, merging, takeover, or large-scale government assistance of important financial institution that marks the start of a string of similar outcomes for other financial institutions	R&R (Kaprio & Klingebiel, Kaminsky & Reinhart, Jacome)
Systemic/severe Banking crisis	Defined by the following events: Bank runs that lead to the closure, merging, or takeover by the public sector of one or more financial institutions	R&R (Kaprio & Klingebiel, Kaminsky & Reinhart, Jacome)
External Debt crisis	The failure of government to meet a principal or interest payment on the due date (or within the specified grace period). These episodes include instances in which rescheduled debt is ultimately extinguished in terms less favorable than the original obligation	R&R
Domestic Debt crisis	The above definition for external debt crisis applies. In addition, domestic debt crises have involved the freezing of bank deposits and/or forcible conversions of such deposits from dollars to local currency	R&R
Stock market crash	A sudden decline of stock prices resulting in a significant loss of paper wealth	R&R
Banking crisis starting year	The first year of the start of the systemic banking crisis (defined by the above events)	R&R Chartbook
External crisis starting year	The first year of the start of the external debt crisis	R&R Chartbook
Domestic crisis starting year	The first year of the start of the external debt crisis	R&R Chartbook

Appendix C: Data sources

Variable	Definition	Source
Dependent variables		
FDI flows	Net FDI inflow (current \$US)	UNCTAD
FDI stocks	FDI Stock (current \$US)	UNCTAD
M&A	M&A value (current \$US)	UNCTAD
Greenfield FDI	Constructed value of greenfield investment = Total inflow – M&A (current \$US)	Authors calculations, UNCTAD
Vertical FDI	Constructed value of vertical FDI = MNC sales in the U.S. + MNC sales to other countries (current \$US)	BEA
Horizontal FDI	Constructed value of horizontal FDI = MNC local sales (current \$US)	BEA
Control variables		
GDP per capita	GDP per capita (current \$US)	WDI
GDP growth	GDP growth (annual %)	WDI
Inflation	Inflation, consumer prices (annual %)	WDI
Exports	Exports of goods and services (current \$US)	WDI
Gross fixed capital formation	Gross fixed capital formation (current \$US)	WDI
Urban population	Urban population (% total)	WDI
Telephone lines	Telephone lines (per 100 people)	WDI
Mobile cellular subscriptions	Mobile cellular subscriptions (per 100 people)	WDI
Trade tax Duties	Taxes on international trade (% of revenue) Customs and other import duties (% of tax revenue)	WDI WDI
Real GDP per capita	Real GDP per capita (constant price: Chain series)	Penn World Tables
Real GDP	Real GDP (population x real GDP per capita, Chain series)	Penn World Tables
Trade openness	Country openness (constant prices, in %)	Penn World Tables
Population	Population (in thousands)	Penn World Tables
Education	Average education years	Barro and Lee
Squared education difference	Squared difference in average education years between the host country and USA	Authors calculations, Barro and Lee
Real per capita capital	Real capital per capita (with varying depreciation rate = 0,5, 10, 15%)	Jian Li, et al. (2011)
Political and business environment		

Political rights	Political rights index	Freedom House
Civil liberties	Civil liberties index	Freedom House
Political risk	Political risk rating	ICRG-PRS
Quality of institutions	Quality of institution index	ICRG-PRS
Government stability	Government stability index	ICRG-PRS
Socioeconomic conditions	Socio-economic conditions index	ICRG-PRS
Investment climate	Investment climate index	ICRG-PRS
Corruption	Corruption index	ICRG-PRS
Distance and other geographical, economic, and cultural variables		
Land area	Land area (sq. km)	WDI
Contiguous	Dummy variable indicating HOST country and USA are geographically contiguous	CEPII Gravity data set
Weighted distance	Population-weighted distance between the HOST and USA	CEPII Gravity data set
Common official language	Dummy variable indicating Host country and USA share a common official language	CEPII Gravity data set
Common ethnic language	Dummy variable indicating that Host country and USA share a language which at least 9% of population speak in each country	CEPII Gravity data set
Regional trade agreement (RTA)	Dummy variable indicating RTA between Host country and USA	WTO
WTO member	Dummy variable indicating that Host country is a member of WTO	CEPII Gravity data set

Appendix D: Pre-experimental Questionnaire

1. What is your age?

2. Please indicate your gender

Male Female

3. What is your major at UH?

4. How long have you lived in the United States?

5. Of which country are you currently a citizen?

6. How strongly do you identify yourself with this country?

Not at all Somewhat Very strongly

7. Are you happy to identify yourself with this country?

No Somewhat Yes

Appendix E : Experimental Instructions

Treatment C (Control)

Welcome and thank you for your participation in the economics experiment on decision making!

Introduction

Please note that you are not allowed to communicate with each other during the experiment.

During this experiment you will participate in decision tasks that give you the opportunity to earn money. All the earnings in this experiment will be in dollars. Immediately upon completion of the experiment we will pay you your game earnings in CASH. Your earnings are confidential and you will be paid in private.

This experiment will consist of several parts. In each part, you will be asked to make 3 decisions which will involve another participant with whom you will be randomly matched. For every decision task, you will be randomly matched with a **different** participant than in the previous decision. Your decision may affect the payoffs of others, just as the decisions of the person you are matched with may affect your payoffs.

At the end of the experiment, the computer will randomly choose one task from each part as the paid task. The other tasks will remain unpaid. You will not be informed of the results of any task until the end of the experiment.

We will proceed to the decisions once the instructions are clear. Are there any questions?

Part 1

In this part, you will be randomly matched with one other participant. Their identity will not be revealed to you and yours will not be revealed to them.

You will be assigned a role: Proposer or Responder. Your role will remain the same for all three decisions in this part and in the next.

Instructions to the PROPOSERS: A sum of **10** dollars has been allocated to the both of you. The proposer gets to choose how the money should be divided between you. The

proposer's task is to choose an amount between 0 and 10 dollars to be offered to the responder.

Instructions to the RESPONDERS: The responders will not see the proposer's offer. The responder's task is to indicate the smallest amount which they will accept from the proposer. If the proposer's actual offer to the responder is at least as large as the smallest offer responder is willing to accept, then the money is divided according to the proposer's offer. Otherwise, neither of you will receive anything.

Your decisions during this experiment will remain anonymous and private and you will not know the outcome of the decisions until the end of the experiment. You will be asked to make 3 decisions in this part, and each time you will be matched with a **different** person.

Any questions?

Part 2

In this part, you will be matched with different participants than before. You have not been matched with these people before. You have been assigned the same role as in the previous part (proposer or responder). The proposer has to make a decision, while the responder has no decision to make in this game. As before, you will not know the identity of the person you are matched with.

Instructions to the Proposers: A sum of **10** dollars has been allocated to the both of you. The proposer gets to choose how the money should be divided between you. The proposer's task is to choose an amount between 0 and 10 dollars to be offered to the

responder. The responder has no decision to make in this game, so the money will be divided according to the decision of the proposer.

You will be asked to make your decision three times, and each time you will be matched with a **different** person.

Please make your decision as prompted on the screen.

Part 3

In this part, you have been randomly matched with another person. You have not been matched with this person before. Both of you will make decisions at the same time and your payoff in this part will depend on your decision as well as the decision of the participant with whom you are matched. Their identity will not be revealed to you.

Your task in this part is to choose either “A” or “B”

Depending on your choice and the choice of your match, your earnings will be the following:

Other participant

A	7, 7	8, 1
You		
B	1, 8	9, 9

- If you choose “A” and the other participant chooses “A” then both of you receive \$7 each
- If you choose “A” and the other participant chooses “B” then you get \$8 and the other participant gets \$1
- If you choose “B” and the other participant chooses “B” then both of you receive \$9 each
- If you choose “B” and the other participant chooses “A” then you get \$1 and the other participant gets \$8.

Now, please make your decision as prompted on the screen

Treatment S (Salient)

Welcome and thank you for your participation in the economics experiment on decision making!

Introduction

Please note that you are not allowed to communicate with each other during the experiment.

During this experiment you will participate in decision tasks that give you the opportunity to earn money. All the earnings in this experiment will be in dollars. Immediately upon completion of the experiment we will pay you your game earnings in CASH. Your earnings are confidential and you will be paid in private.

This experiment will consist of several parts. In each part, you will be asked to make 3 decisions which will involve another participant with whom you will be randomly matched. For every decision task, you will be randomly matched with a **different** participant than in the previous decision. Your decision may affect the payoffs of others, just as the decisions of the person you are matched with may affect your payoffs.

At the end of the experiment, the computer will randomly choose one task from each part as the paid task. The other tasks will remain unpaid. You will not be informed of the results of any task until the end of the experiment.

We will proceed to the decisions once the instructions are clear. Are there any questions?

Part 1

In this part, you will be randomly matched with one other participant. Their identity will not be revealed to you and yours will not be revealed to them. All you will know about them is their nationality.

You will be assigned a role: Proposer or Responder. Your role will remain the same for all three decisions in this part and in the next.

Instructions to the PROPOSERS: A sum of **10** dollars has been allocated to the both of you. The proposer gets to choose how the money should be divided between you. The

proposer's task is to choose an amount between 0 and 10 dollars to be offered to the responder.

Instructions to the RESPONDERS: The responders will not see the proposer's offer. The responder's task is to indicate the smallest amount which they will accept from the proposer. If the proposer's actual offer to the responder is at least as large as the smallest offer responder is willing to accept, then the money is divided according to the proposer's offer. Otherwise, neither of you will receive anything.

Your decisions during this experiment will remain anonymous and private and you will not know the outcome of the decisions until the end of the experiment. You will be asked to make 3 decisions in this part, and each time you will be matched with a **different** person.

Any questions?

Part 2

In this part, you will be matched with different participants than before. You have not been matched with these people before. You have been assigned the same role as in the previous part (proposer or responder). The proposer has to make a decision, while the responder has no decision to make in this game. As before, you will not know the identity of the person you are matched with, except their nationality

Instructions to the Proposers: A sum of **10** dollars has been allocated to the both of you. The proposer gets to choose how the money should be divided between you. The proposer's task is to choose an amount between 0 and 10 dollars to be offered to the

responder. The responder has no decision to make in this game, so the money will be divided according to the decision of the proposer.

You will be asked to make your decision three times, and each time you will be matched with a **different** person.

Please make your decision as prompted on the screen.

Part 3

In this part, you have been randomly matched with another person. You have not been matched with this person before. Both of you will make decisions at the same time and your payoff in this part will depend on your decision as well as the decision of the participant with whom you are matched. Their identity will not be revealed to you, except their nationality..

Your task in this part is to choose either “A” or “B”

Depending on your choice and the choice of your match, your earnings will be the following:

Other participant

	A	B
A	7, 7	8, 1
You		
B	1, 8	9, 9

- If you choose “A” and the other participant chooses “A” then both of you receive \$7 each
- If you choose “A” and the other participant chooses “B” then you get \$8 and the other participant gets \$1
- If you choose “B” and the other participant chooses “B” then both of you receive \$9 each
- If you choose “B” and the other participant chooses “A” then you get \$1 and the other participant gets \$8.

Now, please make your decision as prompted on the screen

Treatment NS (Non-salient)

Welcome and thank you for your participation in the economics experiment on decision making!

Introduction

Please note that you are not allowed to communicate with each other during the experiment.

During this experiment you will participate in decision tasks that give you the opportunity to earn money. All the earnings in this experiment will be in dollars. Immediately upon completion of the experiment we will pay you your game earnings in CASH. Your earnings are confidential and you will be paid in private.

This experiment will consist of several parts. In each part, you will be asked to make 3 decisions which will involve another participant with whom you will be randomly matched. For every decision task, you will be randomly matched with a **different** participant than in the previous decision. Your decision may affect the payoffs of others, just as the decisions of the person you are matched with may affect your payoffs.

At the end of the experiment, the computer will randomly choose one task from each part as the paid task. The other tasks will remain unpaid. You will not be informed of the results of any task until the end of the experiment.

We will proceed to the decisions once the instructions are clear. Are there any questions?

Part 1

In this part, you will be randomly matched with one other participant. Their identity will not be revealed to you and yours will not be revealed to them. All you will know about them is:

Age, Status at UH, Eye color, Hair Color, and Nationality.

You will be assigned a role: Proposer or Responder. Your role will remain the same for all three decisions in this part and in the next.

Instructions to the PROPOSERS: A sum of **10** dollars has been allocated to the both of you. The proposer gets to choose how the money should be divided between you. The proposer's task is to choose an amount between 0 and 10 dollars to be offered to the responder.

Instructions to the RESPONDERS: The responders will not see the proposer's offer. The responder's task is to indicate the smallest amount which they will accept from the proposer. If the proposer's actual offer to the responder is at least as large as the smallest offer responder is willing to accept, then the money is divided according to the proposer's offer. Otherwise, neither of you will receive anything.

Your decisions during this experiment will remain anonymous and private and you will not know the outcome of the decisions until the end of the experiment. You will be asked to make 3 decisions in this part, and each time you will be matched with a **different** person.

Any questions?

Part 2

In this part, you will be matched with different participants than before. You have not been matched with these people before. You have been assigned the same role as in the previous part (proposer or responder). The proposer has to make a decision, while the responder has no decision to make in this game. As before, you will not know the identity of the person you are matched with, except their:

Age, Status at UH, Eye Color, Hair Color, and Nationality.

Instructions to the Proposers: A sum of **10** dollars has been allocated to the both of you. The proposer gets to choose how the money should be divided between you. The proposer's task is to choose an amount between 0 and 10 dollars to be offered to the responder. The responder has no decision to make in this game, so the money will be divided according to the decision of the proposer.

You will be asked to make your decision three times, and each time you will be matched with a **different** person.

Please make your decision as prompted on the screen.

Part 3

In this part, you have been randomly matched with another person. You have not been matched with this person before. Both of you will make decisions at the same time and your payoff in this part will depend on your decision as well as the decision of the participant with whom you are matched. As before, you will not know the identity of the person you are matched with, except their:

Age, Status at UH, Eye Color, Hair Color, and Nationality.

Your task in this part is to choose either “A” or “B”

Depending on your choice and the choice of your match, your earnings will be the following:

Other participant

		A	B
		7, 7	8, 1
A		8, 1	9, 9
You	A	7, 7	8, 1
	B	1, 8	9, 9

- If you choose “A” and the other participant chooses “A” then both of you receive \$7 each
- If you choose “A” and the other participant chooses “B” then you get \$8 and the other participant gets \$1
- If you choose “B” and the other participant chooses “B” then both of you receive \$9 each
- If you choose “B” and the other participant chooses “A” then you get \$1 and the other participant gets \$8.

Now, please make your decision as prompted on the screen

Appendix E: Exit Questionnaire

1. What is your gender? M F

2. What is your major at UH? _____

3. What is your GPA? _____

4. How long have you been living in the United States? _____

5. How easy to understand were the instructions? _____

6. [Only applicable to NS treatments] When making decisions in this experiments, you were matched with another person. Which of their characteristics were most important in your decision? _____

7. Do you have any friends participating in this session at the same time with you?
____ Yes ____ No

8. If you do have friends in this session with you, did that affect your decisions in this experiment? ____ Yes ____ No

9. Did you like the experiment? ____ Yes ____ No

10. Please add any additional comments you have about this experiment:

Appendix F: Consent Form

AGREEMENT TO PARTICIPATE IN EXPERIMENTAL MARKETS

Principal investigator: **Olga Bogach**, Department of Economics,
University of Hawaii, phone (808)-956-2325

This is a research experiment in economics of decision-making. The experiment has been explained to me in detail, and I have been familiarized with experimental instructions. I understand that the experiment is voluntary, and participation is anonymous. The data collected on my decisions will be anonymous and will not put me at any risk. Although there are no risks to me, I will be paid \$5 participation fee, plus whatever money I make during the experiment. There are benefits to the society from this experiment in studying economics of decision making.

I certify that I have been told of the possible risks involved in this project that I have been given satisfactory answers to my inquiries concerning project procedures and other matters and that I have been advised that I am free to withdraw my consent and to discontinue participation in the project at any time without prejudice. I understand that the experiment will take at most 1 hour.

I herewith give my consent to participate in this project with the understanding that such project does not waive any of my legal rights; nor does it release the principal investigator or the institution or any employee or agent thereof from liability for negligence.

Signature of participant: _____

Date: _____

If you cannot obtain satisfactory answers to your questions from the Principal Investigator, or have comments or complaints about your treatment in this study, contact: Committee on Human Studies, University of Hawaii, 2540 Maile Way, Honolulu, HI 96822. Phone: (808)-956-5007

Appendix G: Ultimatum and Dictator Game Results

Table A1: Ultimatum and Dictator Game Behavior: Constellation of Nationalities in NS Treatment

Variable (mean, \$)	ja-ja	ja-ko	ja-ch	ko-ko	ko-ja	ko-ch	ch-ch	ch-ja	ch-ko
Proposer's share in ultimatum game	5.4 <i>7</i>	5.5 <i>6</i>	5.6 <i>5</i>	5.6 <i>5</i>	4.5 <i>4</i>	6.2 <i>5</i>	6.2 <i>6</i>	5.7 <i>6</i>	6.0 <i>6</i>
Proposer's share in dictator game	6.0 <i>6</i>	6.0 <i>6</i>	5.8 <i>6</i>	6.6 <i>5</i>	6.8 <i>5</i>	5.6 <i>5</i>	7.3 <i>6</i>	6.5 <i>6</i>	7.3 <i>6</i>
Responder's minimum acceptable offer	1.8 <i>6</i>	1.8 <i>4</i>	2.7 <i>6</i>	2.8 <i>5</i>	4.2 <i>6</i>	3.3 <i>6</i>	2.5 <i>6</i>	3.0 <i>6</i>	2.6 <i>5</i>

Notes: ja = Japanese, ch = Chinese, ko = Korean. Numbers in italics show the respective number of observations. Ja-ko, for example, shows the mean decision of the Japanese proposers matched with Korean responders, whereas ko-ja shows the mean decision of the Korean proposer matched with a Japanese responder.

Table A2: Ultimatum and Dictator Game Behavior: Constellation of Nationalities in S Treatment

Variable (mean, \$)	ja-ja	ja-ko	ja-ch	ko-ko	ko-ja	ko-ch	ch-ch	ch-ja	ch-ko
Proposer's share in ultimatum game	5.0 <i>9</i>	4.8 <i>6</i>	4.9 <i>8</i>	4.7 <i>6</i>	5.3 <i>9</i>	5.4 <i>8</i>	4.6 <i>9</i>	5.2 <i>10</i>	3.7 <i>7</i>
Proposer's share in dictator game	6.2 <i>10</i>	5.8 <i>6</i>	6.3 <i>8</i>	6.8 <i>6</i>	7.9 <i>8</i>	7.4 <i>8</i>	7.1 <i>9</i>	7.6 <i>10</i>	7.6 <i>8</i>
Responder's minimum acceptable offer	3.3 <i>9</i>	3.6 <i>9</i>	3.6 <i>10</i>	3.2 <i>6</i>	3.2 <i>6</i>	1.9 <i>7</i>	3.9 <i>9</i>	3.6 <i>8</i>	3.5 <i>8</i>

Notes: ja = Japanese, ch = Chinese, ko = Korean. Numbers in italics show the respective number of observations. Ja-ko, for example, shows the mean decision of the Japanese proposers matched with Korean responders, whereas ko-ja shows the mean decision of the Korean proposer matched with a Japanese responder.

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