

**Financial Market Development:**

**Does financial liberalization induce regulatory governance reform?**

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## **Abstract**

Economists emphasize the critical need for developing good institutions *prior* to financial liberalization to mitigate the adverse effects of liberalization on financial system stability. While sequencing regulatory governance reform before financial liberalization is a prudent policy prescription, it may be a ponderous task to carry out because regulatory governance reform faces severe obstacles in many countries. This paper explores whether financial liberalization itself induces regulatory governance reform. Using an ordered probit model and data from 17 emerging financial economies between 1973 and 2004, the results show that the probability of regulatory governance reform increases after partial and full financial liberalization. In the case of no financial liberalization, there is significantly higher institutional inertia. On a micro-scale, using a probit model, there is evidence supporting the hypothesis that liberalization of the domestic financial sector spurs banking reforms. The empirical evidence supports the hypothesis that there are very severe political constraints and institutional inertia that may hinder regulatory governance reform prior to financial liberalization. The paper finds that the dynamics between financial liberalization and regulatory governance reform are richer than commonly thought.

## **I. Introduction**

Financial liberalization allows market forces to determine the allocation of capital. Models of perfect markets suggest that domestic financial liberalization and international financial liberalization have welfare and efficiency enhancing effects. Thus, prior to the East Asian financial crisis, economists broadly concurred that financial liberalization is desirable. However, the collapse of the “miracle” economies in Thailand, Indonesia and South Korea during the 1997 East Asian financial crisis motivated policymakers and academic scholars to question the indiscriminate advocacy of financial liberalization. During the 1997 crisis, the liberalized economies in Thailand, Indonesia and South Korea experienced sharp recessions and sudden withdrawals of international capital flows, while both China and India, with protected financial economies, emerged unscathed. The crisis raised somber questions on the benefits of financial liberalization and compelled economists to be more circumspect and modify their stance.

Some now argue that a significant cause of financial crises such as the East Asian crisis is the unprecedented emergence of financial liberalization among many developing countries since the 1980s (Tornell, Westermann, Martinez, 2004). Financial liberalization creates scope for innovation and enhances the mobility of risk, but the increasing complexity of financial instruments and risk transfers have also made it more challenging for market participants, supervisors and policy makers to track the development of risks within the financial system and over time. In addition, capital account liberalization may be welfare-enhancing only when there are no serious imperfections in the information and contracting environment (Eichengreen, 2001). As a consequence, some prominent economists such as Rodrik (1998), Krugman (1999) and Stiglitz (2003) have advocated limits on capital flows to

moderate irrationally exuberant investors and the erratic boom-bust patterns in financial markets. Yet, while economists continue to caution against rash, premature financial liberalization, they maintain that financial liberalization is advantageous for long term economic growth. However, they recommend that countries develop a sound regulatory structure, legal system and social safety net, *prior* to financial liberalization.

While sequencing regulatory governance reform before financial liberalization is a prudent policy prescription, it may be a ponderous task to carry out because regulatory governance reform faces severe obstacles in many countries. Thus, it is worth considering a different perspective. This paper explores whether financial liberalization itself may induce regulatory governance reform and proposes that the sequencing of regulatory governance reform and financial liberalization is the reverse of the above prescription. Using an ordered probit model and data from 17 emerging financial economies between 1973 and 2004, the results show that the probability of regulatory governance reform increases after partial and full financial liberalization. In the case of no financial liberalization, there is significantly higher institutional inertia. On a micro-scale, using a probit model, there is evidence supporting the hypothesis that liberalization of the domestic financial sector spurs banking reforms. Overall, the paper finds that the dynamics between financial liberalization and regulatory governance reform are richer than commonly thought.

Section II is a review of the relevant crisis and growth literature. Section III describes the theoretical perspectives underpinning the empirical work and postulates possible causal mechanisms for financial liberalization to spur institutional reforms. Section IV details the data that are used in the model and compares it to existing alternative measurements, highlighting its strengths and weaknesses. It also includes some preliminary statistical

analysis. Section V explains the model specification for testing whether financial liberalization spurs regulatory governance reforms and reports the findings from the study. Section VI summarizes the findings and explains the policy implications of the study.

## **II. Literature Review**

There are two broad strands in the financial liberalization literature that are pertinent to the research question, namely financial crisis and growth studies.

### *Financial Crisis Literature*

In the financial crisis literature, economists are concerned whether financial liberalization increases financial system instability<sup>1</sup> and the likelihood of crises. The studies find a positive relationship between financial liberalization, financial system instability and crises (Tornell, Westermann, Martinez, 2004; Demirguc-Kunt and Detragiache, 1998). Demirguc-Kunt and Detragiache (1998) estimate the likelihood of a banking crisis, given prior financial liberalization by using a multivariate logit model. They find that the impact of financial liberalization on banking sector fragility is weaker where the institutional environment is strong and propose that financial liberalization should be approached cautiously where there are weak or underdeveloped institutions, even if macroeconomic stabilization has been achieved.

A crisis is more likely to afflict a country with weak institutions. Das and Quintyn (2002) note that in nearly all the financial crises in East Asia, Ecuador, Mexico, Russia, Turkey and Venezuela, political interference in the regulatory and supervisory process, forbearance, deficient regulations and supervision have been mentioned as contributing

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<sup>1</sup> Schinasi (2004) defines financial stability as the financial system's ability to facilitate an efficient allocation of economic resources, both spatially and inter-temporally; to assess, price, allocate and manage financial risks; and to maintain its ability to perform these key functions, even when affected by external shocks or a build-up of imbalances through self-corrective mechanisms.

factors to the depth and size of the systemic crises. Other studies also highlight institutional variables such as inadequate instruments of monetary control, overly generous deposit insurance, inadequacies in the operation of the legal system, overexposure in international financial markets, lack of adequate accounting standards and practices, insufficient financial disclosure, and perverse incentive structures (Evans, Leone, Gill and Hilbers, 2000). To reduce the likelihood of financial crises, scholars emphasize the critical need for institutional development prior to liberalization. Good institutions help to facilitate the functioning of efficient markets and check the perverse behavior of financial intermediaries, henceforth mitigating the adverse effects of financial liberalization on financial system stability.

#### *Growth literature*

Historically, economists have held strikingly different views on the importance of the financial system for economic growth. On one hand, Schumpeter (1934) argues that well-functioning banks spur technological innovation by identifying and funding entrepreneurs with the highest probability of successfully implementing innovative products and production processes. In addition, Robinson (1952) proposes that “where enterprise leads, finance follows” (p. 86), meaning that economic development creates demands for particular types of financial arrangements and the financial system responds to these demands. On the other hand, Lucas (1988) contends that economists have “badly over stressed” the role of the financial sector in economic growth.

However, in recent years, there is a growing consensus that builds upon Levine’s (1997) work which supports the argument that the development of the financial system matters for economic growth. Levine suggests that the emergence of financial markets helps to reduce transactional costs and facilitate risk mitigation and transfer. He adds that there is a

positive link between financial development and economic growth and that the level of financial development is a good predictor of future economic development. Several recent studies have found strong empirical support that there is a positive relationship between financial liberalization and long-run economic growth (Tornell, Westermann, Martinez, 2004; Kaminsky, Schmukler, 2003; Quinn, 1997). Bekaert, Harvey and Lundblad (2001) show that equity market liberalization leads to a one percent increase in annual real economic growth over a five-year period, controlling for policy reforms (including the existence and prosecution of insider trading) and business cycle effects. The authors note that a large secondary school enrollment, a small government sector, and an Anglo-Saxon legal system enhance the liberalization effect. In addition, the conditional convergence effect is larger once financial liberalization is accounted for in the neo-classical growth model.

#### *Institutions matter*

Both strands of literature highlight the significance of institutions. Good institutions are critical to reducing the likelihood of crises and enhancing the growth benefits of financial liberalization. Many of these authors prescribe a sequence of reforming regulatory governance, inter alia, before implementing financial liberalization (Tornell, Westermann, Martinez, 2004; Demirguc-Kunt and Detragiache, 1998). In a study examining the impact of regulatory governance on financial system stability, Das, Quintyn and Chenard (2004) use a multivariate cross-section model to provide empirical evidence that the quality of governance practices adopted by the financial system regulators matters for financial system stability. The model controls for macroeconomic conditions, the structure of the banking system, and the quality of political institutions and public sector governance. The results also indicate

that good public sector governance amplifies the impact of regulatory governance on financial system stability.

No systematic and in-depth analysis has been undertaken to consider the relationship between regulatory governance reform and financial liberalization. None of the papers offer a nuanced examination of the complex dynamics between regulatory governance reform and financial liberalization. My research interest emerges from challenging the implicit assumption in the current literature that treats regulatory governance reform and financial liberalization as two independent variables. My hypothesis is that regulatory governance reform is in itself, spurred by financial liberalization. To address the gap in the existing literature, this paper models the empirical relationship between regulatory governance reform and financial liberalization.

### **III. Theoretical Framework**

Institutions are constraints devised by people that structure human interaction. They are made up of formal constraints (rules, laws, constitutions), informal constraints (norms of behavior, conventions, and self imposed codes of conduct), and their enforcement characteristics. They define the incentive structure of societies and economies (North, 1993). Regulatory governance of the financial economy is a specific kind of non-market institution that is examined in this paper. Regulatory governance reform captures a comprehensive range of major changes instituted in the core areas of the financial market, legal and economic infrastructure. Changes in regulatory governance affect the information available and the expectations of investors in explaining the behavior of financial markets. Examples include the existence and enforcement of insider trading laws and disclosure standards, prudential regulation of financial intermediaries and securities exchanges, adoption of



international accounting standards and codes such as the Basel Core Principles. While economists recognize that regulatory governance affects the development of the financial system, it is scarcely formally included in competitive general equilibrium theory or model building. As a consequence, we do not fully understand the dynamics in the interaction between regulatory governance and the evolution of the financial system. Nevertheless, economics offers helpful theoretical insights to the genesis and development of institutions.

*Is competitive general equilibrium theory “institution-free”?*

In competitive general equilibrium theory, the models analyze the interaction of optimizing agents within a simple framework, without reference to the institutional environment, even though there are implicit assumptions about a set of institutions which enforce property rights. For instance, Chan-Lau and Chen (2001) propose a stylized model of financial intermediation to characterize the circumstances along various paths of economic growth, financial development and liberalization that can trigger a crisis. The model assumes three risk agents in the economy: the borrower, depositor and financial intermediaries. It attempts to prescribe how to avoid financial crises through an efficient sequencing of financial development and liberalization measures. In such models, the market is in itself a social institution, operating under definite rules understood by all the agents.

*The demand for institutions*

However, Arrow (1998) argues that competitive general equilibrium theory is “only apparently institution-free” (p.39) and the failures of the theory serve as a fruitful way to examine the demand for institutions in the real economy. He notes that the real economy is different from the competitive general equilibrium theory in three ways: asymmetry of

information, uncertainty with regards to contingent futures markets<sup>2</sup> and the possibility of gains through coordination in the presence of externalities and increasing returns.

First, competitive general equilibrium theory postulates that agents have perfect information. On the contrary, a dispersion of information is a necessary concomitant of a market system. Agents economize on information because information is costly to obtain. Specialization is a prerequisite to achieve efficiency and specialization creates information differences. Institutions are crucial to shaping the incentives that influence information flow. Second, in contingent futures markets, the actual price hinges on the expectations of uncertain future prices and quantities. Expectations *per se* can be thought of as an element of individual psychology, but institutions also play a major role in guiding and forming expectations. Third, the demand for institutions arises to mitigate market failures in the presence of externalities and increasing returns. Institutions are the “missing markets” that can address the problems raised by the presence of externalities and increasing returns. These three major differences create a demand for the creation of non-market institutions to coordinate expectations and enforce incentives.

#### *Institutional “stickiness”*

While sequencing regulatory governance reform before financial liberalization is a prudent policy choice, the reality of existing incentive structures may make it an unwieldy, if not impossible task. Institutions are “sticky” in the context of complex social interdependence. “New institutions often entail high fixed or start-up costs, and they involve considerable learning effects, coordination effects, and adaptive expectations. Established institutions generate powerful inducements that reinforce their own stability and further

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<sup>2</sup>This refers to a market that delivers goods, such as financial payment contingent on the occurrence of certain events. An example is an insurance policy.

development” (Pierson, 2000, p.255). In this way, institutions affect the evolution of the economy as they lock in a particular equilibrium, providing stability and effectively increasing path dependency<sup>3</sup>.

Prior to financial liberalization, domestic institutions may be captured by incumbent parties with non-competitive market power who hold policy hostage to their demands. Rajan and Zingales (2003) find that among developed countries throughout the twentieth century, industrial incumbents had played a significant role in opposing financial development. Besides industrial incumbents, domestic financial intermediaries may take a protectionist stance that hinders the entry of foreign competition. It is not uncommon for emerging economies to have a protected domestic financial market with an uncompetitive monopoly or oligopoly structure. In addition, there may be a huge share of government debt in bank portfolios with financial repression<sup>4</sup> or governments may be awarding influential or state-owned firms or industries with preferential loans. All these indicate the presence of strong vested interests which are likely to lose out in the event of a reform, creating the potential for institutional “stickiness” in an environment without impetus from external stimuli.

#### *Institutions and efficiency issues*

Institutional “stickiness” needs to be considered in light of efficiency concerns. It has been argued that not only does the market achieve optimal results within any given institutional framework, but it also selects the institutional framework that is most Pareto-efficient (Matthew, 1986, p. 907). Matthew suggests several reasons for why institutional

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<sup>3</sup> Pierson conceptualizes path dependency as a social process grounded in a dynamic of “increasing returns”, which can also be described as self-reinforcing feedback processes. This argument highlights the costs of switching from one alternative to another increase over time and it draws attention to issues of timing and sequence, distinguishing formative moments or conjunctures from the periods that reinforce divergent paths.

<sup>4</sup> Financial repression: A policy to fund government fiscal imbalances and subsidize priority sectors (McKinnon 1973). This forces financial institutions to pay low and negative real interest rates, reducing private savings and decreasing the resources available to finance capital accumulation.

change is not likely to be a matter of Pareto-improving innovations and why multiple equilibria may exist: inertia, complexity and the involvement of the state.

First, inertia is inherent in institutions. A group of individuals is always likely to lose from an institutional change. The vested interests are continuously being recreated as long as the existing institution remains. What this means is that our understanding of institutional reform is incomplete without being sensitive to the political economy design and environment. The second complication which arises from the complex evolution of institutional change is the unforeseen nature of its consequences. There may be a discrepancy between the reason an institution was initially created and the purposes it currently serves (Pierson, 2000). For institutions to operate, they must create reasonably stable expectations, thus they have to change slowly. An institution adapted to conditions at one moment will persist even when it may no longer be fully optimal<sup>5</sup> (Veblen, 1899; North and Thomas, 1973). Institutions have effects on economic development and on future institutional evolution. The presence of very different financial systems among advanced capitalist countries suggests the possibility of multiple equilibria.

Third, the role of the state cannot be disregarded as the state's involvement with institutions is inherent. It has to decide what kinds of rights and obligations to recognize and enforce. Booth, Melling and Dartmann (1997) add that if we include a role for the state in the study of institutions, we must also consider international political pressures. For instance, it is pertinent to consider the role played by the International Monetary Fund in the evolution of financial systems in developing countries.

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<sup>5</sup> This argument is analogous to biological evolution, where the species that exists are not 'optimal' but they carry within them the remains of past adaptations which have influenced the course of future developments.

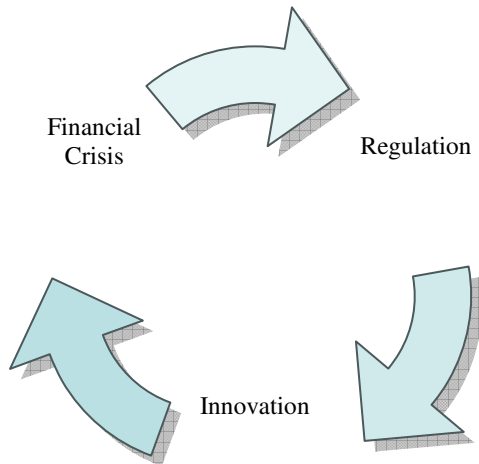
### *Institutional change as a function of an exogenous shock*

Given that institutions are characterized by “a great deal of imitation, inertia, lock-in and ‘cumulative causation’”, historical institutionalists address change by proposing a punctuated equilibrium model which predicts that institutions, once created, either persist or break down in the face of some exogenous shock (Hodgson, 1998, p.171). There are brief critical junctures in which opportunities for major institutional reforms appear, followed by long stretches of institutional stability. These episodes are significant as they place institutional arrangements on trajectories which become difficult to alter. Such path dependency arguments view institutional change as a function of a shock that disrupts previously stable arrangements and unlocks opportunities for institutional innovation (Thelen, 2003; Pierson, 2004).

Some economists conceptualize regulatory governance reform in the financial economy as a cyclical process (Figure 1) consisting of three parts: financial crisis, regulation and innovation (Hubbard, 1994). First, the presence of asymmetric information in the financial economy creates adverse selection and moral hazard problems. These problems may have the potential to create instability, leading to a crisis which is a shock in the financial system. Next, the financial crisis affects individuals and firms, who exert political pressure and prompt the government to intervene and impose regulatory changes. Much of the underlying rationale behind good regulatory governance involves designing rules to align incentive structures that will prevent the exploitation of conflicts of interest. Subsequently, driven by profit maximization, financial institutions respond to the obstacles or opportunities created through major regulatory intervention by innovating in their activities and services offered. Voracious innovation, if unchecked, may in turn result in another financial crisis.

If financial liberalization does magnify the likelihood of a financial crisis, we can infer from the cycle of crisis and regulatory response that financial crisis is a proximate cause of institutional reform, while financial liberalization is the ultimate cause of institutional reform.

**Figure 1: The Cycle of Crisis and Regulatory Response**



Financial liberalization may be a necessary, but not sufficient condition driving institutional reform. Financial liberalization may spur institutional reforms, as the process of liberalization changes the incentives for governments to design and implement regulations that prevent or correct market failures, rather than reinforce or ignore them. This hypothesis concurs with the intuition in the historical institutionalist’s punctuated equilibrium model of what drives institutional reform. The exogenous shock required to spur institutional reform may take the form of foreign competition from liberalizing the financial sector. The benefits of financial liberalization are enhanced with better institutions while the costs of allowing weak institutions to persist rise dramatically because ill-conceived attempts at financial liberalization increases the likelihood of exchange rate speculation and banking crises. Besides increasing what is at stake, financial liberalization also increases the number of players. The pressure for reform may come from external sources such as the International Monetary Fund and foreign investors. In addition, there may be a “learning by doing” process in institutional development and reform after a country is liberalized. Thus,

international capital markets can help discipline policymakers, who might be tempted to exploit an otherwise captive domestic capital market.

While theoretical work on institutional genesis and development has advanced, empirical work in the specific field of regulatory governance reform in the financial economy is still limited. There has been no model or theory developed for understanding the interaction of regulatory governance reform and financial liberalization in financial market development. By exploring the dynamics between regulatory governance reform and financial liberalization, this paper extends the financial market development literature and informs future researchers who are interested in developing a formal theory.

#### **IV. Data**

Economists recognize that since institutions are complex, they do not lend themselves easily to quantitative measurement. As a result, the statistical approach of applied economics is not straightforwardly applicable. There is no clearly identifiable set of best practices on how to quantify a complex phenomenon such as regulatory governance or financial liberalization<sup>6</sup>, the two key variables in this research paper. The quality of regulatory governance depends on a broad range of elements that are not easily measurable. These elements include the structure of the financial system and markets; regulations regarding accounting standards, and disclosure requirements; loan classification, provisioning and income recognition rules, and other prudential regulations; the quality of supervision of financial institutions; the legal infrastructure (including the areas of bankruptcy and foreclosure); incentive structures and safety nets (Evans, Leone, Gill and Hilbers, 2000).

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<sup>6</sup> Capital account liberalization is one aspect of financial liberalization. Eichengreen (2001) notes that developing adequate measures of capital account restrictions is a particular problem for the literature on the causes and effects of capital account liberalization, but also the broader problem of adequately capturing the economic, financial, and political characteristics of economies, which impinges on cross-country empirical work of this sort, should not be overlooked.

Hence, qualitative information on institutional circumstances, combined with informed judgment, is essential to complement any quantitative analysis of such studies.

*Data Coverage*

The data consists of 17 emerging markets in East Asia, South Asia and Latin America and the period of study is from 1973 to 2003 (Table 1). The financial economies in these regions have undergone significant financial liberalization and developments in the period of study and are comparable market economies. Eastern European countries, China and Vietnam are omitted because they are transitioning from a planned economy and hence, face a unique set of developmental challenges. In addition, countries in Africa are not included because of the low level of financial market development in most of these economies. Regrettably, one of the weaknesses of the data set is the number of countries covered. It would be better if the coverage could be broadened to include a greater number of emerging markets such as Hong Kong, Singapore, Ecuador, Portugal or Greece. However, due to data scarcity in many of these countries, this is not possible.

**Table 1: Data set coverage**

<b>Region</b>	<b>No. of countries</b>	<b>Countries</b>
<i>East Asia</i>	6	Indonesia Malaysia The Philippines South Korea Taiwan Thailand
<i>South Asia</i>	4	Bangladesh India Pakistan Sri Lanka
<i>Latin America</i>	7	Argentina Brazil Chile Colombia Mexico Peru Venezuela
<b>Total</b>		<b>17 Countries</b>



### *Financial Liberalization Variable*

Since the 1980s, many developing countries have liberalized their capital account, domestic banking sector and stock market. Liberalization of the capital account may take the form of removing controls on international capital movements, while liberalization of the banking sector comprises changes that enable market forces to allocate capital such as abolishing interest rate floors and ceilings, removing rules awarding credit to “preferential” sectors, or encouraging competition from foreign financial institutions. Liberalization of the stock market entails allowing foreigners to acquire shares in the domestic stock market and allowing securities short-selling.

In this paper, Kaminsky and Schmukler’s (2003) panel index is used as a proxy for financial liberalization. The data set incorporates three dimensions of financial liberalization, namely the capital account, domestic financial sector and stock market. Unfortunately, the insurance sector is not included. The original data set comprises of 28 developed and emerging markets from 1973 to 1998<sup>7</sup>. The data set consists of the East Asian and Latin American economies, but not the South Asian economies. Using qualitative information from Bekaert and Harvey’s (2004) detailed chronology of economic, political and financial events in emerging markets, I created the financial liberalization index for the South Asian countries and extended the coverage from 1999 to 2003 for the East Asian and Latin American economies by replicating the methodology used by Kaminsky and Schmukler. In the aftermath of the East Asian financial crisis in 1997, significant changes in both financial liberalization and regulatory governance have occurred, thus the latter period is crucial to a complete analysis.

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<sup>7</sup> The authors compile the data set using qualitative information from a broad range of sources. The references used to construct the chronology of financial liberalization are listed in Annex Table 2 of their paper.

Each of the three sectors is classified into one of three regimes, “full liberalization”, “partial liberalization” or “no liberalization”<sup>8</sup>. A country is considered to be fully liberalized when at least two sectors are fully liberalized and the third one is partially liberalized. A country is classified as partially liberalized when at least two sectors are partially liberalized. In all other cases, a country is considered not liberalized. Appendix Table A1 describes in detail the criteria used to define the components of the financial liberalization index.

One of the strengths of this data set is that it provides a more comprehensive measurement of liberalization in three sectors of the financial market, as opposed to other existing measures which are often limited to only one particular sector. Appendix Table A2 outlines some of the financial liberalization indicators used in earlier studies and highlights their characteristics, strengths and weaknesses. These other financial liberalization proxies are simple indicators that only capture a narrow dimension of the financial economy, in contrast to Kaminsky and Schmukler’s more comprehensive index. In addition, the index captures more nuanced elements of liberalization intensity, as well as episode reversals.

#### *Regulatory Governance Variable*

In this paper, institutional reform specifically refers to changes in the formal<sup>9</sup> regulatory governance of the financial system, not broad public sector governance. Good regulatory governance is the capacity to manage resources efficiently, and to formulate,

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<sup>8</sup> For the purposes of this paper, Kaminsky and Schmukler’s original index was re-scaled. Re-scaling the data makes the visual presentation of the financial liberalization and regulatory governance reform variables more intuitive for the reader. In the original index, a country takes a value of 1 when it is financially liberalized, 2 when it is partially liberalized and 3 when it is not financially liberalized. The modified index takes a value of 0 when there is no financial liberalization, 3 when there is partial liberalization and 6 when there is no liberalization. This should not affect the integrity of the data given that the values only represent an ordering, not an absolute level.

<sup>9</sup> The discussion is limited to formal institutions that are the products of conscious design by the state as opposed to informal institutions (including norms, practices and culture) even though informal institutions may be significant, particularly in developing countries with less established legal infrastructure. Tsai (2004, 2003) proposes that informal institutions serve an important intermediate and adaptive role in explaining the process of endogenous institutional change, which in turn, contributes to the stability of formal institutions.

implement and enforce sound prudential policies and regulations related to the financial market. The institutional underpinnings behind good regulatory governance include agency independence, accountability to government, legislature and public, transparency and integrity (Das and Quintyn, 2002).

Das, Quintyn and Chenard (2004) constructed a regulatory governance index for 50 countries in 2001 using data from International Monetary Fund's Financial Sector Assessment Program (FSAP)<sup>10</sup>. Regrettably, this data set is not publicly available. Furthermore, their data set is a cross-section series, not a time series needed to address the sequencing question in this paper. Other researchers like Kaminsky and Schmukler (2003) have used a single variable such as the creation of insider trading laws and the first prosecution of insider trading as a proxy for regulatory governance. This kind of simple indicator is inadequate and too narrow, given that regulatory governance reform is the dependent variable in this paper.

For the purposes of this paper, I constructed a series of regulatory governance variables in the same time-period for the 17 countries. The regulatory governance reform index captures a comprehensive range of major changes instituted in the core areas of the financial market, legal and economic infrastructure. Six broad dimensions of regulatory governance are considered (Table 2). These six dimensions were determined after examining the range and type of regulatory changes adopted throughout the 17 countries during period of study. Qualitative information from Bekaert and Harvey's (2004) detailed chronology of

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<sup>10</sup> The authors constructed the regulatory governance index based on a country's degree of compliance with (I) IMF's Monetary and Fiscal Policy Transparency Code and (II) regulatory standards set by Basel Committee, International Organization for Governmental Securities Commission and the International Association of Insurance Supervisors.

economic, political and financial events in emerging markets, along with The Economist Intelligence Unit Country Finance<sup>11</sup> reports were used to construct the index.

Each of these dimensions is a binary variable, taking the value of 1 when a specific dimension of regulatory governance has been reformed. Reform is noted to have occurred when specific regulations governing the financial economy, as described in the right column of Table 2, are created, modified, abolished or enforced. An aggregate index of these binary variables is used as a proxy for regulatory governance reform. Hence, the index takes values ranging from 0 to 6, with 6 being reform in all the dimensions of the financial sector. The aggregate index reflects only a ranking: the difference between 1 and 2 cannot be treated as equivalent to the difference between 2 and 3. In addition, a high degree of change does not necessarily imply an improvement in regulatory governance.

**Table 2: Regulatory Governance Variables**

<b>Dimension</b>	<b>Creation/ Modification/Abolishment/ Enforcement</b>
<b>Banking</b>	Reserve requirement Capital adequacy ratio Foreign exchange/ property market exposure limits Deposit insurance scheme Non-performing loan regulations Saver's protection Money laundering Regulations regarding automobile/ consumer credit
<b>Securities Issuance and Trading</b>	Existence of insider trading laws New securities/ derivatives market Short/ sales regulation Investor protection Regulation on asset management / derivatives Public debt conversion to equities Payment and settlement system
<b>Corporate governance</b>	Accounting standard Disclosure standard Credit Risk Rating system
<b>Organization changes</b>	Central bank independence Creation/ modification of regulatory/ supervisory agencies/ central securities depository
<b>Enforcement actions</b>	Insider trading prosecution Prosecution of unlawful market conduct such as corruption Suspend financial institutions' licenses

<sup>11</sup> The Economist Intelligence Unit publishes Country Finance reports from 1996 to 2003 for most of the countries, with the exception of Peru.

<b>Basic legal infrastructure</b>	Bankruptcy law Mergers & Acquisitions law
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One weakness of this index is that each of the dimensions is weighted equally, although some may contend that the banking dimension is more significant in many emerging financial markets. Moreover, given that the index consists of binary variables representative of each of the six dimensions, the index does not include information about the intensity of change in a particular dimension.

*Other Control Variables*

Gross domestic product per capita<sup>12</sup> data from the World Development Indicators and the International Country Risk Guide political risk variable (PBS Group Inc, 2004) are used as control variables. The components and weights of the political risk variable are noted in Figure 2. This variable serves as an alternative hypothesis for what drives regulatory governance reform. We may reasonably expect greater degree of reform occurring, if there are significant changes in the political environment of a country.

**Figure 2: Components and weights of ICRG political risk variable**

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<sup>12</sup> The figures are stated in constant 1995 US dollars.

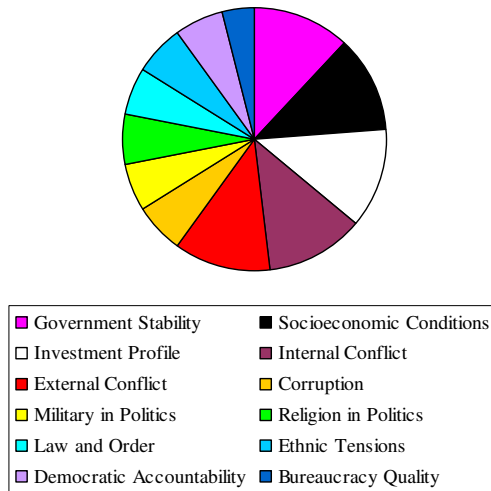


Table 3 displays the summary statistics of financial liberalization, regulatory governance reform and the control variables. Of the three sectors, the domestic financial sector is most liberalized while the capital account is the least liberalized. Reforms take place predominantly in the banking and securities sectors, as the average number of reforms in each of the two dimensions are higher than the mean in the other dimensions. Across all the 17 countries, Figure 3 shows that there is a trend towards a greater degree of financial liberalization from 1973 to 2003. There is also significant variation across the three regions. Although all three regions are fairly comparable in the early 1970s, Latin American and East Asian countries have become more financially liberalized than the South Asian countries since the late 1980s. These observations concur with Simmons and Elkins' (2004) findings that the adoption of liberal economic practices is highly clustered both temporally and spatially. Figure 4 illustrates the aggregate mean of regulatory governance reform in the 17 countries, segregated into the six dimensions. As the countries have liberalized their economies, reforms in more dimensions of the financial economy have occurred.

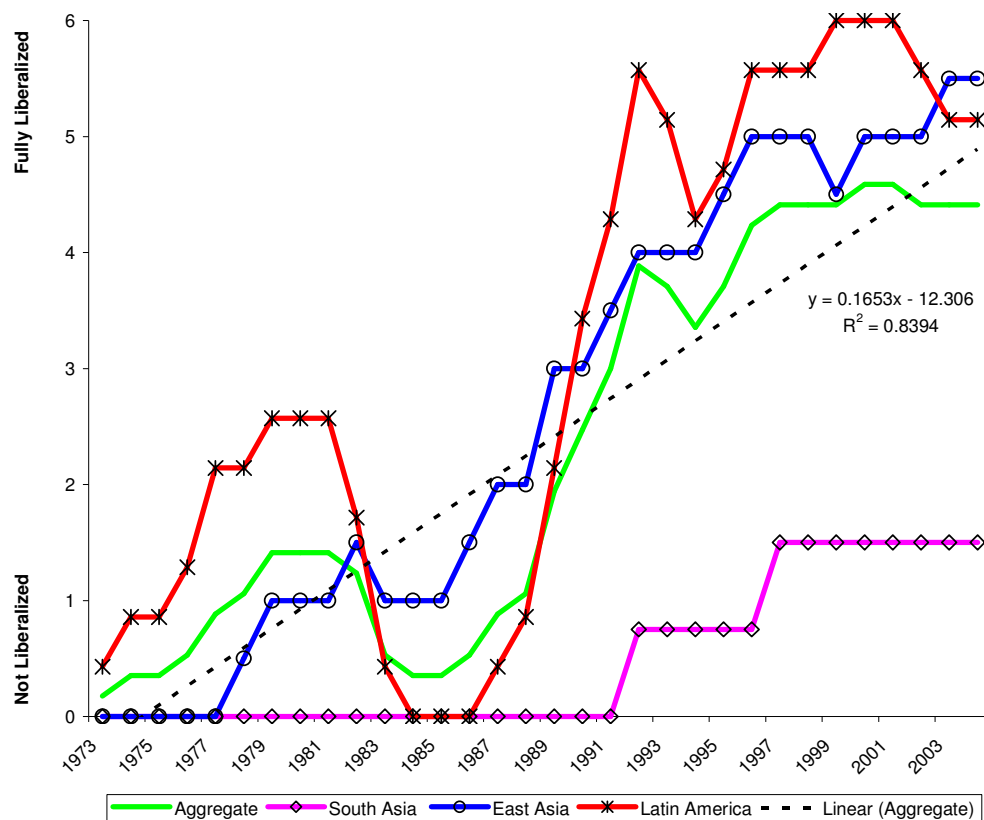
**Table 3: Summary Statistics**

Variable	Obs	Mean	Std Dev	Min	Max	Skewness <sup>13</sup>
<b>Financial Liberalization (Aggregate)</b>	544	2.327	2.472	0	6	0.435
Domestic financial Sector	544	2.994	2.788	0	6	0.004
Capital Account	544	2.217	2.453	0	6	0.512
Stock Market	544	2.471	2.610	0	6	0.349
<b>Regulatory Governance reform* (Aggregate)</b>	544	0.531	0.838	0	5	1.714
Banking	544	0.173	0.378	0	1	1.731
Securities	544	0.217	0.413	0	1	1.374
Corporate Governance	544	0.022	0.147	0	1	6.508
Organizational changes	544	0.029	0.169	0	1	5.570
Enforcement actions	544	0.074	0.261	0	1	3.268
Legal infrastructure	544	0.017	0.128	0	1	7.580
<b>Control Variables</b>						
GDP per capita	496	2660	2513	206	15291	1.861
Political risk**	340	60	12	29	81	-0.472

\* The reform index can take values from 0 to 6.

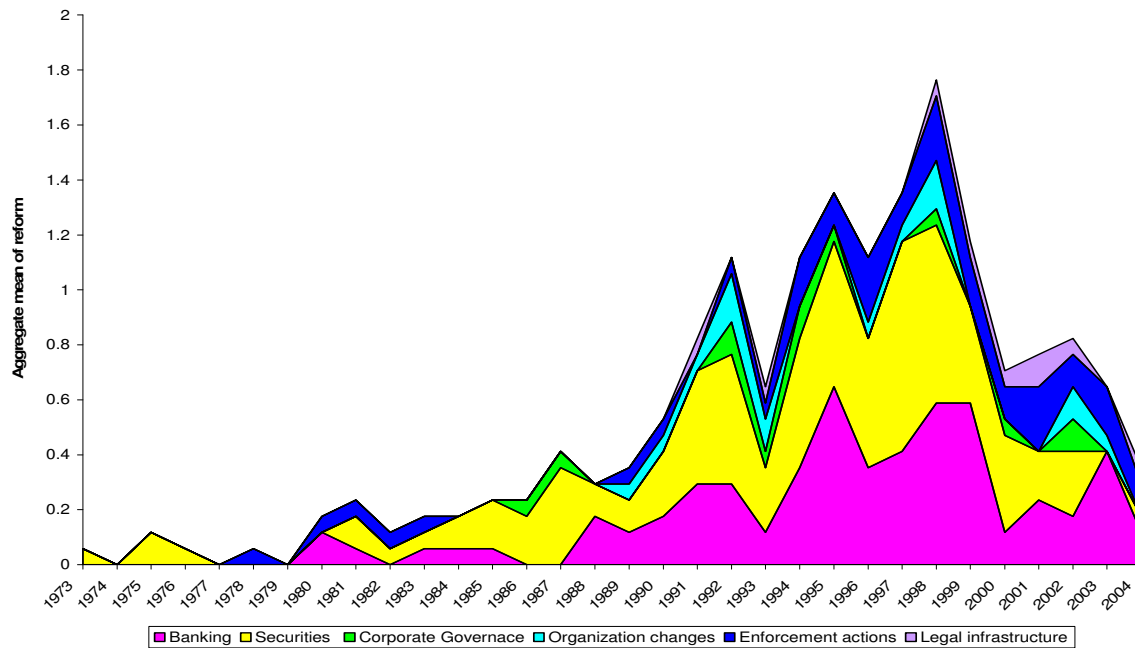
\*\* The political risk variable is on a scale from 0 to 100.

Figure 3: Financial liberalization- Aggregate and regional trends



<sup>13</sup> Skewness measures the degree of asymmetry in the distribution. A value of zero for skewness indicates that the distribution conforms to a normal distribution and the greater the value of skewness, the more asymmetric the distribution.

**Figure 4: Regulatory Governance- Aggregate trend**

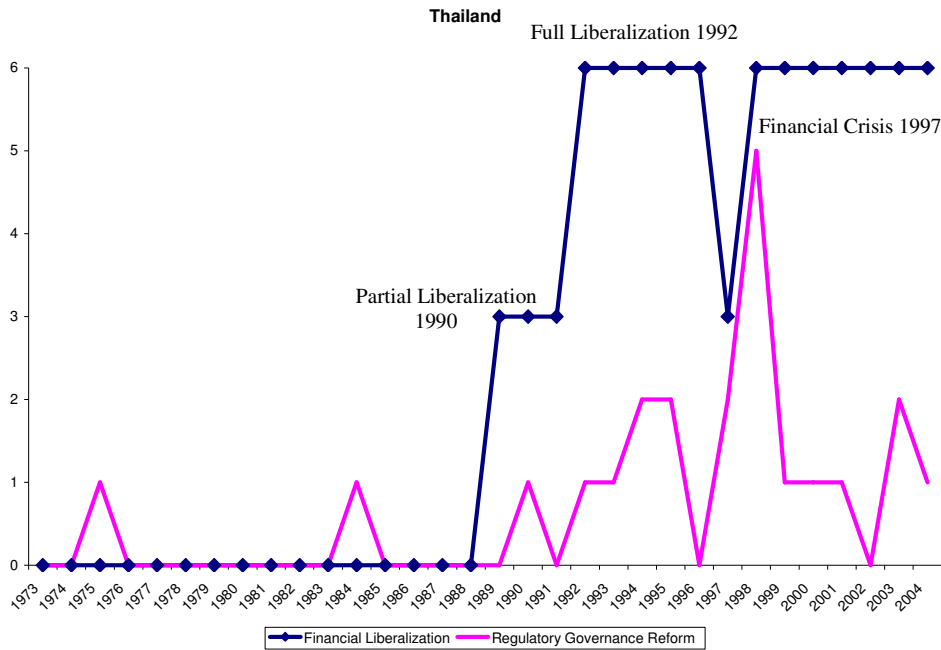


In the case of Thailand, an East Asian country (Figure 5), it is clear that regulatory governance reform increased significantly after the financial market was fully liberalized in 1992. The highest degree of reform occurred in the aftermath of a very severe financial crisis in 1997. This observation provides empirical support for the model of the interaction of financial crisis, regulation and innovation as depicted earlier in the theoretical section. Chile, a Latin American country was partially liberalized in 1979, closed its financial markets for a brief period between 1983 and 1986 and has been fully liberalized since 1992 (Figure 6). Regulatory governance reforms in Chile occurred after its partial liberalization in 1979 and the number of reforms also increased in the immediate aftermath of full liberalization in 1992. As noted earlier, both East Asian and Latin American countries are more liberalized than the South Asian countries. Sri Lanka, a South Asian country was not partially liberalized until 1992. Some reforms have occurred since 1987 and there has been a significant rise in reforms since its partial liberalization (Figure 7). In all three countries, an increase in reforms



often occurred in the wake of financial crises. Graphs illustrating the financial liberalization and regulatory governance reform trends over time for each country in the sample are presented in Appendix 3.

**Figure 5: Thailand**



**Figure 6: Chile**

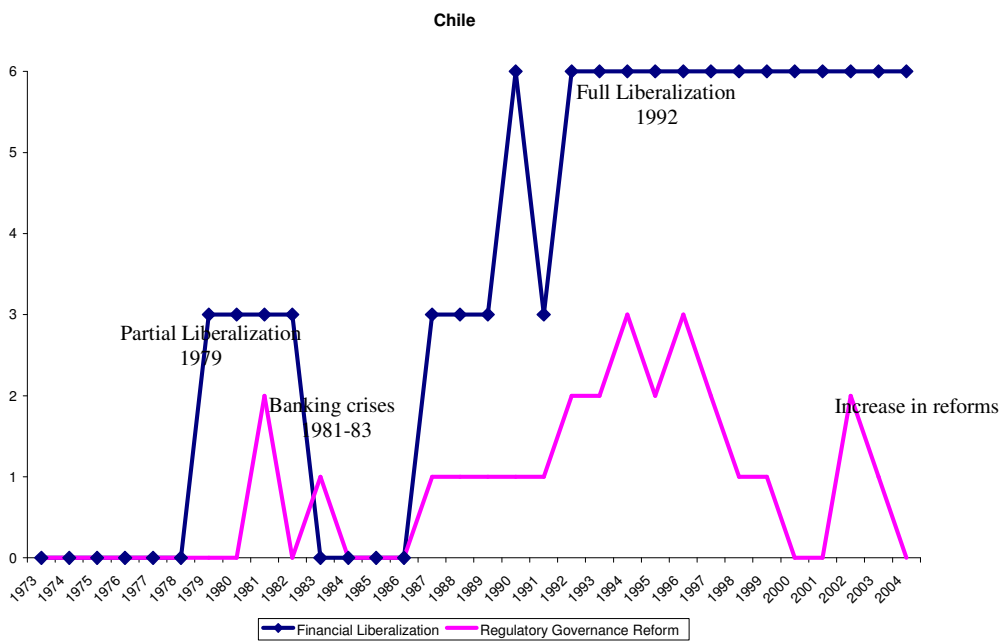
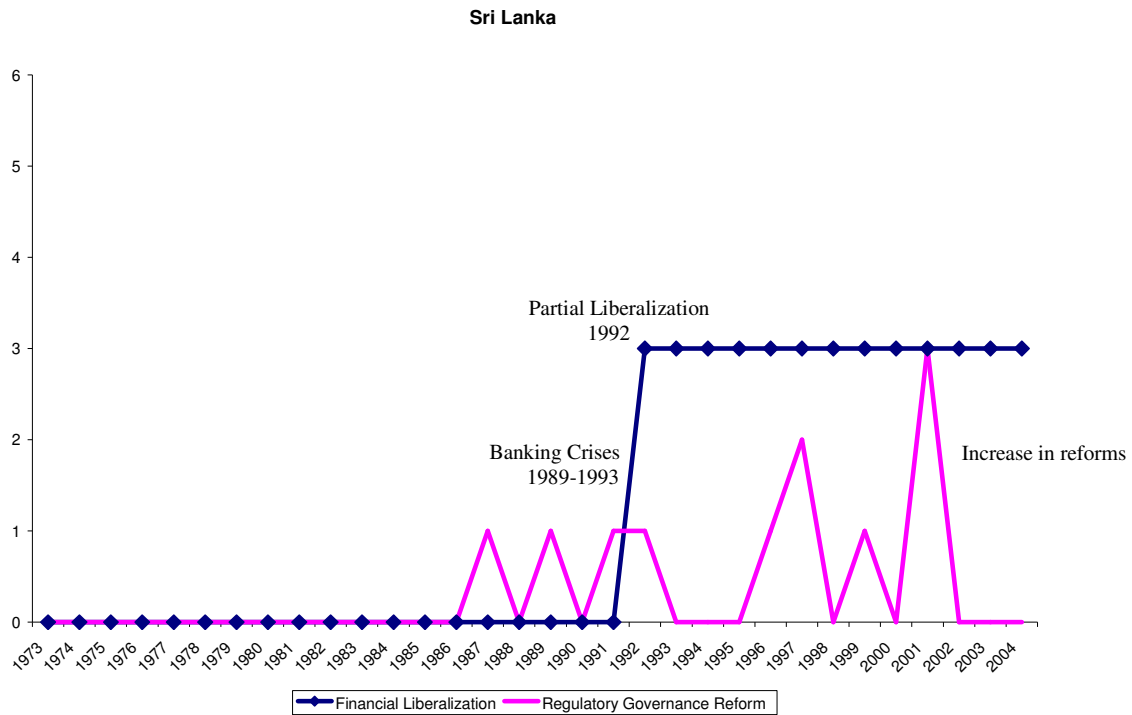


Figure 7: Sri Lanka



## V. Empirical Specification & Findings

### *Ordered Probit Model*

The hypothesis in this paper is that financial liberalization spurs regulatory governance reform. Given the ordinal nature of the polychotomous dependent variable, regulatory governance reform, the ordered probit model<sup>14</sup> is used to test this hypothesis. Maximum likelihood is the method of estimation.

$$y_{it}^* = x_{1,it} \beta_1 + x_{2,it} \beta_2 + x_{3,it} \beta_3 + \varepsilon_{it} \quad 15$$

where  $i$  denotes country &  $t$  denotes time,

$y_{it}^*$  is the probability of regulatory governance reform,

$x_{1,it}$  is the degree of financial liberalization,

$x_{2,it}$  is the level of economic development, as measured by GDP per capita,

<sup>14</sup> Refer to Green (2003) for a more detailed description of the ordered probit model.

<sup>15</sup> The regional dummy variables (East Asia, South Asia and Latin America) and regional variables interacting with the financial liberalization variable are omitted because the regression results are extremely sensitive to the model specification (choice of omitted regional dummy variable). The results are not presented in the paper but are available upon request from the author.

$x_{3, it}$  is a measure of political risk and  
 $\varepsilon_{it}$  is the error term which is assumed to be distributed normally.

In the ordered probit model, the marginal effects of the regressors  $x$  on the probabilities are not equal to the coefficients. If a change in the  $x_1$  value increases the probability of regulatory governance reform, the probability of  $y=6$  increases, while the probability of  $y=0$  decreases, but the probability of being in the intermediate categories could move in either direction. Hence, we should be careful about interpreting the sign and the magnitude of the coefficient in the model. To evaluate the effect of a discrete variable like financial liberalization, we can compare the probabilities that result when the variable takes the three different values (no, partial or full liberalization) with those that occur with the other variables held at their sample means (Greene, 2003, p.740).

If the hypothesis is true, we should expect a positive and significant coefficient for financial liberalization. As for the control variables, the coefficient for GDP per capita should be negative, since we can reasonably expect a significant number of these regulatory governance reforms to take place in the initial stages of development in a financial economy. For instance, we would expect the creation of insider trading laws and the first prosecution of insider trading to take place in the earlier stages of a country's economic development. As for the political risk variable, a country experiencing higher political risk may be more likely to foster an environment favorable to reform, as opposed to a stable country, with low political risk and high institutional inertia. Hence, we would expect a positive and significant coefficient for the political risk variable.

As described in the theoretical section, we expect institutions to exhibit inertia and stability over long periods of time. It would be appropriate to create a lead variable AGGRG5, which accounts for the cumulative number of regulatory governance reforms that

occur in period t, t+1, t+2, t+3 and t+4. The summary statistics of AGGRG5 (Table 4) show that the aggregate mean of reform (AGGRG5) occurring in the next 5 years increases with a greater degree of financial liberalization. This supports the hypothesis that regulatory governance reform is spurred by partial or full financial liberalization, and there is higher institutional inertia when a country is not financially liberalized.

**Table 4: AGGRG5 Summary Statistics**

<b>AGGRG5</b>	<b>Obs</b>	<b>Mean</b>	<b>Std. Dev</b>	<b>Min</b>	<b>Max</b>
No financial liberalization	249	1.393	1.917	0	9
Partial financial liberalization	133	3.857	3.358	0	16
Full financial liberalization	94	5.085	3.168	0	12
Overall	476	2.811	3.066	0	16

Using AGGRG5, we can estimate the conditional probability of reform occurring in the next five periods (including period t), given the current state of financial liberalization. The regression results show that the coefficient of the financial liberalization variable is positive and significant and the coefficients and signs of the control variables are in line with one's expectations (Table 5). The low pseudo R<sup>2</sup> is not surprising, given that the simple model attempts to forecast the occurrence of a very complex phenomenon, regulatory governance reform.

**Table 5: Regression results using ordered probit model and AGGRG5**

<b>AGGRG5</b>	<b>Ordered Probit</b>
Financial Liberalization	0.109 (0.030)*** <i>0.000</i>
GDP per capita	-0.000127 (0.0000304)*** <i>0.000</i>
Political Risk	0.044 (0.008)*** <i>0.000</i>
Pseudo R <sup>2</sup>	0.059
Wald Test (non-linear and linear) on beta of FL <sup>16</sup>	<i>0.0002***</i>
Standard errors in parentheses P values in italics	

<sup>16</sup> The figure reported is the probability of the coefficient > Chi<sup>2</sup>

\* significant at 5% ;\*\* significant at 1% ; \*\*\*significant at 0.1%

Table 6 shows the marginal change of the predicted probabilities when AGGRG5=3, holding the control variables at their sample means. The coefficients of the liberalization variable are significant only when there is partial or full liberalization, providing more support for the hypothesis that financial liberalization spurs regulatory reform. In addition, I computed the predicted probabilities<sup>17</sup> for countries which are not liberalized, partially liberalized or fully liberalized, holding the control variables at their sample means. There is a 22% increase in the predicted probabilities of more than six regulatory governance reforms occurring when there is full liberalization as compared to when there is no liberalization. Conversely, there is a 21% decrease in the predicted probabilities of two or less reforms occurring when there is full liberalization, compared to when there is no liberalization (Table 7). Figure 8 illustrates the results in Table 7. These results predict that regulatory governance reforms are more likely to occur when there is full liberalization than when there is no liberalization. The results concur with Kaminsky and Schmukler's (2003) findings that law and order, as well as insider trading prosecution, improves substantially after partial and full liberalization.

**Table 6: Marginal change in predicted probabilities when AGGRG5=3**

<b>Y=AGGRG5</b>	<b>dy/dx</b>
X=no financial liberalization	-0.002 (0.009) 0.857
X=partial financial liberalization	-0.008 (0.003)** 0.006
X=full financial liberalization	-0.013 (0.005)** 0.007

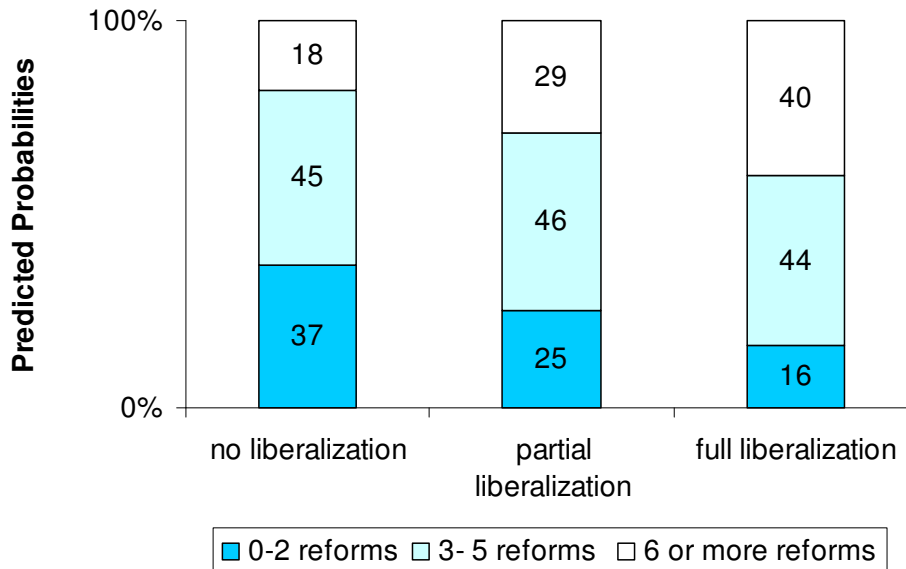
**Table 7: Predicted probabilities of AGGRG5, given different states of liberalization**

<b>Predicted Probabilities</b>	<b>no liberalization</b>	<b>partial liberalization</b>	<b>Full liberalization</b>
0-2 reforms	0.37	0.25	0.16

<sup>17</sup> For a detailed explanation of how predicted probabilities are computed, see Long, Fresse (2003, p. 178)

3-5 reforms	0.45	0.46	0.44
6 or more reforms	0.18	0.29	0.40

**Figure 8: Predicted probabilities of reform, given different states of liberalization**



Another way of analyzing the complex relationship between the sequencing of financial liberalization and regulatory governance reform is to create another variable AGGFL5, which accounts for the cumulative effect of financial liberalization that occurs in period  $t$ ,  $t-1$ ,  $t-2$ ,  $t-3$  and  $t-4$ . This will allow us to estimate the conditional probability of regulatory governance reform in period  $t$ , given the state of financial liberalization in the past five years. The signs and the significance of the coefficients are as one would expect, if the hypothesis is true (Table 8). Table 9 shows the predicted probabilities of reform, given varying degrees of financial liberalization in the past five years. Figure 9 illustrates the predicted probabilities presented in Table 9. The probability of no reform occurring is very high in all states of financial liberalization, indicating high institutional inertia. However, the probability of one or more reforms occurring is the highest when a country has had a medium degree of financial liberalization in the past five years. Hence, one can deduce that the

greatest number of reforms tends to occur when a country is transitioning from a low degree of financial liberalization to a high degree of financial liberalization. The findings show that we cannot reject the hypothesis, that prior financial liberalization is significantly related to the probability of regulatory governance reform.

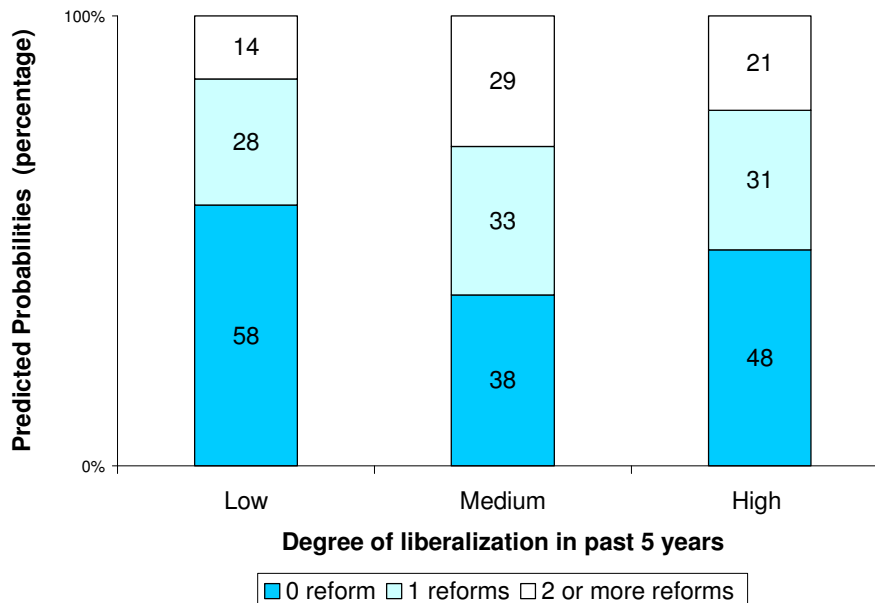
**Table 8: Regression results using ordered probit model and AGGFL5**

Regulatory Governance (RG)	Ordered Probit
Financial Liberalization AGGFL5	0.017 (0.007)** <i>0.015</i>
GDP per capita	-0.0000859 (0.0000286)** <i>0.003</i>
Political Risk	0.036 (0.008)** <i>0.000</i>
Pseudo R <sup>2</sup>	0.063

**Table 9: Predicted probabilities of reform, given different states of financial liberalization in past 5 years**

Predicted Probability	AGGFL5=0 Low degree of financial liberalization	AGGFL5=15 Medium degree of financial liberalization	AGGFL5=30 High degree of financial liberalization
0 reform	0.58	0.38	0.48
1 reform	0.28	0.33	0.31
2 or more reforms	0.14	0.29	0.21

**Figure 9: Predicted probabilities of reform, given different state of financial liberalization**



### *Robustness of Findings*

To test the robustness of the results in Table 5, other aggregate regulatory governance reform variables are created and substituted as the dependent variable in the ordered probit model. AGGRG4 is a variable that captures all regulatory governance reforms that occur in the period  $t$ ,  $t+1$ ,  $t+2$  and  $t+3$ . Similarly, AGGRG3 and AGGRG2 are created. Appendix Table A4 displays the results of the analysis. All the financial liberalization coefficients are positive and significant, and are insensitive to changes in the aggregate number of periods used.

A similar procedure is used to test the robustness of the results in Table 8. AGGFL4 is a variable that proxies for the cumulative effect of financial liberalization that occurs in period  $t$ ,  $t-1$ ,  $t-2$  and  $t-3$ . Similarly, two other variables, AGGFL3 and AGGFL2 are created and substituted in the ordered probit model. Appendix Table A5 shows the results of the analysis. All the financial liberalization coefficients are significant and positive, and are insensitive to changes in the number of periods used. The results from the sensitivity analysis provide evidence to support the robustness of the empirical findings which suggest that financial liberalization spurs regulatory governance reform.

### *Alternative Specifications of the Model*

It should be noted that the objective of this paper is to determine the sequencing of financial liberalization and regulatory governance reform. It is beyond the scope of this paper to estimate the time (number of years,  $n$ ) by which regulatory governance reform occurs, after financial liberalization has occurred, as such an estimation would be complicated by the diversity of political, legal and economic structures in these countries.



Hence, if we introduce lagged variables which account for the specific effect of financial liberalization in a particular year (lagged by  $n$  periods), we are not likely to get significant coefficients. Appendix Table A6 shows the regression results for such an estimation using an ordered probit model. As predicted, the lag variables are not significant. However, using a Wald test, the coefficients of all the financial liberalization variables in the regressions with up to 3 lags are jointly significant while the coefficients of all the financial liberalization variables with 4 or 5 lags are not jointly significant. One way of interpreting the results is that the cumulative effect of financial liberalization, not the effect of a single period of financial liberalization, matters for regulatory governance reform.

In addition, I ran regressions similar to Table 5 using other qualitative response models (ordered logit, Poisson and negative binomial) which are also used to model discrete data. Appendix Table A7 and A8 show the results for AGGRG5 and AGGFL5 respectively. The coefficients of the financial liberalization variable are significant and positive in all of the regressions, regardless of the model specification. Overall, the results in Table 5 are robust to different model specifications.

*Micro-scale effects: Banking and securities reform*

One can also test the hypothesis on a micro-scale. Instead of using the aggregate regulatory governance reform index, the dependent variable can be either banking sector reform or securities sector reform. Since both of these dependent variables are binary, a probit model, instead of an ordered probit model is used to test two sub-hypotheses:

- Liberalization of the domestic financial sector spurs banking sector reform.
- Liberalization of the stock market spurs securities sector reform.

There is evidence supporting the hypothesis that liberalization of the domestic financial sector spurs reform in the banking sector (Table 10 and 11). Table 12 shows the predicted probability of banking reform, given different states of liberalization in the domestic financial sector. There is a 26% increase in the likelihood of banking reform occurring when a country's domestic financial sector has been highly liberalized than when a country's domestic financial sector has not been liberalized. However, the liberalization of the stock market appears to have no effect on reforms in the securities sector. There are two possible reasons for this. First, the stock market is relatively less liberalized and has been liberalized more recently, in contrast to the domestic financial sector which tends to be the first sector to be liberalized. In addition, the recent crises tended to be banking or capital account crises, not stock market crises. Hence, these crises may have induced more meaningful reforms in the banking sector than in the securities sector. For these reasons, the effect of stock market liberalization on reforms in the securities sector may not be evident within the period of study.

**Table 10: Banking and Securities reform**

<b>Probit model</b>	<b>Banking</b>	<b>Securities</b>
Constant	-2.102 (0.488)*** <i>0.000</i>	-2.878 (0.528)*** <i>0.000</i>
Domestic Financial Sector <sup>18</sup> AGGDFS5	0.030 (0.007)*** <i>0.000</i>	
Stock Market AGGSM5		0.003 (0.008) <i>0.662</i>
GDP per capita	-0.0000773 (0.0000362)* <i>0.033</i>	-0.0000868 (0.0000343)* <i>0.011</i>
Political Risk	0.019 (0.009)* <i>0.038</i>	0.043 (0.010)*** <i>0.000</i>
Pseudo R <sup>2</sup>	0.087	0.077

<sup>18</sup> Similar to the creation of earlier aggregate variables, AGGDFS5 refers to the aggregate effect of liberalization of the domestic financial sector in period t, t-1, t-2, t-3 and t-4. AGGSM5 refers to the aggregate effect of liberalization of the stock market in period t, t-1, t-2, t-3 and t-4.

**Table 11: Marginal change in predicted probabilities**

Variable	Banking	Securities
AGGDFS5 dy/dx	0.009 (0.002) *** 0.000	
AGGSM5 dy/dx		0.001 (0.003) 0.662

**Table 12: Predicted probabilities of banking reform, given different states of liberalization in the domestic financial sector**

	AGGDFS5=0 Low degree of liberalization	AGGDFS5=0 Medium degree of liberalization	AGGDFS5=0 High degree of liberalization
No reform	0.88	0.77	0.62
Reform	0.12	0.23	0.38

*Causality issues*

An important caveat on the empirical evidence presented so far is that it only examines “the regulatory cycle effect”, which is that financial liberalization spurs regulatory governance reform. This is only a part of the complex dynamics between financial liberalization and regulatory governance reform<sup>19</sup>. Correlation does not allow for causal inference as causality may run both ways. To address issues of causality, the paper also examines the “anticipation effect”, which is that countries may choose to enact regulatory governance reforms, in anticipation of implementing financial liberalization in the medium term. There may be some kind of “learning effect” after the recent series of financial crises, inducing the interactive inter-play between financial liberalization and regulatory governance reform in less-liberalized economies like the South Asian countries. For instance, in anticipation of a higher degree of financial system instability with impending financial

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<sup>19</sup> An interesting area of further research is to test if there is evidence that countries are implementing the standard policy prescription of developing good institutions prior to financial liberalization. One way of investigating this effect is to run ordered probit regressions using financial liberalization as the dependent variable. The number of regulatory governance reforms that have occurred and other control variables such as degree of trade liberalization will be included as independent variables in the regressions.

liberalization, regulatory governance reforms may occur prior to financial liberalization, to pre-empt the occurrence of disruptive shocks such as financial crises.

To examine the “anticipation effect”, we first run an ordered probit regression that estimates the conditional probability of regulatory governance reforms that have occurred in the past five periods (a lag variable), given the current state of financial liberalization. In this case, the dependent lag variable is PAGGRG5 which accounts for the reforms that have occurred in period t, t-1, t-2, t-3 and t-4. Next, using the two sets of regression results where AGGRG5 (Table 5) and PAGGRG5 (Table 13) are the two dependent variables, we calculate the predicted probabilities of reform when a country is not liberalized, holding GDP per capita and political risk at the sample means. Thus, we can compare the magnitude of the “anticipation effect” with the magnitude of the “regulatory cycle effect” by examining the differences in the predicted probabilities of the lag variable (PAGGRG5) with predicted probabilities of the lead variable (AGGRG5).

Table 13 shows the results of the probability of regulatory governance reform occurring in the past five years (PAGGRG5), given the current state of financial liberalization. The coefficient of the financial liberalization is significant and suggests that causality runs both directions and that there is a dynamic feedback relationship between financial liberalization and regulatory governance reform. The probability that a country will execute three or more reforms increases by 25% when financial liberalization has already been implemented, as compared to when financial liberalization has not been implemented (Table 14). Hence, although causality does run both ways, the magnitude of the “regulatory cycle effect” is greater than the “anticipation effect”. The causality analysis suggests that the

dynamics between financial liberalization and regulatory governance reform are richer than commonly thought.

**Table 13: Regression results using ordered probit model and PAGGRG5**

PAGGRG5	Ordered Probit
Financial Liberalization	0.189 (0.028)*** 0.000
GDP per capita	-0.0000882 (0.0000263)*** 0.001
Political Risk	0.039 (0.007)*** 0.000
Pseudo R <sup>2</sup>	0.0845
Wald Test (non-linear and linear) on beta of FL	0.000***

**Table 14: Comparing predicted probabilities between “regulatory cycle effect” and “anticipation effect”**

Predicted Probabilities	AGGRG5 “Regulatory cycle effect”	PAGGRG5 “Anticipation effect”	Difference	
0 reform	0.1168	0.2128	-0.096	} -0.25
1 reform	0.132	0.2634	-0.1314	
2 reforms	0.1178	0.1427	-0.0249	
3 reforms	0.213	0.1731	<b>0.0399</b>	} 0.25
4 reforms	0.1509	0.0894	<b>0.0615</b>	
5 reforms	0.084	0.0407	<b>0.0433</b>	
6 reforms	0.0775	0.037	<b>0.0405</b>	
7 reforms	0.0497	0.0202	<b>0.0295</b>	
8 reforms	0.0169	0.006	<b>0.0109</b>	
9 reforms	0.023	0.0088	<b>0.0142</b>	
10 reforms	0.0043	0.0015	<b>0.0028</b>	
11 reforms	0.0075	0.0024	<b>0.0051</b>	
12 reforms	0.003	0.0009	<b>0.0021</b>	
13 or more reforms	0.0037	0.0011	<b>0.0026</b>	

## VI. Summary and Policy Implications

Using an ordered probit model and data from 17 emerging financial economies between 1973 and 2004, the results show that the likelihood of regulatory governance reform increases after partial and full financial liberalization. In the case of no financial liberalization, there is significantly higher institutional inertia. On a micro-scale, using a probit model, there is evidence supporting the hypothesis that liberalization of the domestic

financial sector spurs banking reforms. The empirical evidence supports the hypothesis that there are very severe political constraints and institutional inertia that may hinder regulatory governance reform prior to financial liberalization. If the goal is to develop good regulatory governance, partial financial liberalization may be necessary to induce institutional reform.

However, although financial liberalization introduces a greater degree of market discipline, it may not be sufficient to drive meaningful regulatory governance reform. If this is true, the relationship between financial liberalization, crises and regulatory governance reform may be more nuanced and dynamic than commonly thought. As earlier empirical studies have shown, financial liberalization, when hastily implemented without adequate regulatory governance, increases financial system instability and heightens the likelihood of a crisis. Yet ironically, financial liberalization, when only partial implemented, can induce incremental regulatory governance reform, and only in the wake of a financial crisis will opportunities for meaningful regulatory governance reform arise. It would be interesting to do further research that quantifies the impact of financial liberalization, taking into account the social benefit of better institutions, as well as the social cost of increased financial system instability.

By examining the complex dynamics in the interaction of regulatory governance reform and financial liberalization, this paper extends the financial market development literature and informs researchers who are interested in developing a formal theory. An important extension of this research is to trace the exact mechanisms of the “regulatory cycle effect” and the “anticipation effect” and incorporate the dynamic relationship between regulatory governance reform and financial liberalization in a formal theory of financial market development.



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**Appendix Table A1: Criteria to Define Liberalization Periods<sup>20</sup>**

<b>CAPITAL ACCOUNT</b>	
<b>Criteria for Full Liberalization</b>	
Borrowing abroad by banks and corporations	Banks and corporations are allowed to borrow abroad mostly freely. They may need to inform the authorities, but the authorization is granted almost automatically. Reserve requirements might be in place but are lower than 10 percent. The required minimum maturity is not longer than two years.
Multiple exchange rates and other restrictions	<i>And</i> There are no special exchange rates for either current account or capital account transactions. There are no restrictions to capital outflows.
<b>Criteria for Partial Liberalization</b>	
Borrowing abroad by banks and corporations	Banks and corporations are allowed to borrow abroad but subject to certain restrictions. Reserve requirements might be between 10 and 50 percent. The required minimum maturity might be between two and five years. There might be some caps in borrowing and certain restrictions to specific sectors.
Multiple exchange rates and other restrictions	<i>Or</i> There are special exchange rates for current account and capital account transactions. There might be some restrictions to capital outflows.
<b>Criteria for No Liberalization</b>	
Borrowing abroad by banks and corporations	Banks and corporations are mostly not allowed to borrow abroad. Reserve requirements might be higher than 50 percent. The required minimum maturity might be longer than five years. There might be caps in borrowing and heavy restrictions to certain sectors.
Multiple exchange rates and other restrictions	<i>Or</i> There are special exchange rates for current account and capital account transactions. There might be restrictions to capital outflows.
<b>DOMESTIC FINANCIAL SECTOR</b>	
<b>Criteria for Full Liberalization</b>	
Lending and borrowing interest rates	There are no controls (ceilings and floors) on interest rates.
Other indicators	<i>And</i> There are likely no credit controls (subsidies to certain sectors or certain credit allocations). Deposits in foreign currencies are likely permitted.
<b>Criteria for Partial Liberalization</b>	
Lending and borrowing interest rates	There are controls in either lending or borrowing rates (ceilings or floors).
Other indicators	<i>And</i> There might be controls in the allocation of credit controls (subsidies to certain sectors or certain credit allocations). Deposits in foreign currencies might not be permitted.
<b>Criteria for No Liberalization</b>	
Lending and borrowing interest rates	There are controls in lending rates and borrowing rates (ceilings and floors).
Other indicators	<i>And</i> There are likely controls in the allocation of credit controls (subsidies to certain sectors or certain credit allocations). Deposits in foreign currencies are likely not permitted.
<b>STOCK MARKET</b>	
<b>Criteria for Full Liberalization</b>	
Acquisition by foreign investors	Foreign investors are allowed to hold domestic equity without restrictions.

<sup>20</sup> This table is adapted from Appendix Table I of Kaminsky and Schmukler's paper. The technicalities of the criteria used to determine how each of the sectors is categorized in a particular regime are further discussed in their paper.

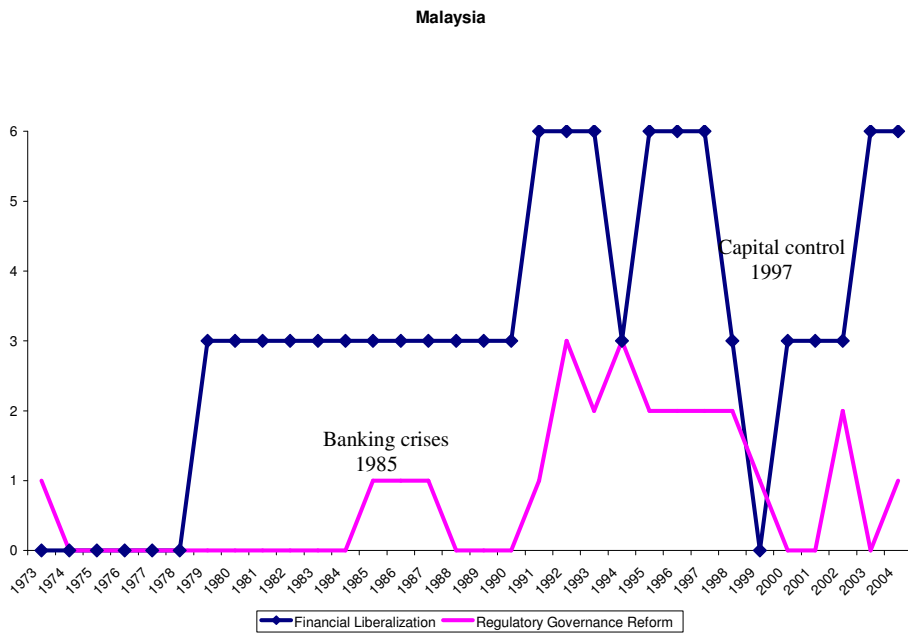
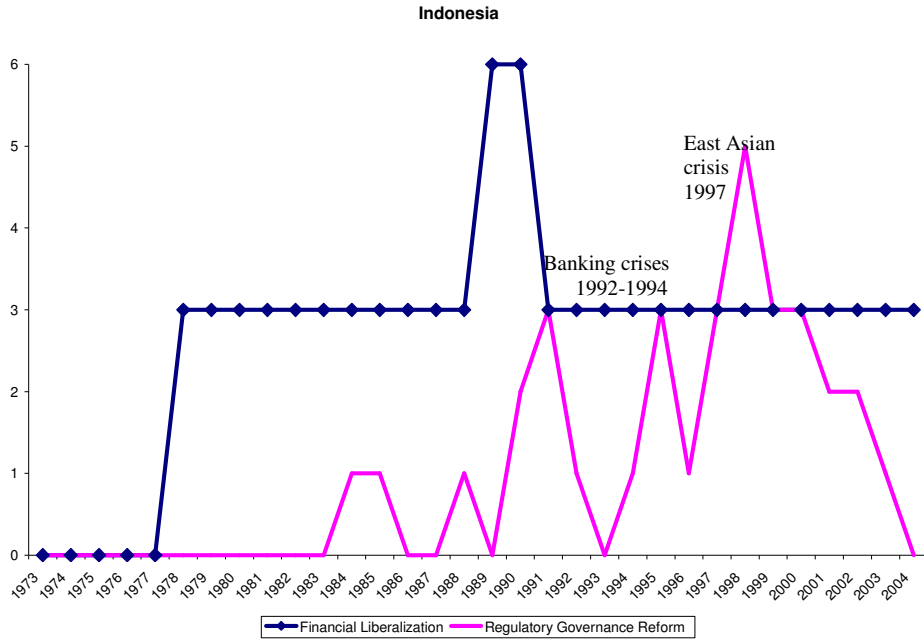
Repatriation of capital, dividends, and interest	<i>And</i> Capital, dividends, and interest can be repatriated freely within two years of the initial investment.
<b>Criteria for Partial Liberalization</b>	
Acquisition by foreign investors	Foreign investors are allowed to hold up to 49 percent of each company's outstanding equity. There might be restrictions to participate in certain sectors. There might be indirect ways to invest in the stock market, like through country funds.
Repatriation of capital, dividends, and interest	<i>Or</i> Capital, dividends, and interest can be repatriated, but typically not before two and not after five years of the initial investment.
<b>Criteria for No Liberalization</b>	
Acquisition by foreign investors	Foreign investors are not allowed to hold domestic equity.
Repatriation of capital, dividends, and interest	<i>Or</i> Capital, dividends, and interest can be repatriated, but not before five years of the initial investment.
This table describes the criteria used to determine whether the capital account, the domestic financial sector, and the stock market are fully or partially liberalized.	

**Appendix Table A2: Indicators of financial liberalization used by other researchers**

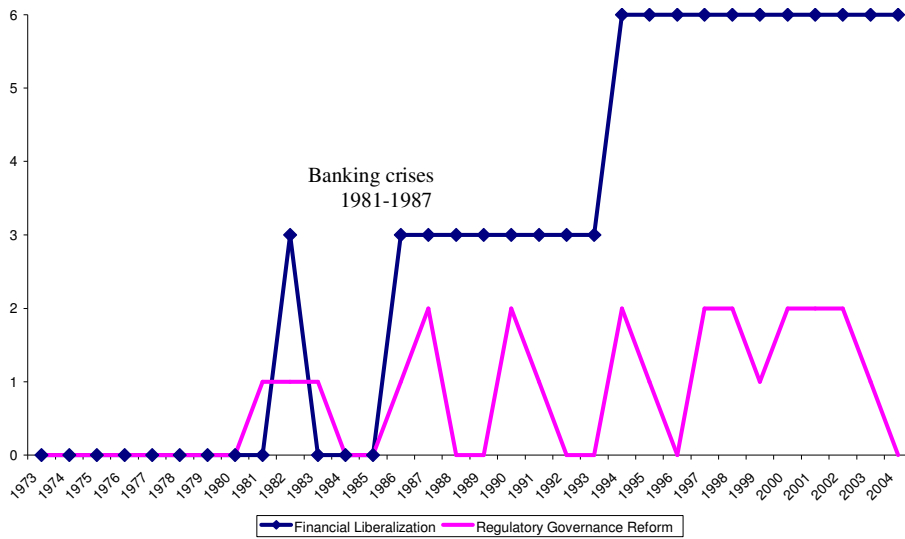
<b>Liberalization</b>	<b>Indicator</b>	<b>Characteristics, Strengths and Weaknesses</b>
<i>Capital Account Sector</i>	IMF Exchange Arrangements and Exchange Restrictions	Two types of regimes: <ul style="list-style-type: none"> <li>▪ No controls</li> <li>▪ Controls</li> </ul> Does not distinguish between capital inflow or outflow
<i>Domestic Financial System Sector</i>	Williamson and Mahar (1998)	5 Distinct Dimensions <ul style="list-style-type: none"> <li>▪ Existence of credit controls</li> <li>▪ Controls on interest rate</li> <li>▪ Entry barriers to banking industry</li> <li>▪ Government regulation of banking sector</li> <li>▪ Government-owned banks</li> </ul>
	Demirguc-Kunt and Detragiache (1999)	Liberalization of domestic interest rates
<i>Stock Market Sector</i>	International Financial Corporation (IFC)	Only emerging markets Two types of regimes: <ul style="list-style-type: none"> <li>▪ “liberalized”</li> <li>▪ “restricted”</li> </ul> Determined on whether foreigners allowed to purchase shares of listed companies in domestic stock market and whether there is free repatriation of capital and remittance of dividends and capital gains
	Bekaert and Harvey (2000)	Only emerging markets Using IFC data and establishment of new investment vehicles such as country funds and depository receipts

### Appendix 3: Country graphs

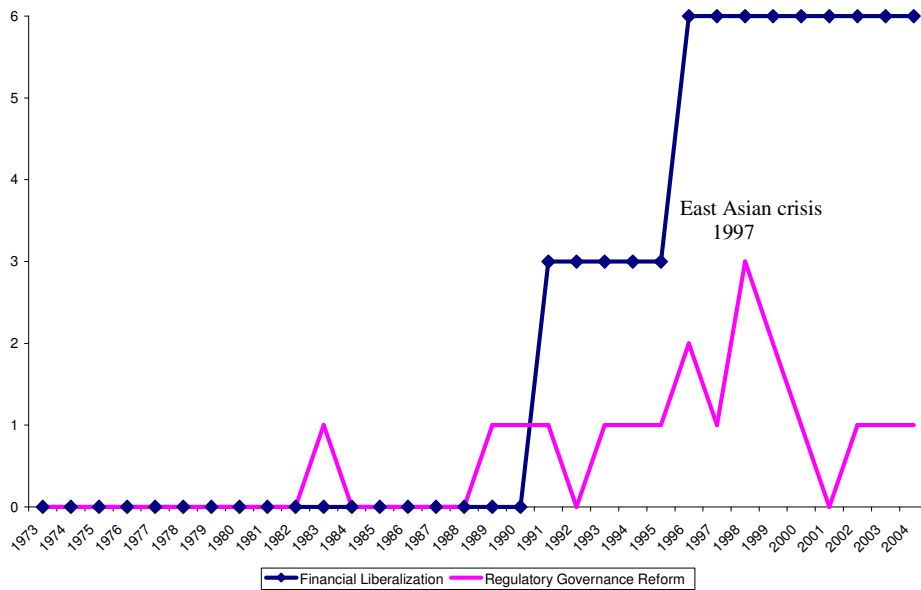
#### I. East Asia



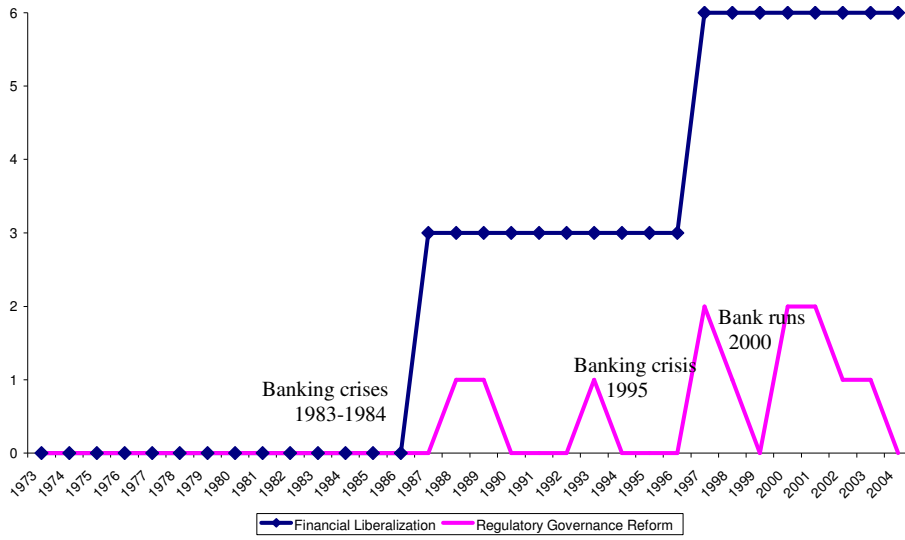
### Philippines



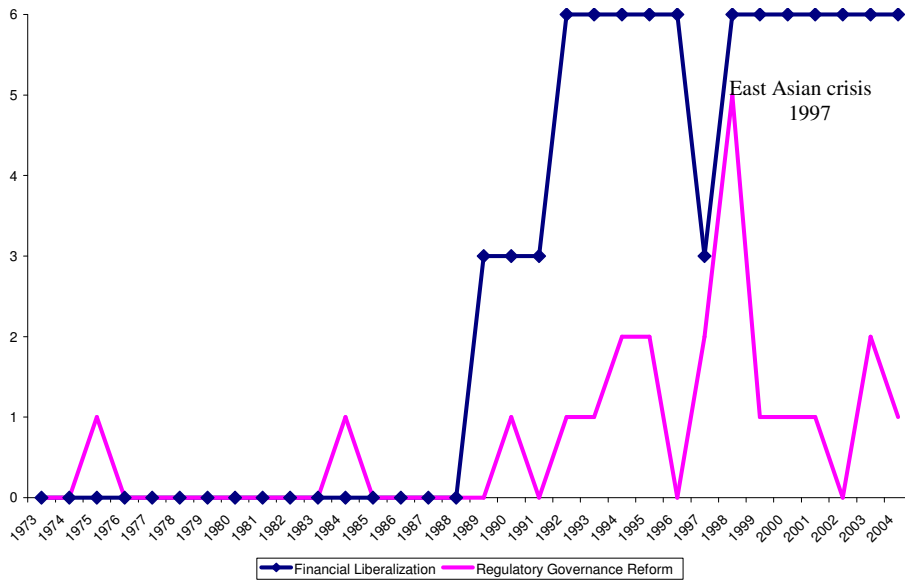
### Korea



### Taiwan

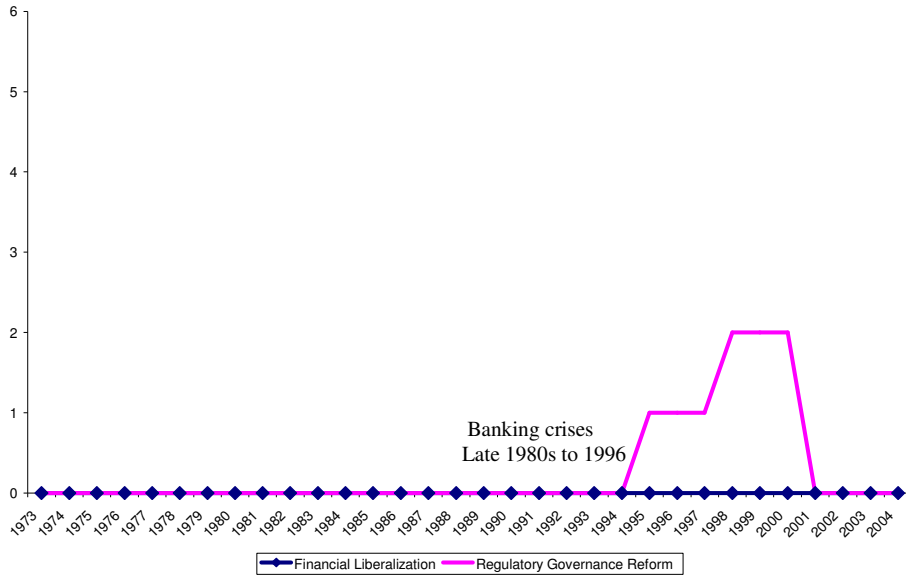


### Thailand

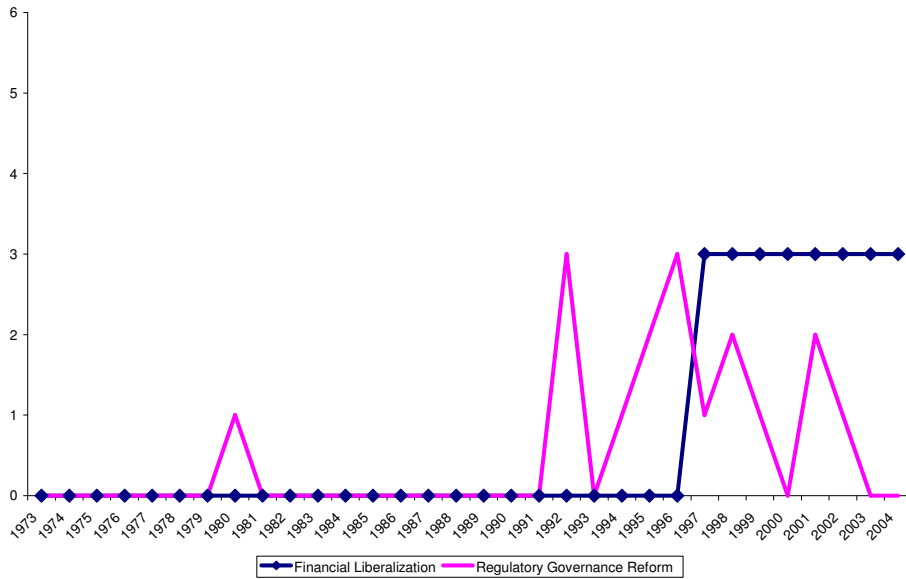


## II. South Asia

### Bangladesh

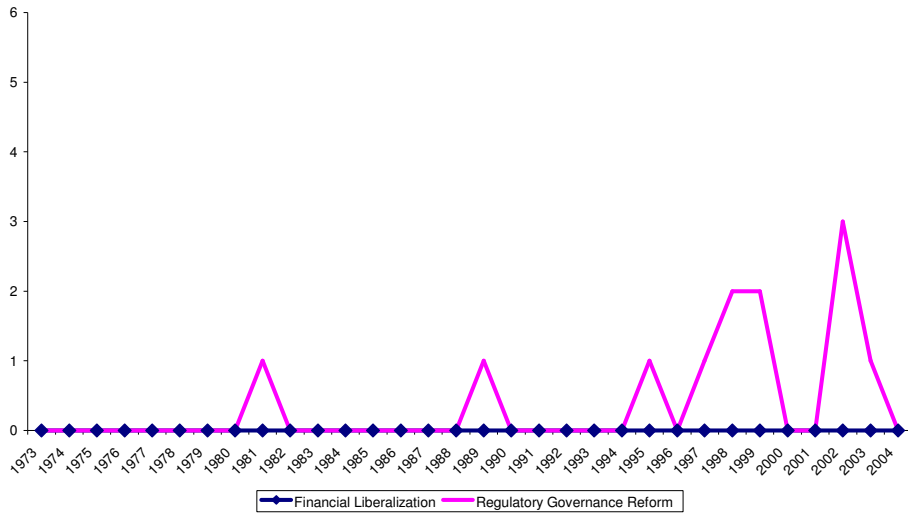


### India

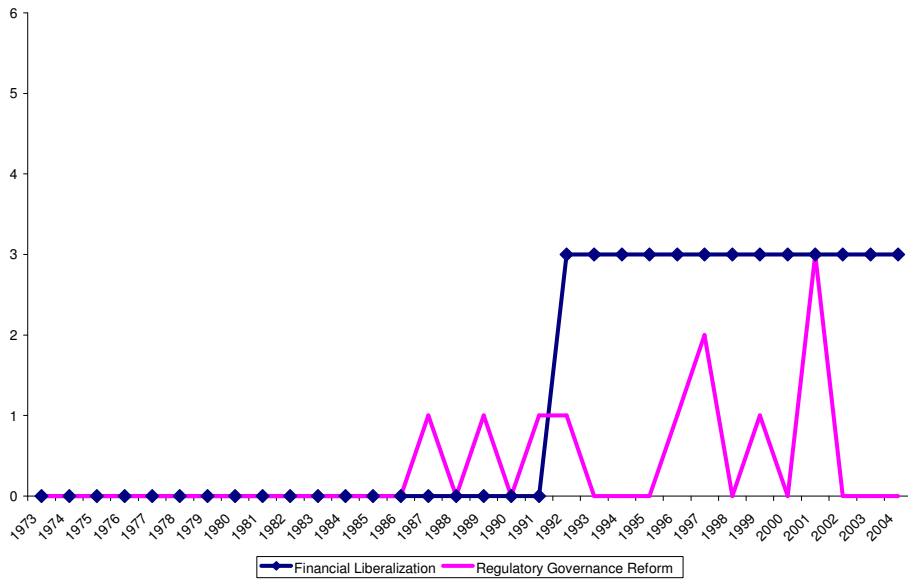




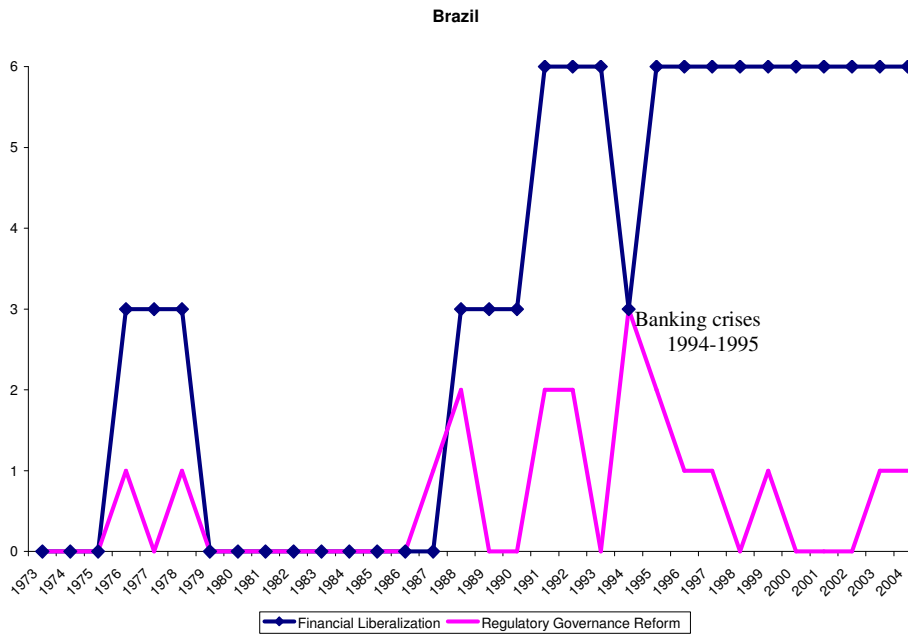
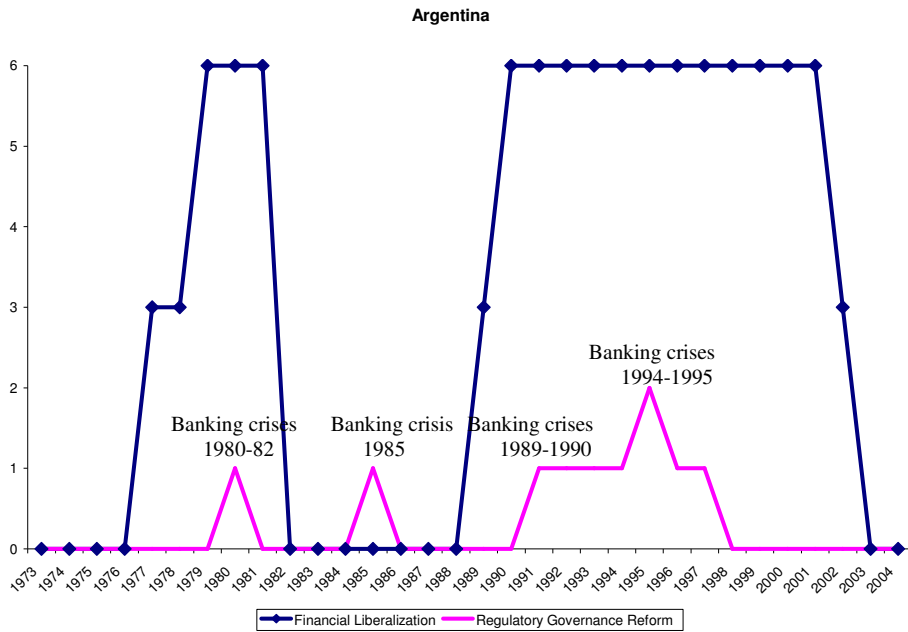
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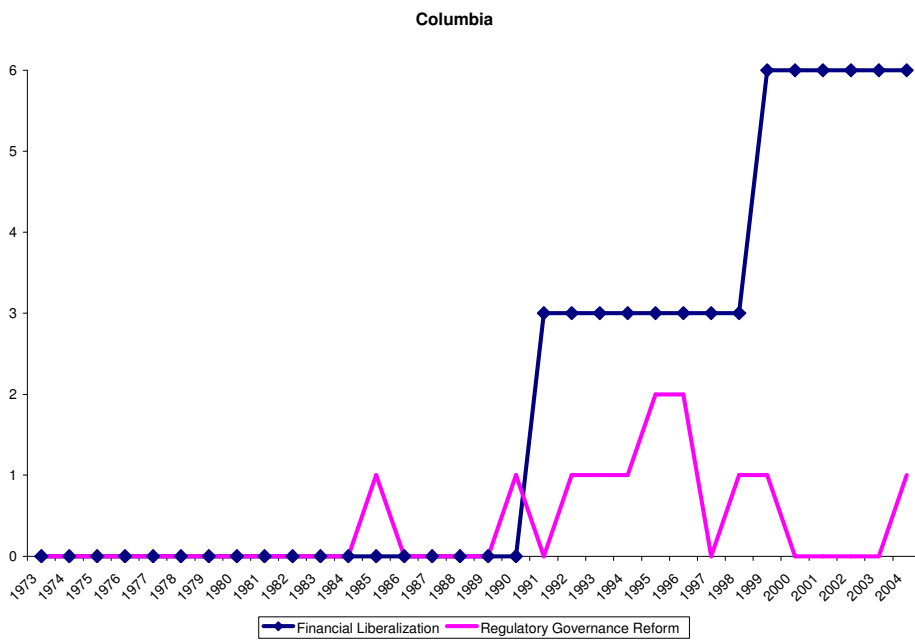
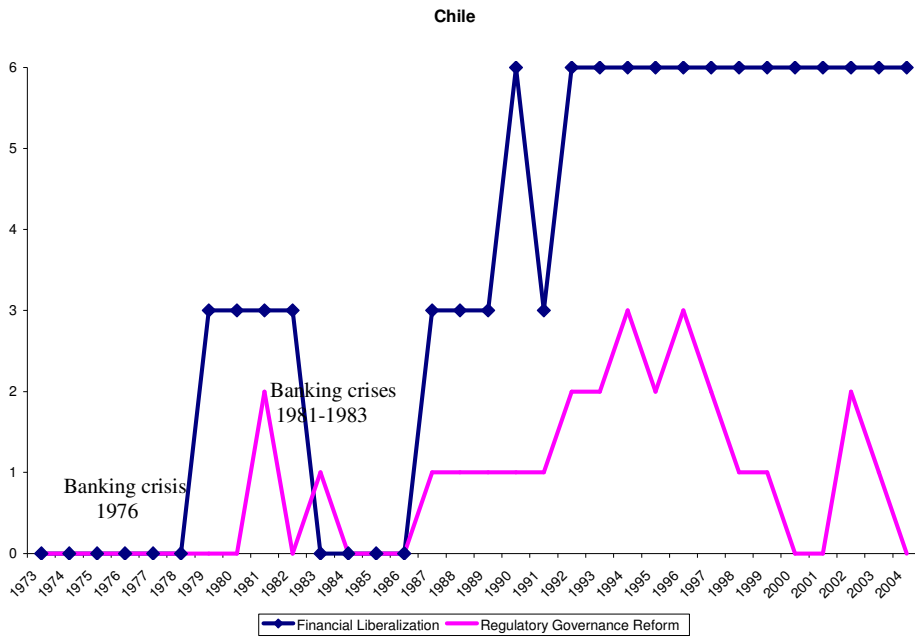


### Sri Lanka

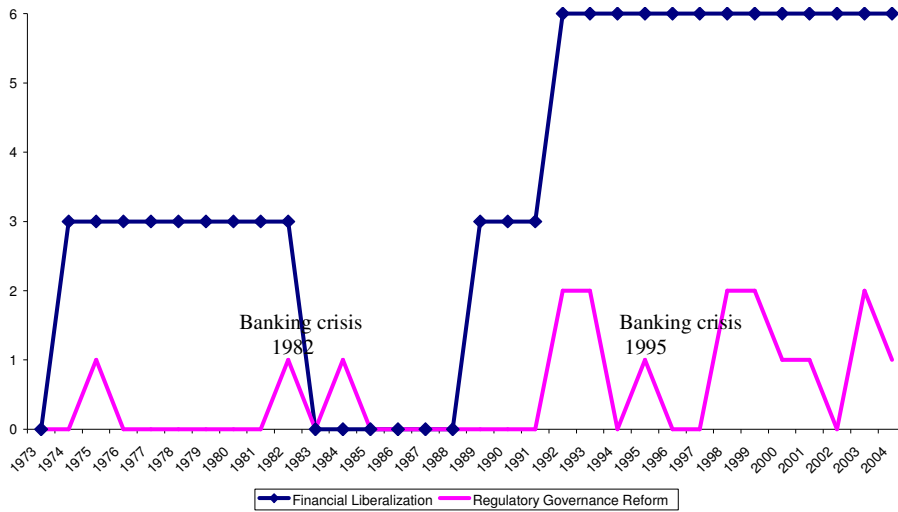


### III. Latin America

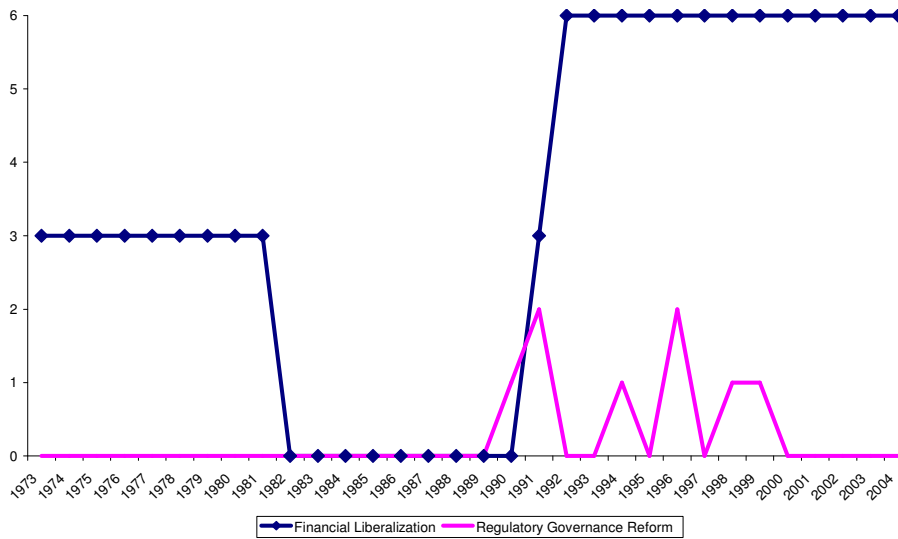




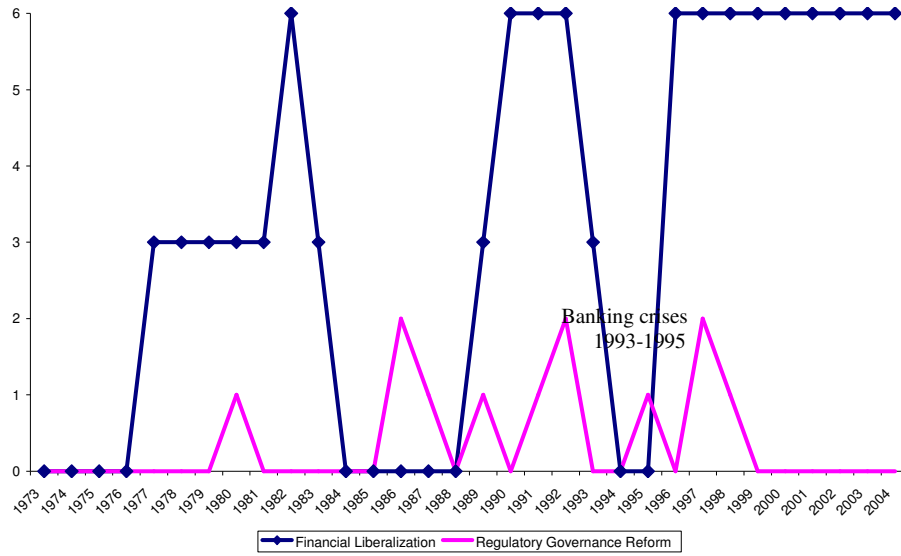
### Mexico



### Peru



### Venezuela



**Appendix Table A4: Regression results using ordered probit model and different RGs**

Dependent Variable	RG	AGGRG2	AGGRG3	AGGRG4	AGGRG5
Financial Liberalization	0.092 (0.031)** 0.003	0.097 (0.0295)*** 0.001	0.103 (0.029)*** 0.000	0.106 (0.029)*** 0.000	0.109 (0.030)*** 0.000
GDP per capita	-0.000088 (0.000029)** 0.002	-0.0001 (0.0000272)*** 0.000	-0.000123 (0.0000281)*** 0.000	-0.000128 (0.0000293)*** 0.000	-0.000127 (0.0000304)*** 0.000
Political Risk	0.035 (0.008)*** 0.000	0.042 (0.007)*** 0.000	0.045 (0.007)*** 0.000	0.044 (0.007)*** 0.000	0.044 (0.008)*** 0.000
Pseudo R <sup>2</sup>	0.0665	0.0685	0.0675	0.0607	0.0588
Wald Test (linear and non-linear) on beta of FL	0.0028**	0.0007**	0.0003**	0.0003**	0.0002**

**Appendix Table A5: Regression results using ordered probit and different FLs**

RG	FL	AGGFL2	AGGFL3	AGGFL4	AGGFL5
Financial Liberalization	0.092 (0.031)** 0.003	0.047 (0.016)** 0.003	0.0309 (0.011)** 0.005	0.022 (0.008)** 0.010	0.0169 (0.007)** 0.015
GDP per capita	-0.000088 (0.000029)** 0.002	-0.0000872 (0.0000287)** 0.002	-0.0000867 (0.0000286)** 0.002	-0.000086 (0.0000286)** 0.003	-0.0000859 (0.0000286)** 0.003
Political Risk	0.035 (0.008)*** 0.000	0.035 (0.008)*** 0.000	0.035 (0.008)*** 0.000	0.036 (0.008)*** 0.000	0.036 (0.008)*** 0.000
Pseudo R <sup>2</sup>	0.0665	0.0662	0.0652	0.0633	0.0625

**Appendix Table A6: Regressions results using ordered probit and financial liberalization lags**

RG	Ordered Probit					
Financial Liberalization (FL)	0.092 (0.031)** 0.003	0.078 (0.058) 0.175	0.078 (0.058) 0.175	0.080 (0.058) 0.168	0.080 (0.058) 0.168	0.080 (0.058) 0.166
FL, lagged by 1 period		0.016 (0.057) 0.783	0.017 (0.076) 0.827	0.015 (0.076) 0.846	0.014 (0.076) 0.854	0.014 (0.076) 0.849
FL, lagged by 2 period			-0.000763 (0.0559) 0.989	0.039 (0.073) 0.591	0.040 (0.073) 0.578	0.041 (0.073) 0.577
FL, lagged by 3 period				-0.047 (0.055) 0.391	-0.070 (0.071) 0.320	-0.071 (0.071) 0.314
FL, lagged by 4 period					0.028 (0.053) 0.600	0.044 (0.070) 0.525
FL, lagged by 5 period						-0.019 (0.054) 0.715
GDP per capita	-0.000088 (0.000029)** 0.002	-0.0000878 (0.0000287)** 0.002	-0.0000878 (0.0000287)** 0.002	-0.0000876 (0.0000287)** 0.002	-0.0000881 (0.0000287)** 0.002	-0.000088 (0.0000287)** 0.002

Political Risk	0.035 (0.008)*** 0.000	0.035 (0.008)*** 0.000	0.035 (0.008)*** 0.000	0.036 (0.008)*** 0.000	0.035 (0.008)*** 0.000	0.036 (0.008)*** 0.000
Pseudo R <sup>2</sup>	0.0665	0.0666	0.0666	0.0676	0.0679	0.0681
Wald Test (linear and non-linear) on betas of FL	0.0028**	0.0111*	0.0293*	0.0454*	0.0756	0.1199

**Appendix Table A7: Regression results using different models and AGGRG5**

AGGRG5	Ordered Probit	Ordered Logit	Poisson	Negative Binomial
Constant			-0.233 (0.194) 0.229	-0.255 (0.252) 0.313
Financial Liberalization	0.109 (0.030)*** 0.000	0.190 (0.052)*** 0.000	0.066 (0.014)*** 0.000	0.073 (0.020)*** 0.000
GDP per capita	-0.000127 (0.0000304)*** 0.000	-0.000194 (0.0000527)*** 0.000	-0.0000876 (0.000015)*** 0.000	-0.0000827 (0.0000191)*** 0.000
Political Risk	0.044 (0.008)*** 0.000	0.074 (0.013)*** 0.000	0.029 (0.004)*** 0.000	0.029 (0.005)*** 0.000
Pseudo R <sup>2</sup>	0.0588	0.0602	0.1024	0.0548
Wald Test (linear and non-linear) on beta of FL	0.0002***	0.0003***	0.0000***	0.0002***

**Appendix Table A8: Regression results using different models and AGGFL5**

Regulatory Governance (RG)	Ordered Probit	Ordered Logit	Poisson	Negative Binomial
Constant			-2.447 (0.456)*** 0.000	-2.447 (0.456)** 0.000
Financial Liberalization AGGFL5	0.169 (0.007)** 0.015	0.026 (0.012)** 0.027	0.016 (0.007)** 0.017	0.016 (0.007)** 0.017
GDP per capita	-0.0000859 (0.0000286)** 0.003	-0.000136 (0.0000475)** 0.004	-0.0000943 (0.0000304)** 0.002	-0.0000943 (0.0000304)** 0.002
Political Risk	0.036 (0.008)*** 0.000	0.066 (0.014)*** 0.000	0.037 (0.009)*** 0.000	0.037 (0.008)*** 0.000
Pseudo R <sup>2</sup>	0.0625	0.0661	0.0620	0.0580