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Informational Quality of Financial Systems and Economic Development: An Indicators Approach for East Asia

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Informational Quality of Financial Systems and Economic Development:

An Indicators Approach for East Asia

James H. Chan-Lee and Sanghoon Ahn

June 2001

In this groundbreaking study, over 50 countries, including emerging market economies (EMEs) and OECD, are examined for the informational quality of their financial systems using nearly 30 microeconomic and institutional indicators.

By assessing recent institutional and structural reforms against a statistical benchmark, the findings suggest disproportionate gains occur in per capita GDP with improvements in the social infrastructure. The authors also find that better enforcement of law is more important than the origins of legal systems.

This new indicator could be used to make more transparent and insightful strategic diagnoses of EMEs' financial systems and to assess and compare systemic risks.



**ADB Institute
Working Paper Series
No. 20**

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**Informational Quality of Financial Systems
and Economic Development:
An Indicators Approach for East Asia**

**James H. Chan-Lee
and
Sanghoon Ahn**

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PREFACE

The ADB Institute aims to explore the most appropriate development paradigms for Asia composed of well-balanced combinations of the roles of markets, institutions, and governments in the post-crisis period.

Under this broad research project on development paradigms, the ADB Institute Working Paper Series will contribute to disseminating works-in-progress as a building block of the project and will invite comments and questions.

I trust that this series will provoke constructive discussions among policymakers as well as researchers about where Asian economies should go from the last crisis and current recovery.

Masaru Yoshitomi
Dean
ADB Institute

ABSTRACT

The “informational quality of financial systems” (IQFS) and its relation to economic development is assessed for 34 emerging market economies (EMEs) and 21 OECD countries following Asia’s 1997-1998 crisis. Institutional economics suggests that the heart of any financial system is its institutional-informational infrastructure and long-term contracting capabilities. Twenty-seven microeconomic and institutional indicators are used to proxy IQFS for 1995-1998 (with preliminary estimates for 1985).

The issue of whether common law systems are inherently superior to civil code legal systems in encouraging financial and economic development is addressed. Our measure of IQFS suggests that better enforcement rather than legal origins are critical. Moreover, countries with Germanic/Scandinavian legal systems have better capital markets and higher per capita GDP than the common law countries in our sample.

Our new IQFS indicator permits transparent and objective strategic diagnoses of EME’s financial systems over time, status relative to comparators, and insights into whether actual financial paradigms are “appropriate controlling” for per capita GDP. Recent institutional and structural reforms can also be compared vis-à-vis a “statistical benchmark” to judge systemic risk.

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Informational Quality of Financial Systems and Economic Development: An Indicators Approach for East Asia

James H. Chan-Lee and Sanghoon Ahn[†]

I. Introduction

The financial firestorm that swept through Asia in 1997-1998 came as a near-death experience following three decades of uninterrupted economic growth. Prior to the crisis, it had been recognized that East Asia's institutions or social infrastructure were poor or mediocre; but it was difficult to assess the consequences of this against a backdrop of strong growth. A few analysts argued that Asia's authoritarian institutions were inimical to the ethos of social-economic pluralism that characterizes "first world" economies, and that the region's mediocre total factor productivity (TFP) performance masked deep structural fault lines (e.g., Lingle 1998, Krugman 1998). However, the majority of "informed analysts" complacently assumed that East Asia's past track record would breed future success and that better institutions would evolve with higher levels of wealth.

The unprecedented severity of the 1997 crisis has necessitated a radical reassessment of these views. Even so, many puzzles remain: how did East Asia achieve such remarkable economic growth prior to 1997-1998, despite poor institutions? Why did the 1997 events trigger such a disproportionate financial market reaction? What priority needs to be attached to upgrading specific institutions and in what sequence? What are the costs and benefits of structural and financial reform? What progress has been made in structural reform since 1997 and is it adequate to forestall another crisis? This paper presents a policy matrix, showing where individual countries stand relative to a group of comparators over time and *vis-à-vis* a statistical benchmark, providing salient quantitative indicators relevant to these issues.

The heart of any financial system is its institutional-informational infrastructure...

Cardinal estimates of the "informational quality" of financial systems for 34 emerging market economies (EMEs) and 21 advanced Organisation for Economic Co-operation and Development (OECD) economies are presented in Table 1, covering some 95% of world gross domestic product (GDP). Its methodology is inspired by the seminal studies on the role of institutions and legal systems in economic development by Olson

[†] This study has benefited from the invaluable insights and suggestions of the Dean of the Asian Development Bank (ADB) Institute, Dr. Masaru Yoshitomi. The views, assessments, evaluations and rankings expressed here are the authors' and do not necessarily reflect those of the ADB Institute, Institut d'études Politiques de Paris, ESSEC or OECD. Data underlying the policy matrix are available on the ADB Institute web site: www.adbi.org

(1965), North (1991), Williamson (2000) and La Porta et al. (1998). It thus departs radically from those of international credit rating agencies, as it appeals to the “new institutional economics” and information theory, rather than macroeconomic phenomena.¹ Informational quality is defined here as the capacity of the institutional-governance environment (and the incentive structures it engenders) to generate the transparent information base on which financial systems and economic development depend.

...27 microeconomic-institutional indicators in a hierarchically ordered policy matrix proxy this concept

Twenty-seven microeconomic indicators are used to proxy informational quality (Table 2). A causal hierarchy orders these inputs. Indicators proxying the “institutional-governance environment” are assigned the highest order, implying greater constraints on lower levels of behaviour: viz. in descending order “the regulatory environment-structural strength of banks” and the “functional quality of capital markets”. In this context, the role of institutions is to transform heterogeneous data into sufficiently standardized forms that economic uncertainty can be converted into diversified-marketable risk. Indicators, proxying the core features of financial systems, are grouped under three categories and collated² in the form of indices ranging from 0 to 10. These estimates are circa 1995-1998, although preliminary estimates are also presented for 1985³. Our index of “global informational quality” is thus a weighted average, in which the first two categories receive twice the weight of the capital market. As regards the capital market, the volatile share market is assigned a weight consistent with empirical estimates of small wealth effects in US private consumption functions. By contrast, the long-term private bond market is assigned twice its weight to reflect its greater informational content. (Background data underlying the policy matrices are available from the authors on request or on www.adbi.org)

This paper is in five parts. Part II reviews the relation between economic development and financial systems, and proposes a hypothesis of how East Asia enjoyed strong economic growth for decades, despite weak institutions and financial systems. Part III sketches out the role of institutions and how they affect economic behaviour. The often-claimed causal role of the origins of legal systems in economic development is assessed, as well as earlier attempts to integrate financial markets into growth theory. Conceptual and measurement issues related to the construction of a global index of “quality” are briefly summarized. Part IV presents a statistical “benchmark” of informational quality relative to differing stages of economic development, along with estimates of the potential benefits of improving social infrastructure. Part V presents a summary and conclusions.

¹ A microeconomic approach does not exclude macroeconomic phenomena. Our estimates of “quality” are best viewed as normalized at trend capacity utilization rates. Good quality informational institutions should boost trend TFP by raising both the efficiency and level of investment (see below).

² Some elements of judgement were inevitable when published data contradicted common sense or were not available. Such cases are indicated in the text and/or in the notes attached to the policy matrix.

³ The estimates for 1985 use a number of indicators that began only in the early 1980s or were interpolated when earlier data were not available.

Table 1:
Global Indicators of Informational Quality

weighed index

<i>Economy</i>	<i>PPP Per capita GDP 1998 (\$)</i>	<i>1985</i>	<i>1995</i>	<i>1998</i>	<i>Quality Ranking</i>
Argentina	10,639	4.1	4.1	4.6	30
Australia	21,949	7.7	7.7	7.6	5
Austria	23,077	6.1	5.8	5.1	26
Belgium	23,242	6.7	6.0	5.1	25
Brazil	6,536	3.7	3.6	3.1	39
Canada	23,761	8.3	8.1	7.7	4
Chile	14,733	5.3	5.8	5.6	22
China, People's Rep. of	3,283	1.2	1.2	2.4	47
Colombia	6,366	3.1	3.3	3.2	38
Czech Republic	10,800	3.1	3.2	3.9	34
Denmark	25,514	8.0	7.6	6.9	8
Ecuador	4,700	1.8	1.6	1.1	54
Egypt	3,080	1.2	1.2	2.0	51
Finland	20,488	7.1	6.7	6.5	14
France	22,186	7.4	7.0	6.4	15
Germany	21,610	7.3	7.0	6.6	11
Greece	13,912	3.3	3.2	3.8	35
Hong Kong, China	21,000	7.5	7.3	6.9	7
Hungary	7,300	3.2	3.3	4.0	33
India	1,542	2.4	2.5	3.0	41
Indonesia	2,873	0.8	1.0	1.7	53
Ireland	20,634	5.8	5.6	5.8	18
Israel	17,667	5.2	5.0	4.7	28
Italy	21,265	5.3	5.2	5.2	24
Japan	22,913	7.5	6.9	6.7	9
Jordan	3,350	2.7	2.6	3.0	42
Kenya	1,160	2.5	2.4	2.2	49
Korea	12,587	3.9	4.4	5.7	20
Malaysia	6,990	6.0	6.3	5.8	19
Mexico	8,823	2.3	2.7	3.1	40
Netherlands	22,142	7.0	6.8	6.5	13
New Zealand	17,846	6.6	6.3	6.0	17
Nigeria	830	1.9	1.6	2.1	50
Norway	26,771	6.2	5.7	5.6	21
Pakistan	1,950	1.9	1.9	2.7	45
Peru	3,300	3.4	3.5	4.5	31
Philippines	3,540	3.0	3.1	4.8	27
Poland	6,769	2.5	2.8	3.4	36
Portugal	14,562	4.0	4.2	4.6	29
Russia	4,116	0.0	0.0	0.0	55

Table 1 continued: Global Indicators of Informational Quality

<i>Economy</i>	<i>PPP Per capita GDP 1998 (\$)</i>	<i>1985</i>	<i>1995</i>	<i>1998</i>	<i>Ranking</i>
Saudi Arabia	10,540	2.2	2.2	2.9	44
Singapore	29,333	7.4	7.4	7.3	6
South Africa	7,244	5.4	5.1	5.6	23
Spain	15,990	5.5	5.5	6.2	16
Sri Lanka	2,220	2.2	2.1	2.6	46
Sweden	20,439	7.4	7.0	6.6	12
Switzerland	25,902	8.8	8.9	8.3	3
Taipei, China	13,310	5.4	6.4	6.7	10
Thailand	6,639	3.4	3.4	4.2	32
Turkey	6,463	1.8	2.2	1.8	52
United Kingdom	20,678	9.5	9.6	9.4	1
United States	29,422	9.7	9.4	9.1	2
Uruguay	9,110	2.4	2.4	2.9	43
Venezuela	8,190	3.5	3.4	3.2	37
Zimbabwe	2,240	2.4	2.4	2.3	48
Median	108,000	4.0	4.2	4.7	
English origin	129,503	5.3	5.2	5.3	24.5
French/Spanish	105,350	3.7	3.7	3.9	34.2
German	171,874	5.6	5.7	5.9	19.4
Scandinavian	233,030	7.2	6.7	6.4	13.8

Rankings not endorsed by ADB/I

II. The Relation between Economic Development and Financial Systems

II.1 What went right and what went wrong in East Asia

Post-war economic growth in East Asia has long fascinated growth theorists because such outstanding results were obtained following quite different scripts⁴. The Republic of Korea (henceforth, Korea) transformed itself into a modern economy in just two generations through brisk export-led industrialization, spear-headed by large industrial conglomerates (the *chaebols*). A key instrument of government industrial policy was directed lending of scarce credit to *chaebol*-run heavy industries through “socialized” financial institutions. Notwithstanding the burden on consumers from an under-developed and costly service sector, weak domestic competition and distorted industrial structures, this “statist model” (personified in the concept of “Korea Inc”.) delivered remarkable results for more than 30 years. A unique feature was the development of a strong stakeholders’ mentality and a social consensus based on a relatively equitable

⁴ Paradoxically, unending growth gave rise to type II identification errors concerning the role of institutions in Asia. This identification problem may now be resolved following the 1997 crisis or with a larger sample of countries (see below).

income distribution. Until the mid-1990s, many analysts and businesspersons were convinced that if other Asian EMEs (e.g., People's Republic of China [PRC], Indonesia, Malaysia, Philippines and Thailand) emulated this "consensual" strategy, Asia would be the focal point of world growth in the third millennium. By contrast, Hong Kong, China eschewed this "statist approach", but achieved equally impressive results emphasizing free market principles and a good banking system.

II.1.1 What went right in East Asia: how relevant was catch-up as an explanation?

Such impressive economic results achieved through widely differing strategies prompted a lively debate over the relative merits of socialized vs. free market growth strategies (World Bank 1993), with some politicians even advancing the bizarre "theory" that rapid growth in Asia was due to unique "Asian values". Even so, it is indisputable that East Asia's remarkable post-war growth record was based on impressive fundamentals, notably remarkably high savings-investment rates, conservative fiscal policies, small government, political stability, disciplined (and relatively young, well-trained) work forces and a strong net export-bias in an era of rapid world trade liberalization. This environment also proved conducive for the transfer of technology (resulting in strong capital inflows). In short, East Asia's "golden era" appears to fit neatly into a neoclassical "textbook explanation" of growth based on export-led takeoff and factor price equalization. According to this paradigm, growth is sparked initially by technological "catch-up" in basic labour-intensive industries, followed by progressive penetration into more advanced industries, as human capital and technical capabilities are upgraded through learning-by-doing. That said, it is still difficult to disentangle the role of government-sponsored industrial policies (such as Korea Inc.), as there is no obvious counter-factual, except peer comparison.

In fact, empirical evidence supporting "convergence or catch-up models"⁵ is quite mixed, albeit with strong evidence for post-war East Asia (Temple 1999). By contrast, many former communist countries and a shocking number of EMEs in Africa and the Middle East that satisfy the necessary conditions for "takeoff" have failed to do so. Thus, for many policy analysts, convergence or catch-up models reflect *ad hoc* measurement without theory, as they provide no insight into such fundamental issues as: what factors explain such large and persisting differences in per capita income between countries (irrespective of resource endowment) and economic performance over time⁶? Moreover, these models provide no insight into the reasons for Japan's prolonged economic slump. In short, Japan's continuing dismal economic performance and the Asian crisis have rekindled long-held suspicions that other factors are essential in the transition towards mature economy status in EMEs (and maintaining economic dynamism in developed countries) – notably, the institutional-governance environment, and incentives based on property rights and individual freedom (Lingle 1998).

Improving the institutional-governance environment is an important goal in Asia's crisis economies. But, a puzzling question is: if they are so important, how did Asia

⁵ Strictly speaking, the convergence model of "catch-up" is that latecomers, once they attain the convergence path, should experience the fastest rates of economic growth.

⁶ The cross-country growth equations of Barro (1991) and Mankiw et al. (1992) are typical of earlier approaches.

achieve such spectacular growth, despite poor institutions and incentive structures? Our hypothesis is that until the late 1980s, slow financial deregulation and capital controls shielded weak financial systems, and given the pervasive optimism among “informed investors”, rapid economic growth became self-fulfilling. In sum, when “animal spirits and macroeconomic conditions” are favourable, once a critical threshold of social infrastructure is attained, per capita GDP may rise to much higher *levels* before meeting new constraints⁷ (see Figure 1)⁸. Moreover, East Asia’s remarkable fundamentals absolved the cardinal sin of poor bank lending practices (and mediocre institutions) via high nominal growth.

II.1.2 What went wrong?

Against such a rosy background, why did things go wrong so quickly in East Asia following the devaluation of the Thai baht in July 1997? There is no consensus on this issue. Paradoxically, the structural fault lines above were apparent before the crisis, but largely ignored. Thus, notwithstanding decades of booming investment and economic growth, East Asia’s TFP performance, and especially rates of return on capital, were known to be mediocre (Raj et al. 1996, OECD 1999a). However, these were a harbinger of future problems as they underscored the critical fact that the allocation of scarce capital by “administrative guidance” had systematically destroyed shareholder value since the late 1980s (Pomerleano 1998).

II.1.3 Deregulation and capital account liberalization were badly executed

As elsewhere, liberalization of the region’s approach to picking winners and allocating scarce capital became a part of the policy agenda in the mid-1980s (Zahid 1995)⁹. However, progress was slow. Crucially, the monetary authorities failed to draw the key policy lessons from costly banking crises in Latin America and elsewhere: that upgrading prudential supervision standards and their enforcement are pre-requisites to successful financial market liberalization. Moreover, the thorny problem of disengaging government from business proved difficult, despite wide-scale privatization of the banking system. Hence, rapid financial market deregulation was undertaken starting in the late 1980s in the absence of an adequate regulatory framework¹⁰. Worse,

⁷ These critical thresholds are difficult to identify empirically, as they will depend *inter alia* on the external environment, macroeconomic performance and especially “reputation”. The latter concept is particularly elusive, as they represent virtual regime shifts.

⁸ Countries are grouped according to specific financial systems characteristics for expositional purposes in Figure 1. The bottom two categories reflect specific cut-off levels for the role of state-dominated banking and the emergence of commercial banking. *Levels* of informational quality corresponding to these categories vary between 0-2 and 3-5, but appear sufficient to underpin *per capita GDP levels* ranging from \$400 to \$4,000 and \$4,500 to \$15,000, respectively. However, countries appear more vulnerable to financial crises with lower levels of informational quality, in the absence of good macroeconomic policies and/or capital controls.

⁹ This decision reflected *inter alia* the inability of the region’s financial institutions to offer the sophisticated services needed by East Asian firms to meet world-class international competition, and hence the challenges of globalization and rapid structural and technical change.

¹⁰ The authorities failed to provide the necessary resources to improve offsite and onsite supervisory enforcement in response to the rapid growth of non-banks following deregulation. Indeed, a common international feature following financial market deregulation is a period of rapid credit growth (in the

the regulatory authorities were complacent or ignorant of how capital account liberalization had undermined systemic financial stability, owing to lax enforcement and weak reporting standards of short-term foreign debt exposure and maturity mismatch (see below).

With the benefit of hindsight, the origins of East Asia's financial crisis lay in the fragility of its institutional structures and poorly executed financial market deregulation and premature capital account liberalization starting in the late 1980s. These weaknesses were manifested in:

- weak corporate governance and disclosure rules;
- poor prudential regulatory control over rapidly expanding near banks and/or newly franchised banks;
- weak enforcement of the “rules of the game”, exacerbated by supervisory forbearance, government intervention and inadequate bankruptcy laws;¹¹
- poor financial transparency (opaque accounting and auditing standards);
- liberalization of short-term capital flows before the politically more sensitive long-end of the capital account (e.g., Korea and Thailand); and
- implicit government guarantees, as no financial institution had ever been allowed to default on its international debt.

II.1.4 Encouraging excessive gearing, currency and maturity mismatches

Considering the weaknesses above, the attractions of much lower-cost unhedged short-term US dollar debt financing proved irresistible – especially given the low perceived risk in quasi-pegged exchange rates for more than 10-20 years. It was thus hardly surprising that Indonesia, Korea, Malaysia, Philippines and Thailand built up large foreign currency and maturity mismatches, as international banks extended massive credit lines to East Asian banks until the eve of the crisis¹². This combination of highly leveraged firms and banks resulted in dangerous levels of systemic risk, in the event of capital flight sparked by currency devaluation and/or a steep rise in interest rates¹³.

Asian crisis economies this was almost three times that of GDP), followed by financial crisis, in the absence of upgraded prudential supervision (Demirguc-Kunt et al. 1997a and 1998, and Bisignano 1999).

¹¹ Post-mortem examinations of what went wrong found cases of fraud, as well as glaring examples of prudential forbearance, in the crisis economies with respect to related lending and excessive single borrower exposure typical of family-dominated business and governance systems. Banking systems were also more highly geared than had been thought, owing to poor reporting of short-term foreign exposure and inadequate classification and provisioning for problem loans.

¹² From 1994 to 1996, private capital flows into Indonesia, Korea, Malaysia, Philippines and Thailand rose from \$40.5 billion to \$103.2 billion and plummeted to -\$1.1 billion in 1997. From peak to trough, this swing in proportion to GDP was 16.7% in Thailand (1995-1998), 13.4% in Indonesia (1995-1998) and around 10% in Korea (1997-1998) (see Yoshitomi and Ohno 1999).

¹³ This phenomenon has been called “original sin” by some authors and occurs when countries with underdeveloped long-term debt markets take on excessive lower-cost short-term foreign debt, because they cannot borrow long term in their own currencies domestically or internationally. This situation is exacerbated when interest rate differentials favour unhedged short-term foreign borrowing to lend long domestically, especially if agents think there is an implicit exchange rate guarantee. In Thailand, these spreads ran at between 5 and 8 percentage points for a decade. Systemic risk is high because currency and maturity mismatches cannot be effectively hedged. Devaluation can spark a currency and a banking crisis, because debt/GDP ratios and debt service escalate, thereby starting an unstable spiral (see McKinnon 2000).

These systemic features appear to explain why the abrupt reversal of international bank lending to East Asia in late-1997 (and the subsequent International Monetary Fund [IMF] high interest rate policies) had such devastating effects.

In retrospect, the main lesson from the 1997-1998 débâcle was that East Asia's institutions and governance structures failed to adapt to the radically less favourable external environment of the 1990s, rather than that international banks are quintessential "fair weather friends". Moreover, with the benefit of hindsight, the expectations of "informed investors" proved to be quite vulnerable to large discrete shocks¹⁴. Thus, 1997-1998 probably marked a watershed in the confidence of "informed investors" in East Asia's infallible ability to achieve the sustained economic growth needed to justify high levels of leveraging over the medium term. In the event, Asia's institutions were found badly wanting, when they were most needed to negotiate the hazards of rapid financial market and capital account liberalization. A change in attitudes is now spurring rehabilitation of the region's devastated banking and inadequate prudential regulatory systems. However, the challenge is to find a paradigm that will harness the gains of globalization in an era of heightened capital outflows (Yoshitomo and Ohno 1999). But, until such a paradigm emerges, a "better practice model" (based initially on stronger banks) is needed to offset the region's opaque informational quality and vulnerability to shocks.

II.2 The role of institutions in economic growth

The past 20 years have seen a remarkable resurgence of interest in institutional economics, reflecting the sterility of growth theory in providing operational insights into policy issues such as how to achieve higher sustainable economic growth and to reduce poverty in EMEs. At the same time, the "new institutional economics" has received a fillip from quantitative measures of complex social institutions (mostly based on survey data from multinational firms and banks to gauge international risk). Many of these indicators date from only the mid-1980s and have yet to establish a track record for accuracy. Nonetheless, they try to provide the analyst with quantitative measures of the "quality" of governance, economic freedom, property rights, rule of law, legal rights, efficiency of the judicial system, government efficiency, corruption, freedom of the press, accountancy standards, etc., for a large sample of countries (see Aron 2000). These data sources have also encouraged empirical testing of the microeconomic relations that underpin incentive structures and economic development. The role of

¹⁴ Given opaque transparency and large fixed costs in obtaining information, rational international investors appeared to have used credit-rationing models based on portfolio diversification principles. This may have led to credit rationing by regional rather than country-specific risk considerations. The problem was that with large *regional* discrete shocks, "informed investor" behaviour may shift to anticipating how they think other "informed investors" will react, rather than assessing opaque domestic economic fundamentals. This phenomenon may well explain why myopic investors flooded the Asian crisis economies with capital until the eve of the crisis and then exited in droves once the illusion of never-ending rapid economic growth was shattered. Stiglitz (2000) shows how multiple equilibria and non-linearities can develop with imperfect information owing to nonconvexity conditions. Non-linearities or reputation effects might explain how East Asia achieved rapid growth despite poor institutions or how Japan closed the per capita GDP gap *vis-à-vis* the US for 30 years, but subsequently stalled in the 1990s. For a formal model of this type, see Calvo et al. (2000).

institutions is discussed below, followed by a description of the level of social theory at which they operate. Transmission mechanisms are also briefly discussed.

II.2.1 What are institutions and their role?

The Nobel laureate Douglas C. North (1991) provides an excellent definition of institutions, which ones we are interested in and why:

“Institutions are the humanly devised constraints that structure political, economic and social interaction. They consist of both informal constraints (sanctions, taboos, customs, traditions, and codes of conduct), and formal rules (constitutions, laws, property rights). Throughout history, institutions have been devised by human beings to create order and reduce uncertainty in exchange. Together with the standard constraints of economics they define the choice set and therefore determine the transaction and production costs and hence the profitability and feasibility of engaging in economic activity. They evolve incrementally, connecting the past with the present and the future; history in consequence is largely a story of institutional evolution in which the historical performance of economies can only be understood as a part of a sequential story. Institutions provide the incentive structure of an economy; as that structure evolves, it shapes the direction of economic change towards growth, stagnation, or decline”.

This paper is in the same spirit as North’s definition and, as with most empirical studies, it deals with measurable behaviour, and not with informal constraints that defy economic analysis (see Schema 1).

II.2.2 Establishing an institutional hierarchy

As Williamson (2000) readily admits, “economists are quite ignorant about institutions”. For example, North states that he has no answer to the query: “What is it about informal constraints that gives them such a pervasive influence upon the long-run character of economies”. As noted above, social parameters are assumed to be given by almost all institutional economists because they take from 100 to 1,000 years to change¹⁵ (Schema 1, row 1 and column 2). The “new institutional economics” thus largely relates to Levels II and III of social behaviour that determine the rules and the play of the game over an operational time period of 10 to 100 years. However, given the diversity of social-political-economic indicators falling into these two broad categories, it is difficult to differentiate among competing institutional theories because they tend to be collinear (Aron 2000).

An insightful way of putting socio-economic indicators into perspective is proposed by Williamson’s categorization into four functional operating levels, using a policy matrix (these include: social theory, the economics of property rights, transactions costs economics, and neo-classical/agency theory). A key feature of this ordering is that the higher the level, the stronger the constraints imposed on lower level behaviour, even though there are feedbacks. (In short, the hierarchy is based on causality.) Moreover, higher levels operate under a much longer time frame than lower

¹⁵ Interestingly, the fact that social factors are resistant to change is common knowledge among anthropologists, historians and students of classical philosophy. Eliade (1976) provides a philosophical explanation of how myths, rituals and religion profoundly characterize different civilizations.

levels¹⁶. Thus, higher level reforms have non-linear paybacks in terms of causal impact, but are much slower in yielding results. And, as Aron notes, the higher the rule in the hierarchy, the more costly it is to alter or reform – explaining why institutional reform is so politically difficult to deliver.

Schema 1: Institutional relations

<i>Level</i>	<i>Frequency</i>	<i>Purpose</i>
I. Embeddedness: Informal institutions, customs, traditions, norms, religion	100 to 1,000 years	Spontaneous
II. Institutional environment: formal rules of the game – especially property (polity, judiciary, bureaucracy)	10 to 100 years	Get the institutional environment right 1 st order economizing
III. Governance: Play of the game – especially contracts (aligning governance structures with transactions)	1 to 10 years	Get the governance structures right 2 nd order economizing
IV. Resource allocation and employment (prices and quantities; incentive alignment)	Continuous	Get the marginal conditions right 3 rd order economizing

Level II: economics of property rights/positive political theory
 Level III: transaction cost economics
 Level IV: neo-classical economics/agency theory
 (Source: Williamson 2000, p. 597.)

¹⁶ Reform of institutional and governance structures will take longer than those of operational rules at the grass roots. These considerations are important in designing effective reform programmes, because the nature and time horizon of instruments must be consistent with the policy goals, as causality flows from the top down.

II.2.3 Transmission mechanisms: How do institutions affect economic development?

A growing literature has developed attempting to determine the extent to which the quality of public and private economic institutions affects economic growth. Much of this analysis focuses on the structure of institutions, governance (or the quality of social infrastructure) using cross-country regressions, owing to the paucity of macroeconomic time series and institutional data for many EMEs¹⁷. Although suggestive, these empirical results are not robust, reflecting measurement error and the difficulty of isolating “normalized observations” for EMEs faced with recurrent political and economic crises. Moreover, it is not always clear what transmission mechanisms are being appealed to in specifying the role of institutions in economic growth (Aron 2000). Hence, some studies do not specify whether the quality of institutions affects the level of investment through higher savings and investment (via lower transactions and production costs) or overall efficiency gains (through more efficient markets and resource allocation), or both. How one views this transmission mechanism could influence the choice between structural growth equations (in the tradition of Solow-type models) or reduced form models of investment to capture feedback effects¹⁸. The methodological implications of recent key studies are sketched below.

II.2.4 Do legal institutions promote financial and economic development?

A seminal study by La Porta et al. (1998) postulates a fascinating interface between legal systems, social institutions and economic development. It isolates core aspects of legal systems, including the rule of law, the quality of the judiciary, government diversion and corruption, as well as shareholder and creditor rights and accounting transparency, etc., and assigns cardinal scores to these criteria for 49 countries (i.e., Levels II and III). According to this influential study, a critical characteristic of legal systems is that they are dominated by cultural origins and history (Level I), although enforcement is positively correlated with per capita income levels. Moreover, La Porta et al. suggest that causality runs dominantly from legal systems to “good government” and hence economic development, and this has become a prominent theme of

¹⁷ Aron provides a convenient list of the large number of measures that have been used to measure social capital, social characteristics, political characteristics and political instability. A correlation matrix against real per capita GDP from 1980-1989 indicates that institutional quality and social capital variables, followed by social characteristics, have the highest correlations. Correlation, of course, does not imply causality.

¹⁸ For a survey of the advantages and disadvantages of structural growth equations as opposed to reduced form approaches, see Aron 2000. As Solow-type growth equations include current investment as a determinant of growth, when the variable that is thought to measure the quality of investment is entered, its parameter can be interpreted as having a direct effect on growth by improving the efficiency of investment. Any other effects that the institutional variable has on the volume of investment are indirect. A separate investment equation would thus be needed to ascertain the direct effect of institutions on the volume of investment, probably requiring a reduced-form approach. If a reduced-form model is used, the endogenous dependent variable is expressed only in terms of exogenous variables and parameters. For example, endogenous investment on the right-hand side of the equation is replaced by a set of variables, which fully determine investment (including the quality of institutions). While this might be theoretically more appealing, the main disadvantage of this approach is that one loses the ability to distinguish between the different channels of transmission and how they affect growth through second moment effects.

proponents of the central role of the “rule of law” in EMEs (see, for example, La Porta et al. 1999 and Mahoney 1999). Moreover, given the libertarian virtues of common law countries, these are expected to have better legal systems than those with civil code systems – and logically, better financial systems and higher incomes, as well – given the competitive advantages of better social infrastructure.

Without denying the central role of legal systems, Rajan and Zingales (henceforth, R&Z) (1999) contest the hypothesis that the causality between the origins of legal systems and economic-financial development is rigid and unidirectional. In fact, they point out that those financial markets in France, Germany, the UK and US (as a proportion of GDP) reached pinnacles in 1913 and their relative sizes were quite similar (apart from that of the UK, which was three times larger, owing to its dominant role in world finance) despite marked differences in legal systems¹⁹. Going beyond the study by La Porta et al., R&Z argue that economic history shows that institutional impediments to financial development are usually political rather than related to legal origins, and that the causality between institutions and economic growth can run in both directions. Starting from the industrial revolution, they argue, financial development has been subject to long cycles and could vary sharply over time according to historical and political circumstances. Moreover, history provides examples of the supply of institutions and legal systems adapting to strong perceived demand²⁰.

In summary, the main question for policy analysts is, given the benefits of efficient, well developed legal and financial systems, why have some Asian countries adopted the necessary institutions to realize the advantages of good social infrastructure, but not others? According to R&Z, the essential reason is that reform redistributes economic and political control. Thus, while legal reform, greater competition and capital market deregulation may be necessary for rehabilitating Asia’s moribund financial systems, effective implementation might require initiatives to overcome entrenched interests, such as setting up a minimum social safety net and broader based ownership of capital (for a political economy perspective of reform, see Kroszner 1998).

Last, the results of our index of informational quality imply that the distinction of La Porta et al. between common law versus civil code legal systems is too stark. In practice, many EMEs with civil code systems have adopted some of the best features of common law (and vice versa; see Woo-Cumings 2001). Moreover, enforcement appears to be more important than legal origins *per se* in determining the institutional

¹⁹ This is consistent with R&Z’s argument that while civil code systems are less adaptable to innovation, nothing prevents them from imitating good features of common law systems. Hence, while it took more than 150 years for English common law to work out a satisfactory legal structure for limited corporate liability, it took less than a decade for the French civil code to copy it. (A similar process is proceeding with financial systems, with France, Germany and Japan adapting a hybrid form of the Anglo-Saxon model. But whether this hybrid model can be cloned on to EMEs in the absence of an adequate social infrastructure is an open question [see Part III].)

²⁰ One example cited by R&Z is the 19th century’s need to mobilize the vast financing requirements of the US railroads, which led to the development of specialized financial institutions to intermediate between US legal systems (which differ by states) and European investors (in the wake of massive fraud and a wave of bankruptcies). These institutions ultimately became investment banks such as J.P. Morgan. A fascinating analogy is what will be the equivalent to J.P. Morgan given the enormous pressures on Asia to adapt and change. This question is hard to answer, although there is no doubt of the pressing need for East Asian EMEs to find a more adequate financial paradigm.

environment. Indeed, claims concerning the intrinsic superiority of common law versus civil code legal systems – and hence financial market and economic development – are contradicted by the experience of countries with Germanic/Scandinavian legal heritage. Hence, irrespective of legal origins, we suggest that the impact of legal systems needs to be assessed with greater nuance.

II.2.5 Institutions and economic growth: What has been done so far?

This paper explores the uncontroversial proposition that good institutional-governance structures are the bedrock of sound financial systems and hence economic growth. Until recently, empirical testing of this joint hypothesis has been limited by the difficulty of gauging the quality of institutions and financial systems. Most of the growing number of empirical studies has relied on international surveys of economic risk or other measures of political stability and social characteristics²¹. For example, Hall and Jones (H&J) (1999) present an intriguing study using survey measures of the quality of “social infrastructure” in a cross-country model to explain wide and persistent differences in per capita GDP levels – apart from resource endowment. Similarly, Knack and Andersen (1999) use a comparable database to assess the role of property rights and smaller governments on economic growth and poverty reduction. These studies indicate interesting avenues for future research. However, what specific set of legal structures should be focused on and how they interact with other institutions (and politics) to promote economic growth is an area of on-going research. Indeed, the difficulty in differentiating between hypotheses using competing “social indicators” explains in part the strange controversy concerning whether the “quality of growth” is more effective in reducing poverty in EMEs than output growth *per se*.

By comparison, studies of the relation between financial institutions and economic growth have been relatively limited. Many of these emphasize the central role of financial intermediation in raising savings and investment rates, rather than the role of institutions. This earlier orientation explains in part why relatively accessible variables such as private loans to GDP, stock market capitalization²² and market liquidity have been relied on (e.g., Levine and Zervos 1998). However, a major lacuna in this approach is its neglect of the weak informational infrastructure in EMEs. Moreover, the key roles of the private bond market²³ and the monitoring activities of

²¹ As with this study, many researchers have used the International Country Risk Guide (ICRG). Other sources include the *Euromoney* guide or *Institutional Investor*.

²² A major limitation of stock market capitalization data is the marked difference in liquidity between markets. Zhuang (1999) indicates that market turnover in East Asia is roughly half that of European markets and bid offer spreads are twice as large.

²³ The necessary conditions for establishing deep corporate bond markets are complex, but depend, importantly, on the quality of standardized information and long-term contracting capabilities. These are key because the risk of default must be spread over a large (although limited) number of “arms-length” risk-adverse bondholders. Given these requirements, the number of potential issuers in EMEs who meet such high credit standards is limited. Further, the development of corporate bond markets has in the past been stifled by overregulation, high transaction costs and protection of weak banks. For example, in Korea, maximum corporate maturities are rarely over three years. Before 1997, banks underwrote most corporate bonds and spreads in yields between creditors of different credit status were small (see OECD 1999b).

financial institutions²⁴ are neglected. In short, such first generation studies risk confusing *quantitative* advances in intermediation as *qualitative* evolution of financial systems²⁵. Last, policy advice based on such models has no operational value because they examine *effects rather than causes*.

Despite these limitations, the empirical estimates of Levine and Zervos (1998) (as well as R&Z's 1998 study on the financing needs of credit-constrained dynamic industries) give strong support to the catalytic role of financial systems in growth. Their results thus hold out the promise that integrating indicators of the "quality" of financial systems *together* with financial intermediation may be a promising area of research. An indicators approach may also shed light on such practical issues as:

- Where do individual EMEs stand relative to their peers (with similar institutional-governance systems and income levels) and thus what is the scope for adopting better practice techniques in the policy run?
- Which specific institutional-governance structures need to be improved (e.g., the rule of law, quality of the judicial system, creditor and shareholder rights, bankruptcy laws) and under what time frame?
- What aspects of the regulatory environment and financial system need top priority and in what sequence?

III. Conceptual and Measurement Issues

III.1 Measuring the quality of financial systems in EMEs

The methodological challenge is how to measure informational quality. The 27 indicators listed in Table 2 below have been assigned to separate categories of the institutional-financial nexus based on the hierarchical ordering suggested by Williamson's policy matrix (cf. Schema 1). The levels to which they correspond and their principal characteristics are described below:

- the institutional-governance environment (Level II and the top of III);
- the prudential regulatory environment and structural strength of the banking system (lower part of Level III); and
- the functional quality of capital markets (Level IV).

²⁴ Monitoring may be difficult given the legacy of government intervention and moral hazard. Thus, while the strength of banks' balance sheets reflects past government actions, its dimensions are impossible to pin down in the absence of crisis. It is striking that Standard and Poor's EMEs sovereign debt ratings treat all bank liabilities as contingent sovereign liabilities.

²⁵ A hypothesis to be tested is whether rapid financial intermediation was the positive factor for economic growth postulated by Levine (1998). With the benefit of hindsight, this may have been a time bomb, because the quality of lending was so poor. In Korea, following deregulation, the less regulated non-banks' share of total deposits rose from 37% to 68% from end-1980 to June 1995. Overly rapid intermediation in the Asian crisis economies may well have swamped the *quality* of their regulatory infrastructure. This shortcoming would not be captured in Levine's earlier methodology.

III.1.1 Scoring techniques

Our scoring technique is that when indicators are “qualitative in nature” (e.g., Level II: such as rule of law, efficiency of the judicial system, corruption or ownership concentration) the base data are scaled over a range between 0 and 10. By contrast, when they are policy-specific instruments such as the Bank for International Settlements (BIS) capital adequacy ratios (Level III), a zero or one binary scoring system, or a simple variant, is used²⁶. The result is that 13-14 core indicators (the institutional-governance variables, the quality of bank management, and capital market valuations) with the widest observed statistical range²⁷ dominate our index of informational quality. A large number of low variance criteria are, however, still desirable to limit sampling bias and to flesh out the characteristics of financial systems when information is incomplete or opaque²⁸.

III.1.2 A policy matrix approach to assessing informational quality

An indicators approach is limited by difficulties in capturing informal behaviour and by the reliability of official data. However, surveys can capture many aspects of actual behaviour, albeit on the basis of subjective evaluations (e.g., the International Country Risk Guide [ICRG] index reflects the views of international respondents). Paradoxically, this does not apply to specific regulatory rules. Thus, just because a country claims that a specific rule is in place, this is no guarantee it is being applied. Indicators are an obvious over-simplification of reality. However, a representative profile can still be built up if complementary data are available. Thus, judging whether the international criterion (30-day payments arrears) for classifying non-performing loans (NPLs) is being enforced is fraught with difficulties. In this case, other criteria will help because NPLs are highly correlated with weak accounting practices and legal enforcement. Similarly, the record of financial crises over the previous five years or yields on subordinate bank debt are useful crosschecks.

Despite limitations, a policy matrix can provide insights into the scope for improving individual systems based on peer comparisons. Thus, Indonesia, Mongolia, Sri Lanka and other Asian EMEs clearly need to improve further their prudential regulatory standards. However, what priorities and sequencing to adopt is unclear. One option is to import best practice regulatory systems “off the shelf” (e.g., the Philippines has recently adopted US value-at-risk models), although this risks being over-ambitious. But, how to define an optimum policy profile is a daunting challenge. By contrast, our approach generates a “strategic diagnosis”, based on item-by-item comparisons with countries with much better standards, (but comparable per capita GDP and social infrastructure [e.g., Brazil and Peru]). Moreover, if adequate historical coverage is built up, insights into policy sequencing may be possible. Last, this diagnosis can be assessed against a statistical “benchmark” derived from a cross-section of countries. However, a policy matrix is not a panacea. It serves no useful purpose if countries

²⁶ A problem with binary cut-off criteria is the low degree of variation in the sample, because data points are classed in just two (or three) categories. The use of 14 such criteria minimizes this problem.

²⁷ Indicators with the widest statistical range will dominate individual country rankings. Observed ranges for specific indicators in 1998 are shown in brackets in Table 2.

²⁸ It should be noted that *absolute unscaled scores* (shown in the policy matrix) reflect *individual country progress over time*. By contrast, *scaled scores* (0 to 10) are relevant for assessing individual country positions (at points in time) *relative to other countries* in the sample, and are relevant when capital accounts are open.

regard the exercise as a beauty contest and deliberately obfuscate their diagnosis to stifle domestic criticism.

Table 2:

Indicators of the Informational Quality of Financial Markets

(Observed 1998 statistical range in brackets)

The institutional-governance environment

Rule of Law (8.1) (ICRG, cited by La Porta et al. 1998, 1998-1999 estimates from World Bank Development Indicators)
 Efficiency of the judicial system (7.1) (La Porta, from Business International Corp.)
 Corruption (7.9)
 Enforcement (6.4)
 Ownership by the three largest shareholders of the 10 largest non-financial corporations (6.8) (Moody's, cited by La Porta, except for Korea based on Zhuang et al. 2000. Estimates for the transition economies, PRC, Russia and Saudi Arabia are author's estimates based on peer group comparisons)
 Creditors' rights (5) (La Porta, from bankruptcy and reorganization law and authors' estimates, as above)
 Shareholders rights (5) (La Porta, based on company law and authors' estimates)

Prudential regulation and the structural strength of banks

Accountancy standards (6.3) (Centre for International Financial Analysis and Research, cited by La Porta, and authors' estimates)
 Rules-based early warning or prompt corrective action systems (1) (Hawkins and Turner 1999 [henceforth, H&T])
 Moral hazard: maximum deposit insurance coverage/per capita GDP (2) (Gillim 1999)
 Harmonized surveillance of non-bank financial institutions (1) (H&T)
 Ad hoc measures to save bankrupt banks (2) (authors' estimates)
 Bank capitalization ratios (2) (H&T, *The Banker*, various issues)
 Prudential lending limits [H&T]
 ■ Related lending limits (2)
 ■ Single borrower limits (2)
 ■ Risk-related capital requirements (1)
 ■ Market-related capital limits (1)
 Recent (last five years) financial crises (2) (Demirguc-Kunt and Detragiache, January 1999)
 Non-performing loans, definition (3) and provisioning (3) (H&T)
 Quality of management (4) (percentage of bank assets held by foreign banks, H&T and Beck et al. 1999)
 Proportion of state-owned or controlled banks (3) (H&T and Beck et al.)
 International financial centres 10 largest OECD countries (4) (authors' estimates)
 Established OECD/BIS membership (1)

Memorandum items

Moody's median bank financial strength ratings (H&T)
 M2 and private credit to GDP ratios (Beck et al.)
 Per capita GDP/PPP (World Bank and OECD Economic Indicators)

Functional quality of capital markets

Private bond market capitalization/GDP (63) (Beck et al.)
 Turnover of interest rate derivatives (12) (BIS)
 Stock market capitalization scaled by turnover (272) (Beck et al.)

III.2 The institutional-governance environment

A sound institutional-governance environment is essential to good economic systems. Seven indicators are used to gauge this concept (Table 2). These draw on the 1998 study by La Porta et al. on *legal systems* for 49 of the 55 countries in the sample. Estimates for the four transition economies, PRC and Saudi Arabia (and 1998-1999 data for all countries) are based on the ICRG summary estimates²⁹. Despite standardization of data sources, intercountry comparisons should be treated with caution because the presence of foreign investors in these latter countries is quite recent. The results of the ICRG index are shown as “the enforcement of legal systems” along with the overall institutional-governance environment index in Table 3. Four sub-categories that group countries according to the origins of their legal systems are also shown at the bottom of Tables 1, and 3 to 6 based on the classification of La Porta et al. PRC, Russia and Saudi Arabia were not categorized.

Sound property rights (measured by *shareholder and creditor rights*) are also essential aspects of developed financial systems. Thus, the study underscored the fact that countries with legal systems of *French* or *Spanish* origin have the weakest creditor rights, while *German* and *Scandinavian* systems have *the strongest*. By contrast, legal systems of English origin have the strongest shareholder rights; while French/Spanish-based systems have the weakest³⁰. Differences in property rights illustrate a salient feature of the hierarchy among institutions (cf. Schema 1). As noted by R&Z, weak property rights can be compensated for in other ways (notably better legal institutions and polity). Thus, Australia, Canada, France, Switzerland, US (and Chile) have good banking systems despite weak creditors’ rights. Similarly, France and Spain have developed relatively good equity markets despite weak shareholder rights. By contrast, the reverse feedback effects from strong property rights to good governance and polity is less evident³¹.

Apart from legal systems and property rights, “*politics*”, as emphasized by R&Z, appears to play a central role in impeding the evolution of sound institutions. Political obstacles are proxied here by *ownership concentration* (based on data reported to Moody’s). Our indicator is the inverse of the percent ownership of the three largest shareholders in the 10 largest non-financial domestic firms. The median rather than the

²⁹ The ICRG is based on surveys of international firms for 22 components of risk, grouped into three categories (political, financial and economic). These are subjective evaluations and reflect an “external assessment” of domestic risk. Countries not subject to risk evaluations rarely attract private foreign capital. The sole difference between our coverage is that La Porta’s index of enforcement includes separate measures of the risk of expropriation and contract repudiation. As our principal focus is on the institutional-governance environment, the efficiency of judicial systems, rule of law and corruption are included as separate indicators, as well as the index of enforcement, giving a slightly higher weighting to the first three criteria. [Assessments and evaluations not endorsed by ADB/I]

³⁰ Creditor and shareholder rights estimates for the same six countries were made on the basis of comparisons with the French and German legal systems (see notes to policy matrix).

³¹ For example, Pakistan and the Philippines have strong shareholder rights, but weak legal institutions; similarly the Russian privatization programme based on the premise that changing ownership and property rights would change behaviour (Coase’s theorem) proved too optimistic in the light of weak governance (see Williamson 2000).

average is used to limit the influence of outliers³². Interestingly, Asian EMEs have a higher degree of ownership concentration than in Latin American EMEs, despite a more equal income distribution, probably reflecting the dominance of family-run firms.

III.2.1 Country rankings

The institutional-governance environment index is an unweighted arithmetic mean of the seven indicators above (Table 3 and Figure 4). A key issue is whether countries with common law systems have better legal and financial systems than countries with civil code systems, as postulated by La Porta et al. In fact, we found the 12 countries with a Scandinavian/German civil code heritage have better legal enforcement than the 18 common law countries; moreover, the differences in the institutional environment between these two groups are indistinguishable. By contrast, the 22 civil code French/Spanish/Portuguese heritage countries were the weakest on both counts, in conformity with the hypothesis of La Porta et al., although the reasons are unclear.

These nuances are important: if legal origins are indeed critical, radical reform in laggard countries could take up to a century; by contrast, if enforcement is key, pragmatic reform might be accomplished over a 10-20 year time horizon.

III.3 The regulatory environment and structural strength of banks

Sketching a representative profile of the regulatory and structural strength of banks is important because they are cornerstones of the financial system in most EMEs. This is complicated because EMEs are often subject to volatile cyclical swings. Our methodology differs radically from those of international rating agencies by focusing on microeconomic indicators rather than on macroeconomic variables, such as growth, inflation, and fiscal and external positions. Sixteen indicators are used to proxy these concepts, and relate to the bottom of Level III of the policy matrix: i.e., enforcement of the rules or “the play of the game” (Schema 1). This subindex is dominated by measures of accounting standards, the definition and provisioning for NPLs, and the quality of bank management. Ten binary cut-off indicators are also used to flesh out structural aspects of banking systems. These indicators are compared with Moody’s median Bank Financial Strength-Ratings (BFSR) and bank credit/GDP ratios in 1997 in Table 4 and graphed in Figure 4.

³² Even so, this measure probably shows lower concentration in Asian EMEs than in OECD countries, owing to weak corporate disclosure and the prevalence of minority-controlled holding companies to mask family control of Asian conglomerates. An example of this is the 20% ownership concentration figure shown for Korea in La Porta et al. (1998). This estimate is controversial and the Korean figure (based on Zhuang et al. 2000) has been estimated at 42.6%, giving a reading of 5.7 on an inverted scale of 10 (similar to other Asian EMEs) by the authors to reflect “effective corporate control” via minority-controlled holding companies.

Table 3:
The Institutional and Governance Environment
(Index 0-10)

Economy	Origin of Legal Systems	Enforcement of Legal Systems		Summary Indicator	
		circa 1990	1998	1995	1998
Argentina	Spanish	5.6	7.6	4.0	5.2
Australia	English	9.5	9.2	9.1	8.2
Austria	German	9.5	9.3	7.6	6.6
Belgium	French	9.5	8.8	6.8	4.9
Brazil	Portuguese/Span.	6.2	6.7	4.1	3.4
Canada	English	9.7	9.4	9.5	8.6
Chile	Spanish	6.6	7.7	5.6	5.9
China, People's Rep. of	n.a.	4.8	8.3	0.9	3.6
Colombia	Spanish	4.7	6.2	1.4	1.5
Czech Republic	German	6.0	8.3	3.3	4.9
Denmark	Scandinavian	9.9	9.6	8.7	7.7
Ecuador	French/Spanish	6.0	6.0	3.7	2.3
Egypt	French	4.9	7.6	2.4	4.4
Finland	Scandinavian	9.9	9.8	8.3	7.5
France	French	8.8	8.8	7.6	6.8
Germany	German	9.2	9.1	7.8	7.0
Greece	French	6.7	8.4	3.4	4.2
Hong Kong, China	English	8.8	8.6	8.4	7.5
Hungary	German	6.0	8.3	3.3	4.9
India	English	5.5	7.2	4.4	5.4
Indonesia	French	3.4	5.8	1.5	2.9
Ireland	English	8.4	9.7	6.8	7.7
Israel	English	7.4	7.8	6.5	6.1
Italy	French	7.5	8.5	5.1	5.2
Japan	German	9.2	9.3	9.2	8.9
Jordan	French	5.8	8.0	2.9	4.2
Kenya	English	5.4	6.5	3.6	3.6
Korea	German	5.9	8.9	4.6	7.3
Malaysia	English	7.6	8.3	6.8	7.0
Mexico	Spanish	5.5	7.7	2.1	3.3
Netherlands	French	10.0	9.7	8.4	7.4
New Zealand	English	9.9	8.7	8.7	6.5
Nigeria	English	4.2	6.4	2.3	3.6
Norway	Scandinavian	10.0	9.8	8.7	7.9
Pakistan	English	3.8	6.4	2.2	4.0
Peru	Spanish	4.4	7.4	1.7	3.9
Philippines	Spanish	3.6	8.0	1.4	5.5
Poland	French	6.0	8.4	3.3	4.9
Portugal	French	7.6	9.0	5.1	5.9
Russia	n.a.	4.0	5.6	0.0	0.0

Table 3 continued: Institutional-Governance Environment

<i>Economy</i>	<i>Origin of Legal Systems</i>	<i>Legal Enforcement</i>		<i>Summary Indicator</i>	
		1990	1998	1995	1998
<i>Saudi Arabia</i>	<i>n.a.</i>	4.9	7.7	1.0	2.8
<i>Singapore</i>	<i>English</i>	8.9	10.0	8.3	9.1
<i>South Africa</i>	<i>English</i>	6.3	7.8	5.4	6.2
<i>Spain</i>	<i>Spanish</i>	7.4	8.5	5.8	6.3
<i>Sri Lanka</i>	<i>English</i>	4.4	6.7	2.4	3.8
<i>Sweden</i>	<i>Scandinavian</i>	10.0	9.4	8.5	7.1
<i>Switzerland</i>	<i>German</i>	10.0	9.7	8.3	7.3
<i>Taipei, China</i>	<i>German</i>	7.8	8.4	7.4	7.5
<i>Thailand</i>	<i>English</i>	5.4	8.3	4.2	6.7
<i>Turkey</i>	<i>French</i>	5.0	5.9	2.9	2.5
<i>United Kingdom</i>	<i>English</i>	9.2	9.4	10.0	10.0
<i>United States</i>	<i>English</i>	9.6	9.5	9.9	9.5
<i>Uruguay</i>	<i>French/Spanish</i>	5.7	7.9	3.0	4.4
<i>Venezuela</i>	<i>Spanish</i>	6.0	6.8	3.7	3.4
<i>Zimbabwe</i>	<i>English</i>	5.3	6.3	3.4	3.3
Median		6.3	8.3	4.6	5.5
<i>English origin</i>		7.2	8.1	6.2	6.5
<i>French/Spanish origin</i>		6.2	7.7	3.9	4.5
<i>German</i>		8.0	8.9	6.4	6.8
<i>Scandinavian</i>		10.0	9.6	8.5	7.6

III.3.1 The regulatory environment³³

Experience shows that a pre-requisite for the emergence of a sound regulatory environment is *good accountancy standards* (see Table 2). Accountancy standards are essential for transparency (as they act as an interface between rules and enforcement). Indeed, good standards have become more relevant in the light of revelations of shoddy auditing practices, the opaque nature of company accounts in many EMEs and recurring financial scandals³⁴. Nonetheless, globalization and the growing numbers of companies seeking foreign capital and international stock price listings are accelerating the adoption of international accounting standards (often US Generally Accepted

³³ A separate sub-index for the regulatory environment is calculated in the policy matrix, but not shown in Table 4 as only one qualitative variable (accountancy standards) and four binary variables are used. A wide array of regulatory variables is presented for 107 countries by Barth et al. (2000).

³⁴ The high scores assigned to Japanese and Korean accountancy standards by La Porta et al. seem generous following revelations of shoddy auditing procedures in post-1997 financial scandals. Missing observations for accountancy standards and ownership concentration were made by peer comparison, which may be preferable to simple regression techniques or crude pooling techniques (see Hall and Jones 1999).

Accounting Principles [GAAP])³⁵. An equally effective way of enhancing transparency would be to make independent external auditing obligatory and auditors legally accountable for their work (as in Argentina)³⁶.

The regulatory environment is proxied by four other indicators. A revealing criterion is the presence of rules-based as opposed to discretionary policy instruments. Rules-based *early warning systems* and *prompt corrective action programmes* are far more credible in EMEs when there is weak rule of law, inefficient judicial systems and pervasive corruption. Looking at past financial crises, a common pitfall has been discretionary *ad hoc measures to protect weak or unviable financial institutions* when they face difficulties. In fact, regulatory capture, (corruption) and/or the failure to close bad banks are remarkably recurrent and widespread phenomena (Brazil; France; India; Indonesia; Japan; Korea; Malaysia; Mongolia; Norway; Philippines; Thailand; Taipei,China; and Turkey provide recent examples). Indeed, there are virtually no examples of regulators closing viable banks, although optimal timing is another question (Demirguc-Kunt and Detragiache 1998; henceforth, D&D).

Another recurring problem in Asian EMEs is the legacy of government intervention and implicit moral hazard³⁷. *Deposit insurance schemes* (DISs) provide interesting aspects of moral hazard. Microeconomic theory suggests that compulsory universal deposit insurance schemes can be justified to stem financial panic and bank runs. However, they are normally undesirable because they can lead to adverse depositor and bank behaviour in the presence of blanket coverage (e.g., Japan and Turkey recently, or the US savings and loans in the 1980s), as well as a “too-big-to-fail” mentality. To proxy this feature, we use maximum DISs coverage relative to per capita GDP as an indicator, scaled so that a neutral reading is equivalent to the world average of three times per capita GDP (see Gillim 1999).

Common prudential standards for all deposit-taking financial institutions are another uncontroversial common sense guideline, although it is followed in few countries. Indeed, a common systemic regulatory weakness in many Asian EMEs (Indonesia; Korea; Malaysia; Taipei,China; and Thailand³⁸) was the failure to upgrade enforcement of newly franchised banks — especially rapidly growing non-bank financial institutions — following deregulation in the late 1980s. Another lapse was the lax standards for credit unions and savings co-operatives providing credit to rural areas, fishermen, farmers, artisans and small businesses.

³⁵ Accounting and auditing standards are being raised in Latin America, as the region becomes more integrated into the world economy. A similar process is beginning in Korea (as well as Japan and other Asian economies). Recent improvements include the introduction of combined as opposed to consolidated company accounts, which will reveal the profit/loss situation in minority-owned, but effectively controlled, (holding) companies. The other key change will be to mark assets to market, rather than to book value.

³⁶ Conflicts of interest, because external auditors are paid by the institutions they audit, has yet to be addressed. One solution is bonded auditors, who are legally liable for the veracity of the accounts they vet.

³⁷ Korea was typical of this situation. Despite extensive privatization in the 1980s, about one third of bank lending was either government directed or made by state-controlled banks, as late as the early 1990s.

³⁸ For example, Malaysia ran a two-tier supervision system from 1994 to 1997 with poor results, whereas India adopted a common prudential system in 1993. Scandinavian countries adopted common prudential systems in the early 1990s.

III.3.2 Structural indicators for banks

BIS-recommended capitalization and prudential ratios (based on the CAMEL³⁹ principles) and international classification and provisioning of NPLs have been used to flesh out the structural strength of banks. These are interpreted using information reported to BIS (Hawkins and Turner 1999 and data reported in *The Banker*). A central criterion is the BIS-recommended 8% minimum bank capitalization ratio. If countries exceed this minimum they are rated as +1; those meeting the ratio as zero (or neutral), while those below it are rated as minus one. This reflects the argument that EMEs should adopt higher capitalization standards than the minimum to reflect the greater cyclical volatility of their economies⁴⁰. In fact, many Asian banks failed to meet these minimum standards, which left their financial systems vulnerable to contagion. Another fault line was widespread prudential forbearance or disregard of *basic prudential lending limits*⁴¹. In the aftermath of the crisis, the collapse of a number of (near) banks (e.g., in Indonesia, Korea and Thailand) *revealed excessive single borrower bank exposure*, as well as severe breaches of *related lending limits* (often to family-run firms controlled by the banks' owners through third party loans or dummy accounts). Such improper lending practices led to excessive company gearing and left some banks over-exposed to company or sector specific shocks, which exacerbated weak capitalization standards.

III.3.3 The quality of bank balance sheets and management

A key factor determining the asset quality of balance sheets is the proportion of NPLs. Two key indicators are the application of *internationally accepted definitions for NPLs and their provisioning*. Despite the simplicity of these criteria, they are difficult to judge in practice when there is a tradition of related lending and “evergreening” of problem loans. Indeed, formal adherence to rules is no guarantee that problem loans are being properly classified and that prudential limits are being followed. Further, the general rule that NPLs should be “marked to market” is difficult to apply because there is no market for damaged assets in most EMEs. To partially compensate for this bias, the history of severe *financial crises* over the past five years is included as a separate indicator⁴².

³⁹ Capital, assets, management, earnings and liquidity.

⁴⁰ This is the practice in Argentina; Brazil; Hong Kong, China; Malaysia; Peru; and Singapore. India and Indonesia are planning to follow suit in the future. Philippine authorities indicate that bank capitalization ratios are 10%, and thus above the 8% minimum. These are not shown by BIS data because the new directives date from March 1998. Data for a number of countries in Africa are fragmentary.

⁴¹ Ratings for prudential-related lending limits and single borrower exposure are scaled as the previous indicator, according to the stringency of current practices.

⁴² The definition and timing of financial crises draw on D&D 1998. Their criteria define a crisis when NPLs exceed 10% of banking sector assets and the cost of the rescue operation was at least 2% of GDP. And, when banking sector problems led to large-scale nationalization, bank runs took place or emergency measures were needed, such as deposit freezes, prolonged banking holidays or generalized deposit guarantees to restore public confidence. Few countries have adopted the more effective US technique of forward provisioning of potential NPLs, so this is not used as an indicator. However, this illustrates the gap between standards in EMEs and best practice techniques (Chile and Peru have adopted this approach and Korea will do so in 2001).

Last, there is a consensus that the quality of a bank's balance sheet depends crucially on "good management". However, this is hard to define, let alone measure. Several empirical studies (Levine 1998, as well as Moody's and Standard and Poor's) use the spread between deposit and lending rates as proxies. In our opinion, this is misleading because bank lending margins are strongly affected by entry barriers, and their erosion following deregulation can give misleading or ambiguous signals⁴³. Moreover, bank lending margins are notoriously pro-cyclical.

– *The role of foreign banks*

By contrast, the relative importance of foreign and private sector banks appears to be an excellent proxy for the quality of management (and governance). Indeed, several empirical studies show that these factors are related to quantum differences in bank efficiency and improvements in failure rates, as a strong foreign presence promotes competition, the adoption of better management techniques and new technologies in EMEs (see D&D 1999). Moreover, this is an effective way of "importing" first world prudential regulatory standards, as foreign banks (typically US, UK, Dutch and Spanish [in Latin America]) must also comply with home country regulatory standards for overseas operations. On the other hand, very poor countries are typically unattractive destinations for foreign banks. To allow for this factor, our indicator of foreign bank assets is scaled positively (by asset tranches of 10-20%), for countries with per capita GDP (purchasing power parity [PPP] based) above \$3,000 (see Table 1). For countries below this income cut-off level, a single score of minus one is assigned⁴⁴.

– *The role of state-owned and private banks*

Against this backdrop, *the share of state-owned banks in total bank assets* is a useful complementary indicator of management quality when foreign bank presence is discouraged by capital controls. However, this indicator is not without controversy. In virtually all of Asia's low-income economies (e.g., Bangladesh, Cambodia, PRC, India, Lao People's Democratic Republic, Mongolia, Myanmar, Nepal, Pakistan, Sri Lanka, Turkey, Viet Nam, etc.) state-owned banks dominate the allocation of credit, as a part of government social-economic development strategy. Indeed, some proponents of state-

⁴³ High margins may reflect rents from entry barriers, as well as strong macroeconomic conditions, rather than efficiency. This appeared to be the case in countries characterized by financial repression before financial market liberalization in the late 1980s. Moreover, as a salient feature of East Asian banking systems is the large number of small family-run banks, attaining critical mass and maintaining franchise values may be necessary conditions for investing in the improved monitoring of their clients.

⁴⁴ To illustrate how this nonlinear scoring system works, Hong Kong, China and Singapore receive the highest ratings among EMEs, because foreign-owned banks represent more than 70% of total assets. Latin America and the Eastern transition economies received average ratings, reflecting the substantial increase in foreign presence (to the 20-30% range) since the 1980s. By contrast, most of the middle-income crisis East Asian economies receive low ratings, as foreign bank presence is still in single digits, while it is minuscule among the poorest countries in Asia (Bangladesh, Cambodia, PRC, India, Mongolia, Myanmar, Nepal, Pakistan, Sri Lanka, Viet Nam, etc.). For OECD countries (excluding Czech Republic, Hungary, Korea, Mexico, Poland and Turkey) this proxy was replaced by status as an international financial centre (based on the number of foreign banks), which flatters the position of Japan, given the poor competitive position of its domestic banks.

led bank lending lauded the resilience of their financial systems during the 1997-1998 financial crisis, while stressing the role of “financial stability” in contrast to the financial meltdown experienced in the Asian crisis economies. Ironically, the reasons why state-dominated financial system weathered Asia’s 1997 financial crisis probably reflected closed capital accounts rather than state ownership. Capital controls merely prevent the large-scale entry – and hence exit – of capital flows.

In fact, any economic system must strike a balance between stability (equity) and efficiency. To be sure, state ownership (and closed capital accounts) has prevented bank failures in EMEs.

However, these characteristics (together with government directed lending) are virtually synonymous with massive NPL problems in Asia⁴⁵. Moreover, repeated recapitalization of badly-run, state-run banks (Bangladesh, Mongolia, Pakistan, Sri Lanka, Turkey, etc.) has singularly failed to improve their performance. Indeed, experience with privatization shows that striving for world-class excellence, while pursuing a wide range of social objectives, is almost always incompatible. An illustration of such conflicts is the systemic weakness of Asia’s credit co-operatives and rural thrift institutions, serving farmers, fishermen, artisans and small business. This is not to argue that these segments of the economy should be deprived of bank credit, but rather that special lending agencies or transparent subsidies should be assigned this task, to minimize cross-subsidization and poor lending practices⁴⁶.

Last, unlike many analysts, this paper does *not* use bank concentration ratios to proxy. Such ratios have been a traditional way of analyzing industrial structures, efficiency because concentration is considered bad for competition and efficiency. However, this concept is rapidly losing relevance in a globalized economy. Moreover, it gives the wrong signals in the presence of a large number of small, under-capitalized family-run banks and rural thrift institutions (e.g., in Malaysia; Philippines; Taipei, China; etc.). In fact, consolidation of excess bank capacity should be a priority in many EMEs, if they are to raise operating efficiency sufficiently to compete in world markets. Competition policy should not be ignored. However, this can best be assured by sound prudential supervision, followed by deregulation, lower entry barriers, and especially by encouraging greater foreign competition and equity participation.

⁴⁵ Obtaining reliable NPLs data for low-income, state-owned banking systems (e.g., Bangladesh, PRC, India, Mongolia, Nepal, Pakistan, Sri Lanka, etc.) is difficult. Private sector estimates place NPLs in the 40-50% range or higher. In Mongolia, two state-owned banks with NPLs of 50-70% have been liquidated.

⁴⁶ This indicator is scaled in a similar way as that for foreign banks, with a cut-off level for countries with per capita income levels below \$3,000 (PPP). This approach does not overly penalize heavy state ownership among the poorest countries, but does lower Germany’s ratings because *Länder* and *Sparkassen* (state-run) banks account for almost half of total bank assets and remain a major obstacle to consolidation and improved efficiency.

Table 4:
The Regulatory Environment and Structural Strength of Banks

<i>Economy</i>	<i>(Index 0-10)</i>			<i>Median Moody's BFSR Rating</i>	<i>Bank Credit % 1997 GDP</i>
	<i>1985</i>	<i>1995</i>	<i>1998</i>		
<i>Argentina</i>	6.1	5.8	5.9	D	20
<i>Australia</i>	8.6	8.4	8.5		77
<i>Austria</i>	6.1	5.4	5.2		98.8
<i>Belgium</i>	6.8	6.0	6.2		65.5
<i>Brazil</i>	4.8	4.3	4.1	D	26
<i>Canada</i>	9.0	8.7	8.8		86.3
<i>Chile</i>	7.2	7.2	7.3	C	58
<i>China, People's Rep. of</i>	2.1	1.9	1.8	E+	103
<i>Colombia</i>	6.3	6.7	6.5	C	24
<i>Czech Republic</i>	4.6	4.5	4.7	D	77
<i>Denmark</i>	6.4	5.7	6.2		30.8
<i>Ecuador</i>	0.8	0.4	0.4		26.3
<i>Egypt</i>	0.6	0.5	0.5		37
<i>Finland</i>	7.4	6.6	7.1		55.2
<i>France</i>	7.5	7.4	7.2	C	80
<i>Germany</i>	6.8	7.2	6.9	C	108
<i>Greece</i>	4.8	4.3	4.1		33.6
<i>Hong Kong, China</i>	8.8	7.8	7.9	C	165
<i>Hungary</i>	4.6	4.9	4.7	D	26
<i>India</i>	1.6	1.4	1.7	D	23
<i>Indonesia</i>	0.4	0.7	1.1	E	61
<i>Ireland</i>	7.6	6.7	6.5		32.7
<i>Israel</i>	6.5	5.7	5.5	D+	75
<i>Italy</i>	7.2	6.4	6.2		50.4
<i>Japan</i>	5.3	5.6	6.1	D	114
<i>Jordan</i>	3.8	3.4	3.2		68.4
<i>Kenya</i>	2.7	2.4	1.9		28.2
<i>Korea</i>	3.9	3.8	4.4	E+	71
<i>Malaysia</i>	7.0	5.8	5.6	D	104
<i>Mexico</i>	3.5	4.3	4.3	E+	12
<i>Netherlands</i>	7.3	6.5	6.3		177
<i>New Zealand</i>	7.6	6.7	7.2		94.4
<i>Nigeria</i>	2.5	1.8	1.8		7.8
<i>Norway</i>	5.2	4.4	5.4		85.4
<i>Pakistan</i>	2.4	2.5	2.4	..	23.3
<i>Peru</i>	6.9	6.9	7.4	D+	23
<i>Philippines</i>	6.1	5.8	6.3	D+	60
<i>Poland</i>	2.9	3.7	3.6	D	24
<i>Portugal</i>	4.8	4.6	4.5		62.7
<i>Russia</i>	0.0	0.0	0.0	E	9

Table 4 continued: The Regulatory Environment and Structural Strength of Banks

	1985	1995	1998	BSFR Rating	Bank Credit % 1997 GDP
<i>Saudi Arabia</i>	4.6	4.5	4.3	D+	24
<i>Singapore</i>	9.2	8.1	8.2	C+	110
<i>South Africa</i>	7.9	7.0	7.1	C	71
<i>Spain</i>	7.7	7.2	7.0		75.6
<i>Sri Lanka</i>	3.2	2.9	2.8		22.3
<i>Sweden</i>	6.8	5.7	6.6		57.4
<i>Switzerland</i>	9.6	8.9	8.6		166.9
<i>Taipei,China</i>	5.7	5.4	5.6	„	141
<i>Thailand</i>	4.4	3.5	3.4	E	116
<i>Turkey</i>	1.7	1.9	1.8		18
<i>United Kingdom</i>	10.0	10.0	10.0	C+	120
<i>United States</i>	9.3	9.0	8.7	C+	67
<i>Uruguay</i>	3.0	3.0	2.9		27.4
<i>Venezuela</i>	5.0	4.9	4.7	D	12
<i>Zimbabwe</i>	2.5	2.6	2.5		19.7
<i>Median</i>	5.7	5.4	5.5		60.0
<i>English origin</i>	6.1	5.6	5.6		69.0
<i>French/Spanish</i>	4.8	4.6	4.6		47.4
<i>German</i>	5.8	5.7	5.8		100.3
<i>Scandinavian</i>	6.5	5.6	6.3		57.2

III.3.4 Preliminary country rankings

Our indicator of the regulatory environment — structural strength of banks — shows UK; US; Switzerland; Canada; Australia; Hong Kong, China; and Singapore with the strongest banking systems and PRC, Indonesia, Pakistan, India, Sri Lanka and Russia with the weakest. To provide some perspective, our index shows that Chile, Colombia and Peru have sounder banking systems than Japan; Korea; Malaysia; Philippines; Taipei,China; and Thailand⁴⁷, without the stronger creditor rights inherent in German legal systems (adopted by Japan; Korea; and Taipei,China). Moreover, Latin American countries do not enjoy the advantages of established *OECD/BIS* membership or Japan's reputation as a *world financial centre*⁴⁸. Other salient features are the close correlation between good banking systems and the institutional-governance environment, confirming the causal hierarchy explicit in the policy matrix; and the small degree of

⁴⁷ Despite improvement, Japan's banks were ranked 24th in 1998. Before the establishment of the Financial Services Agency (FSA), Japan's inability to close (or to implement radical re-capitalization of) insolvent banks had undermined the credibility of its supervision system. It is too early to tell how successful the FSA will be. However, this shift in regime represents a "quantum" leap in the structural strength of supervision, as deep-seated problems may finally be addressed.

⁴⁸ Long standing OECD/BIS membership and status as a world financial centre reduces perceived sovereign risk, as lower BIS risk-weighted capital requirements are required. Without these advantages, Japan's banking system would drop further in status.

dispersion between countries and sub-groups by legal origins, reflecting low institutional entry barriers into banking activities.

Last, our regulatory banking systems index yields similar ordinal country rankings as the Moody's median Bank Financial Strength Ratings (BFSR), albeit with much greater variance. By comparison, the Moody's rating criteria appear to reflect "financial solvency" rather than microeconomic incentive structures, as their ratings for PRC, India and Russia compare surprisingly favourably to other EMEs (perhaps because of capital controls and implicit government guarantees)⁴⁹.

III.4 The functional quality of capital markets

Capital markets play a central role in mature market economies by allocating scarce capital, providing alternative sources of financial intermediation to firms and monitoring their performance. Good capital markets are rare, as they require a scarce quality – public confidence in a level playing field. Rigorous enforcement of regulatory and disclosure standards is a quintessential example of a public good. When these conditions are met, asset prices contain important information concerning expectations and risk, as economic agents adjust to the transparent flow of information stemming from changes in policy, new technologies and other shocks. By contrast, when information is opaque, capital markets tend to be thin. East Asia falls into the latter category, as its capital markets are susceptible to self-selection bias (the "lemons problem"), insider trading, excessive volatility and speculative bubbles. This makes it difficult to filter out information from noise and raises the methodological issue: how much weight should be assigned to volatile stock market prices?

III.4.1 What weight should be assigned to the equity as opposed to private bond markets?

Our view is that given the capital constraints facing firms, the most relevant criterion for judging the quality of capital markets is their capacity to price risk. Hence, twice the weight is assigned to the private long-term debt compared with the share market in calculating the functional quality of capital markets. An even higher weight could be justified because the β (inherent volatility) of US shares is six times that of bond prices. Moreover, the proportion of gross fixed investment financed by private bonds is several fold that for new equity finance.

In sum, the capital markets index is the only sub-index where we have weighted its components to filter out noise from information. Weights assigned to individual indices are shown in the square brackets below:

- The proportion of private sector bonds in GDP/10 [2].
- The daily turnover of interest rate derivatives/10 [1].

⁴⁹ The rating agencies' approach may reflect the limited availability of microeconomic information and the necessity of using highly correlated regional macroeconomic indicators. In the event, the failure of sovereign debt and BFSR ratings to foreshadow the voracity and contagion of Asia's crisis in 1997-1998, and the weak spillover effects on Latin America following Russia's 1998 debt default, is prompting a revision of its methods.

- Stock market capitalization in GDP [1].
- The above scaled by turnover/10 [1].

Table 5 and Figure 3 present our summary estimate of the quality of capital markets in 1998, along with data for stock market and private bond market capitalization.

III.4.2 Long-term private debt markets

A frequent policy recommendation following the East Asian financial débâcle was the need for better long-term private debt markets, to lessen dependence on bank intermediation. Private bond markets are important because they provide a market assessment of the quality of company management and risk, and monitor cash flow – areas where Asian banks are weak. However, there are formidable obstacles to establishing such markets (even with favourable macroeconomic conditions). One is the small and fragmented nature of East Asia’s public debt markets, and the lack of government “benchmarks” to help private investors calibrate financial risk (this problem is being addressed)⁵⁰. Other obstacles include weak banking systems, illiquid equity markets, poor bankruptcy laws, inefficient judiciary systems, and lax enforcement of securities and exchange regulations and bond covenants⁵¹. Further, poor auditing and corporate disclosure practices, excessive red tape, stamp duties, and the lack of a centralized bond and credit registry substantially raise transactions costs and risk.

Under such circumstances, the informational infrastructure is inadequate for converting uncertainty into sufficiently standardized risk suitable for attracting large-scale public demand. These shortcomings, along with the scarcity of high quality issuers, explain why long-term private debt markets are empirically the last financial market to be established⁵². In fact, the absence of long-term debt markets is the key reason for what some analysts call “original sin” (see McKinnon 2000). Nonetheless, the establishment of long-term bond markets in Greece, Portugal and Spain shows that upgrading auditing, securities and exchange rules and technical infrastructure, along with imaginative pricing policies⁵³, can overcome such problems in the space of about

⁵⁰ This reflected a legacy of fiscal conservatism. However, large budget deficits in the wake of the 1997 crisis have necessitated building deeper public debt markets. Other EMEs have also had difficulty in establishing long-term debt markets, owing to a legacy of debt defaults and high inflation.

⁵¹ Securities and exchange regulations (SERs) are the most relevant indicator in assessing the role of legal systems in capital markets. Unfortunately, no comparative studies covering EMEs have been made to date. Available information concerning SERs can be found on www.IOSCO.org.

⁵² The emergence of equity share markets before private long-term debt markets in EMEs with weak transparency is favoured by the higher reward to risk ratio for shares. Even though the disclosure requirements for an initial public offering are more stringent than for a repetitive bond flotation, with opaque information, both bondholders and shareholders risk losing their capital. However, for the bondholder the best-case scenario is payment of interest and reimbursement of capital. By contrast, if the business proves to be profitable, shareholders will benefit without limit, according to their equity stakes (Henning and Chatusripitak 2000).

⁵³ An interesting feature of local currency long-term bonds issued by multilateral development agencies in these three countries was the use of pricing techniques to tailor supply to potential demand. All three

10 years, if the macroeconomic framework is favourable (see Bröker 1993 and EIB 1999). The success of Denmark in developing a large, liquid market for mortgage-backed securities in the 19th century is also an interesting model for some East Asian economies.

Apart from Argentina, Brazil, Chile,⁵⁴ Korea and Malaysia, most EMEs (e.g., Thailand⁵⁵) have small or non-existent private bond markets. Private bond market turnover data in EMEs are rarely available, owing to an inactive secondary market, as most debt is short term or held to maturity. In 1995, Korea issued new long-term private debt (typically with a maximum maturity of three years) of more than 9% of GDP, followed by issues of 5% in Chile and Malaysia. Although these debt issues were usually for shorter maturities than in mature OECD economies (e.g., some US companies have even issued 100-year bonds), these figures compare favourably with the 7% and 12.5% for the US and Germany, respectively, which have the world's largest bond markets, along with Belgium, Denmark, Sweden and Switzerland. Hong Kong, China and Taipei, China (as well as the UK) issued insignificant quantities of long-term private bonds in 1995, indicating the enormous scope that exists for developing long-term debt markets.

III.4.3 Interest rate derivatives

The depth and efficiency of mature capital markets have been greatly enhanced by the introduction of financial derivatives. Derivatives provide economic agents with more efficient instruments for hedging, arbitration, speculation and the pricing of risk. Derivatives have been largely ignored in empirical studies of financial market intermediation (e.g., Levine 1998), in large part because a pre-requisite is a good long-term debt market. Derivatives are still largely confined to the largest, deepest and best regulated securities markets. Thus, BIS reports that *daily* turnover in over-the-counter (OTC) derivatives in April 1998 was \$1.684 trillion⁵⁶, of which \$343.5 billion represented interest rate contracts (with a growth rate of 18.1% from 1995-1998) and the rest in foreign exchange swaps.

countries issued 10-year bonds using floating rates *vis-à-vis* their money rates. Spain also used an innovative "step-up callable", which is a dual coupon bond with a call option for a change in coupon. It also issued a bond linked to the Madrid share price index. These latter instruments can be seen as using option theory to anchor expectations concerning the risks of devaluation.

⁵⁴ Data for the ratio of private bonds to GDP in Chile were not available in the World Bank databank for 1995 and has been approximated based on its high level (5% of GDP) of new debt issues.

⁵⁵ Data reported by the Bank of Thailand are indicative of the situation in many Asian EMEs. Total outstanding private debt in 1997 equalled B141.3 billion (\$2.1 billion or 2.8% of nominal GDP), of which 93.8% were debentures and the rest in negotiable short-term certificates of deposit.

⁵⁶ By comparison, share market capitalization of the high-income countries in 1999 was \$25.99 trillion with an average annual turnover of 97.5%.

Table 5
The Functional Quality of Capital Markets

<i>Economy</i>	<i>Stock Market</i>	<i>Private</i>	<i>Capital Markets Summary</i>		
	<i>Capitalization</i>	<i>Bonds</i>	<i>(Index 0-10)</i>		
	<i>1998 % GDP</i>	<i>1997 % GDP</i>	<i>1985</i>	<i>1995</i>	<i>1998</i>
<i>Argentina</i>	15.2	11.3	0.2	0.9	0.6
<i>Australia</i>	241.7	16.8	3.0	3.5	4.9
<i>Austria</i>	16.1	33.3	3.1	3.0	2.0
<i>Belgium</i>	99.0	53.1	6.7	4.6	3.6
<i>Brazil</i>	20.7	9.8	0.7	1.4	0.8
<i>Canada</i>	93.6	11.5	4.4	4.0	3.9
<i>Chile</i>	65.9	30	1.0	3.3	1.7
<i>China, People's Rep. of</i>	24.1	3.4	0.0	0.6	1.0
<i>Colombia</i>	13.0	0	0.1	0.1	0.0
<i>Czech Republic</i>	21.4	4.8	0.0	0.7	0.5
<i>Denmark</i>	56.5	105.9	9.7	9.3	6.5
<i>Ecuador</i>	8.3	0	0.0	0.1	0.0
<i>Egypt</i>	29.5	0	0.0	0.0	0.2
<i>Finland</i>	125.1	26.7	4.1	3.5	3.2
<i>France</i>	69.5	36.6	6.9	5.1	4.2
<i>Germany</i>	51.3	47.5	7.0	4.8	5.2
<i>Greece</i>	66.3	0.1	0.0	0.5	2.3
<i>Hong Kong, China</i>	206.3	12.6	3.0	4.1	3.7
<i>Hungary</i>	29.3	0.7	0.0	0.1	0.8
<i>India</i>	24.5	9.6	0.2	1.0	1.0
<i>Indonesia</i>	23.5	0	0.0	0.3	0.3
<i>Ireland</i>	36.6	0	0.5	0.9	0.8
<i>Israel</i>	39.4	0	0.2	0.4	0.3
<i>Italy</i>	48.6	33.3	2.0	3.1	3.1
<i>Japan</i>	66.0	33.3	8.3	4.7	3.3
<i>Jordan</i>	79.0	0	0.2	0.3	0.2
<i>Kenya</i>	17.5	0	0.0	0.0	0.0
<i>Korea</i>	35.7	34.1	2.4	4.9	5.1
<i>Malaysia</i>	136.0	41.5	2.2	6.3	3.6
<i>Mexico</i>	23.3	1.5	0.1	0.6	0.3
<i>Netherlands</i>	158.0	15	3.7	4.2	5.0
<i>New Zealand</i>	169.1	0	0.4	0.6	2.5
<i>Nigeria</i>	7.0	0	0.0	0.0	0.0
<i>Norway</i>	38.6	18	3.2	2.1	1.7
<i>Pakistan</i>	18.0	0	0.1	0.2	0.5
<i>Peru</i>	18.6	0	0.0	0.3	0.1
<i>Philippines</i>	54.2	0	0.0	0.8	0.7
<i>Poland</i>	12.9	0	0.0	0.1	0.2
<i>Portugal</i>	59.0	19.6	0.0	1.3	2.5
<i>Russia</i>	7.4	0.0	0.0	0.2	0.0

Table 5 continued: Functional Quality of Capital Markets

<i>Economy</i>	<i>Stock Markets</i>	<i>Private</i>	<i>Capital Markets Summary</i>		
	<i>1998</i>	<i>bonds</i>	<i>1985</i>	<i>1995</i>	<i>1998</i>
<i>Saudi Arabia</i>	33.0	0	0.0	0.2	0.2
<i>Singapore</i>	112.0	2.4	2.4	4.0	1.8
<i>South Africa</i>	127.6	0	0.4	0.6	1.1
<i>Spain</i>	72.7	7.8	0.3	1.2	4.3
<i>Sri Lanka</i>	10.9		0.0	0.1	0.0
<i>Sweden</i>	123.1	57.4	6.5	6.6	5.5
<i>Switzerland</i>	261.4	55.5	8.4	10.0	10.0
<i>Taipei,China</i>	102.7	0	0.6	6.3	7.2
<i>Thailand</i>	31.4	2.8	0.1	1.4	0.9
<i>Turkey</i>	16.9	0.4	0.0	1.3	0.5
<i>United Kingdom</i>	174.9	22.6	7.4	7.8	6.9
<i>United States</i>	163.4	62.6	10.0	9.0	9.4
<i>Uruguay</i>	1.0	0	0.0	0.0	0.0
<i>Venezuela</i>	8.0	0	0.0	0.0	0.0
<i>Zimbabwe</i>	20.7	0	0.0	0.1	0.1
<i>Median</i>	39.4	4.8	0.3	0.9	1.1
<i>English origin</i>	89.6	10.1	1.9	2.4	2.3
<i>French/Spanish</i>	43.8	9.9	1.0	1.3	1.4
<i>German</i>	73.0	26.2	3.7	4.3	4.3
<i>Scandinavian</i>	85.8	52.0	5.9	5.4	4.2

As our focus is on the private long-term debt market, we use the daily turnover of interest rate contracts as an indicator. These are absolute figures (divided by 10). Trade in derivatives is a good example of the importance of critical mass for establishing the efficient and continuous pricing of risk. In 1998, the UK (\$122.9 billion daily turnover) had twice as large an interest rate swap market as the US (\$58.4 billion), followed by France (\$40.6 billion), Japan (\$31.6 billion) and Germany (\$29.1 billion)⁵⁷. Active derivatives markets and deep long-term private debt markets are thus the defining empirical characteristics that separate a mature country's capital markets from the best EMEs (Chile; Hong Kong, China; Malaysia; Singapore; and Taipei,China). These qualities are also reflected in other measures, such as interbank interest rate borrowing spreads over London interbank offered rate (LIBOR), buy-sell spreads and turnover in secondary bond markets.

⁵⁷ Interest rate swaps in Switzerland were \$5.9 billion; Singapore \$5.3 billion; and Hong Kong, China, at \$2.4 billion, and lagged far behind. Derivatives trading in other EMEs (Chile; Korea; and Taipei,China) is tightly regulated and/or largely confined to foreign exchange swaps.

III.4.4 Share market capitalization and liquidity

A dramatic trend starting in the mid-1980s was the steeply rising stock market capitalization to GDP ratios in many countries. This reflected, *inter alia*, the world boom in privatization, the collapse of communism, world disinflation, and the globalization of financial markets. A salient feature of capitalization ratios is that seven countries had capitalization ratios of less than 15%, but 13 were in triple digits, indicating the vast gulf between poor and rich countries. Moreover, share markets in EMEs lack depth, with the 10 largest firms typically accounting for a third of capitalization. Turnover is often moribund: nine EMEs had stock market turnover ratios in 1995 in single digits. By comparison, in the world's most active share markets, turnover exceeded 200% in Spain and Switzerland, and has been as high as 400% in Taipei, China, while it ranged between 70 and 90% in Hong Kong, China; Malaysia; Singapore; UK; and US, which is indicative of enormous differences in financial market liquidity and shareholder culture.

Countries with deep liquid share markets have strong institutions, including credible minority shareholders' rights, transparent corporate disclosure rules, and good legal and political infrastructure. Thus, the development of better share (and bond) markets in EMEs probably needs to start by building the appropriate social and legal institutions, although this takes time⁵⁸. Since late 1997, minority shareholders' rights in Korea have been strengthened following the removal of many barriers to foreign ownership. It is too soon to judge how this will affect corporate governance, although early signs are positive⁵⁹. Most other Asian crisis economies have also taken measures to improve accountancy standards and to *raise corporate disclosure requirements* for share listings (see Zhuang et al. 2000).

Differences in stock market capitalization can also reflect the prevalent culture.⁶⁰ Notwithstanding low foreign participation, Taipei, China's extraordinary capitalization and stock market turnover reflect a unique share ownership culture, its large number of

⁵⁸ Privatization programmes in France and Germany have encouraged greater small shareholder participation. Many of France's and Germany's leading firms have also begun to change some of their most discriminatory rules (e.g., those preventing one share, one vote) that discourage broader minority equity ownership, in anticipation of international stock price listings in the UK and US. Share ownership in France and Germany, while growing rapidly, is still less than half that in Anglo-Saxon countries, because of the prevalent culture and weak role of institutional investors (notably, private pension funds, insurance companies and mutual funds).

⁵⁹ Large Japanese and Korean firms have started to appoint foreign directors and/or outside directors, as well as reduce the size of their company boards to more operational levels. Although, many directors still appear to have been appointed on the basis of seniority and loyalty, greater foreign equity participation does appear to be changing management attitudes concerning shareholder value. More vocal minority shareholder associations have also developed, encouraged by legal changes that allow directors to be sued for failing in their fiduciary responsibilities.

⁶⁰ Austria, with a per capita GDP of \$22,000 (PPP based), had a stock market valuation of only 12% of GDP in 1997. By contrast, Malaysia and Taipei, China (with per capita incomes of 20% and 65% this figure) had stock market valuation ratios of 245% and 85%, respectively. Stock market turnover ratios also differ: annual turnover was the equivalent of 70% of stock valuation in Austria and Malaysia, but 172% in Taipei, China.

small- and medium-size companies (SMEs)⁶¹, and a risk-taking culture (mirrored in a very small private long-term debt market⁶²). Despite these caveats, the best equity markets among Asian EMEs are not a statistical mirage⁶³. Nonetheless, the use of equity financing is relatively unimportant compared with predictions based on neo-classical models, even when developed capital markets exist. This reflects capital constraints, imperfect information and risk adverse behaviour on the part of firms, and is a reason why capitalization may be a misleading guide to market efficiency.

By our measure, the “best capital markets” in 1998 were in Switzerland and the United States, followed at some distance by Taipei,China; UK; Denmark; Sweden; Germany; Netherlands; Spain; France; Canada; Australia; and Hong Kong, China. Taipei,China ranked a surprising third, despite very small private debt markets. Classifying our results by legal origins, a striking feature is that countries with German/Scandinavian heritages have better capital markets than those with English origins – which contradicts the hypothesis of La Porta et al. concerning the competitive advantages of common law systems in terms of financial development. Although countries with common law systems have larger share markets, we consider good long-term private debt markets (and derivatives) as the litmus test for informational quality. Another salient feature (see Figure 3) is the strong concentration of countries at the bottom of the quality spectrum. Such enormous gaps between the best and the worst clearly indicate that reliable information is the critical barrier for developing capital markets (as opposed to banking).

III.5 “Global informational quality” of financial systems

III.5.1 Estimating a global indicator of informational quality

Table 6 below summarizes the country rankings for our index of global informational quality in 1998, along with its three sub-components, and per capita income and political obstacles. The global indicator is a weighted average of:

- the institutional–governance environment,
- the regulatory environment–structural strength of banking systems, and
- the functional quality of capital markets.

⁶¹ Taipei,China has one company for every 18 persons, the highest ratio in the world. SMEs represent more than 98% of all firms and account for 75-80% of employment. However, the β volatility of its stock market is twice that of the US, which (together with lax rules and enforcement on insider trading) lowers its attractiveness to foreign institutional investors. Moreover, excessive volatility raises concerns over the role of capitalization in assessing “functional capital market quality”, because high valuations can reflect financial disequilibria (e.g., Japan’s and East Asia’s asset price and property market bubbles).

⁶² Taipei,China’s sales tax on the issue of corporate bonds, which is akin to taxing inputs, has recently been lowered from 5% to 2%. However, this still represents 1/1,000 of the value of bond transactions and discourages the development of a secondary market. Brokerage commissions of .14% for trades <NT\$10 million and .10% > NT\$150 million also hampers market liquidity. Brokerage fees in Indonesia; Hong Kong, China; Malaysia; and Philippines appear even higher (see Mine and Rhee 2000).

⁶³ Equity (and bond) markets play an active role in financing investment requirements. In 1995, new equity issues were equal to 4.7% of GDP in Malaysia; 3.5% in Hong Kong, China; and 1.8% in Korea. The 1% figure for Taipei,China was the same as for the UK and US.

All three elements are essential to developing a vibrant financial system, especially if there are externalities. Our approach places a premium on institutional resilience and the capacity to adapt. Hence, just as in real life, there are constant pressures to adapt to new technologies, shocks and a rapidly changing competitive environment. The destiny of some countries is to be promoted to higher levels; others could be relegated, while still others are condemned to permanent third or fourth division status.

How should the three sub-indices be weighted to calculate a global index? One way is through simulating an econometric model to achieve specific policy goals (e.g., a Taylor rule). Unfortunately, no macroeconometric model embodies measures of “the informational quality of financial systems”; hence inspiration must be found elsewhere. Our global indicator assigns half the weight to capital markets as is assigned to the institutional-governance environment and the regulatory environment-structural strength of banks, (resulting in a weighting structure of 1: 2: 2)⁶⁴. This reflects the causal principles in the policy matrix, that the institutional environment and soundly regulated, good banks are the backbone of vibrant financial systems. Indeed, a good case could be made for even higher weights for social infrastructure. Nonetheless, on these weights the equity market represents some 4% of the global index, in line with empirical estimates of the wealth effect of share prices in US consumption functions⁶⁵. In sum, our global league standings are grouped into four divisions (see Figure 1 and Table 6) reflecting how financial institutions appear to evolve in relation to the quality of information (or transactions costs):

- *the première or elite division* is distinguished from the top of the second division by good long-term private debt (more than 50% of GDP of Switzerland and the US) and/or active derivatives markets (the UK and US);
- *a second division* (of potential challengers) is characterized by active commercial banking and share markets, but with less developed long-term private debt and/or interest derivatives markets⁶⁶;
- *a third division* has commercial banking established, but the share market plays a small role in resource allocation and monitoring of corporate activity⁶⁷; and

⁶⁴ To test for the sensitivity of different weighting schemes, the global index was recalculated using linear weights throughout. This increases variance between 1995-1998 as it triples the weight of the volatile share market. Apart from Taipei,China, which is ranked at an implausible 6th vs. 10th in 1998, the ranks of the other countries barely changed, although the gap between the best and worst widened.

⁶⁵ Effective share market turnover represented 4% of the average variation in the total index from 1995 to 1998. Wealth effects outside the US are likely to be smaller (see Boone et al. [OECD] 1998).

⁶⁶ Division II countries have effective stock market turnover greater than 50% and stock market capitalization more than 75% of GDP. Commercial banking dominates state-owned banks, with the latter accounting for less than 25-35% of total banking assets (except for Germany). This group includes Canada; Australia; Singapore; Hong Kong, China; Germany; Taipei,China; Japan; France; Netherlands; Spain; Chile; South Africa; Malaysia; Korea; Italy; Austria; Belgium; Ireland; New Zealand; and the Scandinavian countries. Despite a large private bond market, Germany is included here owing to its large state-owned banking sector.

⁶⁷ In Division III countries, state-owned banks play a larger role (35-50% of total deposits) in the banking sector, and new equity issues as a share of GDP are negligible. This group includes Philippines, Peru,

- *a fourth division* is marked by the state dominating the banking system, while capital markets are at early stages of development (PRC, Egypt, India, Indonesia, Jordan, Kenya, Nigeria, Pakistan, Russia, Sri Lanka, Turkey, and Zimbabwe).

Table 6:
Country Rankings, 1998

<i>Economy</i>	<i>Global Informational</i>	<i>Capital Markets</i>	<i>Institutional Gover'n Env.</i>	<i>Banking Systems</i>	<i>Political Obstacles</i>	<i>Per capita GDP (\$) PPP</i>
Argentina	30	35	31	25	34	29
Australia	5	10	6	5	7	12
Austria	26	23	21	30	26	8
Belgium	25	16	33	23	43	7
Brazil	39	32	47	39	46	39
Canada	4	13	5	2	5	6
Chile	22	25	26	9	13	23
China, People's Rep. of	47	29	43	49	53	47
Colombia	38	50	54	17	49	41
Czech Republic	34	38	34	31	50	28
Denmark	8	5	8	21	14	5
Ecuador	54	52	53	54	39	42
Egypt	51	43	37	53	43	48
Finland	14	18	11	13	11	18
France	15	12	19	11	5	10
Germany	11	7	17	15	22	13
Greece	35	22	38	38	47	25
Hong Kong, China	7	14	12	7	36	15
Hungary	33	33	34	31	50	34
India	41	28	29	51	17	53
Indonesia	53	40	50	52	43	49
Ireland	18	31	9	17	12	17
Israel	28	39	25	28	34	21
Italy	24	19	30	21	39	14
Japan	9	17	4	24	2	9
Jordan	42	44	39	42	39	45
Kenya	49	54	45	47	22	54
Korea	20	8	14	35	16	27
Malaysia	19	15	18	26	30	36
Mexico	40	41	49	37	47	32
Netherlands	13	9	13	20	9	11
New Zealand	17	20	22	10	26	20
Nigeria	50	53	44	50	18	55
Norway	21	26	7	29	9	3
Pakistan	45	36	40	46	15	52
Peru	31	46	41	8	36	46

Argentina, Israel, Hungary, Czech Republic, Thailand, Colombia, Venezuela, Poland, Saudi Arabia, Brazil, Uruguay, Mexico and Ecuador.

Table 6 continued: Country Rankings, 1998

<i>Economy</i>	<i>Global Informational</i>	<i>Capital Markets</i>	<i>Institutional Gover'n Env.</i>	<i>Banking Systems</i>	<i>Political Obstacles</i>	<i>Per Capita GDP (\$) PPP</i>
Philippines	27	34	28	19	26	44
Poland	36	45	32	40	50	37
Portugal	29	21	27	34	30	24
Russia	55	51	55	55	53	43
Saudi Arabia	44	42	51	36	53	30
Singapore	6	24	3	6	33	2
South Africa	23	27	24	12	30	35
Spain	16	11	23	14	22	22
Sri Lanka	46	48	42	44	42	51
Sweden	12	6	16	16	7	19
Switzerland	3	1	15	4	19	4
Taipei, China	10	3	10	27	4	26
Thailand	32	30	20	41	19	38
Turkey	52	37	52	48	38	40
United Kingdom	1	4	1	1	3	16
United States	2	2	2	3	1	1
Uruguay	43	55	36	43	22	31
Venezuela	37	49	46	31	21	33
Zimbabwe	48	47	48	45	26	50
Median						
English origin	24.5	27.5	21.9	24.5	20.9	29.7
French/Spanish	34.2	33.5	36.5	30.8	33.7	31.5
German	19.4	18.4	19.1	27.6	23.9	19.8
Scandinavian	13.8	13.8	10.5	19.8	10.3	11.3

Rankings not endorsed by ADB/I

IV. What Factors Characterize Global Informational Quality?

To put individual country rankings into perspective, what features characterize the best institutions and financial systems, as these could provide a guide for latecomers?

- Is a sound institutional-governance environment the essential element?
- Do countries have good institutions and financial systems because they are rich or vice versa?
- How important are “political obstacles” in determining outcomes?
- Is a universal banking system an efficient model for EMEs; if not can the best elements of Anglo-Saxon capital markets-based systems be copied?

A simple way of testing these hypotheses is via correlation analysis. Table 7 shows what proportion of informational quality for the 55 economies is correlated with its three sub-indices: capital markets, the institutional-governance environment, the regulatory environment—structural strength of banking systems, and per capita GDP and favourable

“politics”. Correlation does not imply causality, especially in the case of income levels (see below). Our results suggests that the institutional-governance environment (including enforcement), is by far the dominant factor determining global informational quality R^2 92.3%, while the regulatory environment and structural strength of banks, followed by capital markets are the next two most important variables. Capital markets are thus highly significant in influencing “informational quality”, despite the lowered weight assigned to share market prices.⁶⁸ Income levels are also significant [R^2 84.7%],⁶⁹ but along with “political obstacles” [R^2 64.1%] are at the bottom of the list.

In sum, our simple test suggests limited support for the thesis of La Porta et al. on the origins of legal systems. Enforcement as embodied in the institutional-governance environment appears to dominate the informational quality of financial systems. Moreover, institutions can evolve independently of enforcement (the influence of the institutional-governance environment is stronger than “enforcement” alone [R^2 92.3% vs. R^2 71%]). These observations support the view of R&Z that policy initiatives can overcome political obstacles and legal origins. Last, the similar results for the regulatory-environment-cum-banking systems and capital markets may reflect the fact that share markets can emerge even with surprisingly under-developed banking systems.

Table 7:
Cross-correlation Matrix, 1998

	Quality Ranking	Capital	Institut'n	Banking	Political	Per Capita
	1998	Markets	Gover'n Env	Systems	Obstacles	GDP (\$) PPP
Correlation	Column (1)	(2)	(3)	(4)	(5)	1998
Coefficients	Column (1)	(2)	(3)	(4)	(5)	(6)
with respect to						
Column (1)	100.0%					
(2)	87.1%	100.0%				
(3)	92.3%	81.4%	100.0%			
(4)	89.4%	67.0%	71.6%	100.0%		
(5)	64.1%	57.1%	72.9%	47.5%	100.0%	
(6)	84.7%	74.9%	77.4%	73.7%	45.9%	100.0%

⁶⁸ To test for bias from alternative weighting schemes, the same exercise was made on the linear version of the global informational index, which indicated virtually identical results.

⁶⁹ The R^2 between income (US\$ PPP based) and informational quality is high [R^2 75%] and similar to a simple proxy of legal systems. The main problem with assessing the role of institutions on income is reverse feedback or endogeneity effects, and is addressed through instrumental variables (see Annex I) that show powerful causal effects of informational quality on the level of per capita GDP.

IV.1 Are universal banking systems necessarily bad for EMEs?

Last, are some financial systems more efficient than others? There is no consensus on this issue because there is no a priori reason why a universal banking system (typically in countries with civil code legal systems) should be better or worse than capital markets-based financial systems^{70 71}. Hence, even though the latter group figures prominently in our first division, Denmark, Germany, Sweden and especially Switzerland are also quite well placed⁷². By most criteria - apart from Australia, Canada, UK and US – Hong Kong, China; Malaysia; Singapore; and Taipei, China also have capital-markets-based financial systems. But, for most of the Asian crisis economies, this distinction is irrelevant, because establishing these systems can be attained only in the longer-run. At first blush, the most common feature of capital markets-based systems is that they are virtually all former English-speaking colonies. This may, however, be misleading. If colonialism were so important, why do countries with German/Scandinavian legal origins have better capital markets? In sum, there is no magic bullet: different legal and institutional systems have strengths and weaknesses, and there are alternative routes to developing financial systems and economic prosperity. Thus, for the East Asian crisis economies, two issues appear important:

- making an objective strategic diagnosis of strengths and weaknesses, and
- gauging whether sufficient progress has been made towards a better financial paradigm more in line with the perspective stage of economic development.

IV.2 Benchmarking the East Asian crisis economies

A major advantage of a policy matrix is that it provides a transparent strategic diagnosis of a country's strengths and weaknesses compared with its peers and over time. In fact, East Asia has made significant, albeit modest, progress in structural reform since 1997. However, the difficult analytical question is whether this is sufficient to sustain buoyant medium-term output growth? Better institutions are always welcome, but they also entail economic and political costs. Hence, progress needs to be assessed *vis-à-vis* a realistic "institutional benchmark" appropriate to actual or perspective stages of development. Judging whether specific benchmarks are "appropriate" is fraught with

⁷⁰ Information and transactions cost theory suggests that financial systems may follow an evolutionary path. With limited information, state-run banking usually dominates followed by the emergence of commercial banking. The equity market is the next institution to emerge, even when banking systems are comparatively under-developed. By contrast, the informational needs (in terms of impersonalized information and long-term contracting capabilities) for long-term private-debt and interest derivatives markets are very demanding, and are empirically the last markets to emerge.

⁷¹ Interestingly, US banks, which until recently had been restricted from functioning as universal banks domestically, often carried out related financial operations through affiliated companies. By contrast, in their overseas operations, which are exempt from such regulations, they often offer universal banking services.

⁷² There are no rules on the classification of financial systems; hence, two simple criteria were used. The ratio of effective stock market turnover and long-term private debt must exceed the ratio of bank credit to qualify as capital market-based financial systems. A minimum effective stock market turnover rate of 75% is also used as a cut off (because some countries meet the first criteria as their banking systems have imploded).

difficulties, because institutions will evolve over time and in relation to various stages of economic development (cf. Figure 1). Moreover, “benchmarks” may shift in response to large discrete shocks and changes in reputational regimes.

Simple “benchmark” estimates of informational quality are presented for illustrative purposes in Figure 2. (These can be interpreted as the average statistical reading for “quality” based on our 55-country sample, controlling for the level of Informational Quality of Financial Systems (IQFS) and per capita GDP.) Our estimates for informational quality “benchmarks” are in the spirit of the estimates by Hall and Jones (H&J) (1999) that control for possible endogeneity, and appear to be well identified and robust (t values ranging from 7 to 9). They should not, however, be interpreted as necessarily implying causality.

This approach consists of a standard growth accounting exercise to explain the level of labour productivity by capital intensity, human capital and technical change. The second step explains the role of social infrastructure in labour productivity. For step two, H&J construct a social infrastructure (SI) variable consisting of the ICRG data set, plus a variable to capture the extent to which a country is open to international trade (suggested by Sachs and Warner [1995]). In fact, the latter variable is not without controversy, as it implies strong unconditional convergence via trade liberalization (see Ahn et al. 2000, p. 48). Our estimates in Annex I reproduce H&J’s results for our 55-country sample as a baseline. This equation was then re-estimated substituting our “informational quality index” for their SI variable in Ordinary Least Square (OLS) and Two Stage Least Square (2SLS). The instrumental variables approach depends, importantly, on the assumption that the instruments are highly correlated with the independent variable, but uncorrelated with the error terms. If these exogenous variables were related with current output per worker, the only plausible channel could arguably be through their influence on the SI variable. After controlling for possible endogeneity, H&J estimates show a strong bivariate relation between social infrastructure and the level of per capita GDP. 2SLS estimates using our index of “informational quality” are also highly significant and improve the statistical characteristics of the estimating equation compared with the baseline.

Notwithstanding their simplicity, benchmarks can help make objective evaluations to the query:

- Have post-1997 improvements in informational quality in Indonesia, Korea, Malaysia, Philippines and Thailand (given their actual stage of economic development) been sufficient to forestall another financial crisis in the near term?

Our benchmark can be interpreted in the following manner. In general, countries appear to gravitate towards a supply-side determined benchmark, plus or minus an error margin depending on its “reputation” for good economic management and geo-political factors. Being substantially *below* this margin implies that the level of GDP is higher than warranted relative to its social-informational infrastructure and may imply potential systemic downside risks. Indeed, countries that perpetually under-perform their benchmarks dominate the lower quadrants of Figure 2, and are characterized by deeply flawed governance systems, recurring economic crises and/or stagnation (Brazil, Indonesia, Mexico, Pakistan, Russia, Sri Lanka, Turkey, Venezuela, etc.) (Norway and Saudi Arabia are clear outliers owing to large resource rents). By contrast, economies

substantially above their benchmarks (Malaysia; Taipei,China; UK) can be seen as investing in their future or as under-achievers if this situation persists.

According to our illustrative benchmarks, Korea, Malaysia, Philippines and Thailand, but not Indonesia, had made adequate progress in improving their informational institutions by end-1998. This positive evaluation has several caveats. These estimates may vary according to estimation techniques. Moreover, the international climate in early 2001 is far harsher than late 1998, implying that stronger efforts in structural reform may be needed to convince risk-averse “informed investors” that the political will is there to continue.

Last, how should one assess calls for East Asia to upgrade its social infrastructure to, say, Swiss standards? A benchmark differs radically from Utopia. Thus, using world-class standards of social infrastructure as “benchmarks” when Indonesian and Korean per capita GDP levels are 10% and 50%, respectively, that of Switzerland’s is simply ludicrous – quite apart from the time and cost that such reforms would take. At the same time, notwithstanding progress to date, there is no room for complacency. It is important for Korea, Malaysia, Philippines and Thailand to accord much higher priority to structural reform to definitively prevent a repeat of the 1997 events. But a sensible balance between the costs and benefits of reform also needs to be struck. By contrast, measures to radically improve Indonesia’s social infrastructure are urgently needed.

V. Summary, Conclusions and Directions for Future Research

Policy matrices facilitate transparent strategic diagnoses and peer comparisons among EMEs...

This paper presents cardinal estimates of the “informational quality” of financial systems for 34 EMEs (13 of which are in Asia) and 21 OECD countries, based on 27 microeconomic-cum-institutional indicators arrayed in a policy matrix. A characteristic of this matrix is that a functional hierarchy – whereby higher-level institutions (the institutional-governance environment) impose greater constraints on lower level behaviour than vice versa – classes these indicators. Our estimates are circa 1995-1998, although highly preliminary figures are presented for 1985. Notwithstanding efforts to standardize data sources, these indicators are subject to error. Hence, small inter-temporal or inter-country differences should be treated with caution. The prime goal of an indicators approach is to help policy analysts make strategic diagnoses of the informational quality and structural strength of financial systems. Individual data series or functional groupings of indicators for 27 EMEs can thus be analyzed over time and/or relative to selected comparators, with similar cultural backgrounds and per capita GDP levels, as well as being benchmarked to the 55-country sample. A near-term priority for future research is to capture the experience of other low-income EMEs. Such an enriched database could provide better insight into the essential role of financial systems in economic growth – and hence poverty reduction – as well as pragmatic insights into policy sequencing. Increasing the range of policy variables to include other indicators, such as securities and exchange regulations, corporate governance and trade barriers, subsidies, etc., is a medium-term goal of the research agenda.

...they are also a catalyst for research into key policy issues...

A related goal of our analytical database is the insights it will provide in answering policy analytic questions such as:

- What insights does information theory provide on what went right – and what went wrong – in East Asia in 1997-1998?
- How much progress in structural and institutional reform has been made by the East Asian crisis economies post-1997?
- Is the hypothesis of La Porta et al. that the origins of legal systems are a critical factor in determining the level of economic development supported by the data?
- Has sufficient structural reform been achieved to forestall another financial crisis in the foreseeable future, thereby permitting East Asia to grow its way out of its NPL problem?

These are difficult questions. Hence, the conclusions presented below are preliminary and will be enriched by further empirical research.

East-Asia's weak institutions and financial systems were sheltered by slow financial deregulation and closed capital accounts until the 1990s...

What went right and what went wrong in East Asia in 1997-1998 is an unresolved controversy. This paper argues that the East Asian “miracle” for more than three decades can be explained by textbook neo-classical growth theory based on very strong economic fundamentals, and the exploitation of comparative advantage, factor price equalization and learning by doing. However, a vexing question is: how did East Asia attain such high, sustained economic growth despite poor institutions and financial systems, and why are institutions now apparently so important? Our hypothesis is that weak institutions were effectively sheltered by slow financial market deregulation and closed capital accounts. Moreover, “informed international investors” used credit rationing schemes based on portfolio diversification models, rather than country-specific risk profiles given the high fixed costs of information. Hence, so long as *regional* growth was sustained, the cardinal sins of poor bank lending and weak institutions were largely absolved by high nominal economic growth and capital inflows.

...financial deregulation was badly executed, and weak institutions failed to adapt to a harsher environment

The crux of the problem is that this “golden period” of strong growth was not used to upgrade weak institutions to weather the much harsher, volatile environment of globalized financial markets in the 1990s. In short, East Asia failed to learn the basic policy lesson from financial crises in other countries – that upgraded prudential standards are a necessary condition for successful financial market deregulation. Worse, when serious financial deregulation began in the 1990s, not only were prudential standards lax, but also capital account liberalization was perverse; favouring short-term over long-term capital flows. Given the hubris of unending economic growth, this array

of structural fault lines led to massive (effectively) unhedged short-term capital inflows, excessive levels of company leveraging, rapid credit growth, asset price inflation and high systemic risk.

A series of shocks shifted the behaviour of “informed international investors”, with devastating consequences

In the event, the regional shocks that hit East Asia in 1997 provoked an abrupt “regime shift” as “informed international investors” radically altered their credit allocation decisions from evaluating regional risk to speculating on how other “informed investors” would behave. Indeed, the abrupt reversal in net lending of international banks towards late 1997 is the only plausible explanation for the virulence of the ensuing financial collapse, as massive short-term capital outflows exacerbated the downward spiral in financial markets and imploding exchange rates. Notwithstanding a strong economic rebound in 1999-2000, financial markets in the East Asian crisis economies remained fragile in early 2001, perhaps implying that “informed investors” now place a higher premium on structural reform and improving institutions. In sum, informational economics underscores the high cost and risks of regime shifts (or multiple equilibria), in the face of large fixed costs and poor informational quality – and hence the *raison d’être* for better transparency in the current policy debate. Future research will attempt to identify factors affecting regime shifts, and their implications for capital flows and appropriate financial paradigms for EMEs in Asia.

Modest, although significant, progress has been made in structural reform in the aftermath of the crisis...

Virtually all of the East Asian crisis economies have made significant efforts since 1997 to improve ineffective bankruptcy procedures, revamp weak regulatory frameworks, recapitalize devastated banking systems, establish asset management funds to deal with NPLs, and raise accountancy standards and tighten disclosure rules (Korea and the Philippines making substantial progress, see Table 3 above)⁷³. However, as this was a global trend, their relative positions improved less. More worrying, the post-1997 sense of urgency with which such reform was pursued in the crisis economies (and elsewhere in Asia) appears to be waning. In fact, our estimates for global informational quality rank the Asian crisis economies at average to below-average levels in 1998 (Malaysia 19th, Korea 20th, Philippines 27th, Thailand 32nd, Indonesia 53rd), which are often below their Latin American peers with lower income levels (e.g., Chile 22nd and Peru 31st [see Figure 2 below]), indicating no room for complacency.

...raising the question of the importance of the origins of legal systems as opposed to enforcement

⁷³ However, other countries continue to lag. According to the 1998/1999 summary ICRG measure, India, Indonesia and Pakistan still lag in many of the categories that “explain” a sound institutional-governance environment, although financial systems in these countries remain largely insulated by capital controls. By contrast, basic legal reform appears to have made headway in the PRC in the 1990s (cf. Table 3).

Against this background of modest progress in structural reform, how important are the origins of legal systems as opposed to legal enforcement in improving the quality of institutions? According to the highly influential studies of La Porta et al. (1998, 1999), the origins of legal systems have important long-lasting effects on the quality of legal, and hence social, infrastructure. Indeed, they claim that English common law systems are inherently more libertarian and adaptable than civil code legal systems and that they should have a competitive advantage in encouraging better institutions and economic growth. If their hypotheses are correct, the implications for Asia's struggling economies with civil code systems could be profound (Indonesia; Japan; Korea; Philippines; Taipei, China; but not, Hong Kong, China; Malaysia; Singapore; and Thailand). Decades (if not a century) of root and branch legal reform might be needed to establish "appropriate" common law legal systems, quite apart from the implications for alternative forms of governments.

...our study emphasizes enforcement and multiple routes to improving legal systems, institutions and governance

The preliminary results of our study imply that the latter contention of La Porta et al. has mixed support from our 55-country sample and that their conclusions need greater nuance. Indeed, La Porta et al. themselves point out that enforcement of legal systems is best among the Scandinavian countries; and countries with Germanic civil codes are, in fact, indistinguishable from those with an English common law heritage. (However, the observation that the 22-French/Spanish/Portuguese countries with a civil code heritage always have the weakest legal systems and thus poorest capital markets is supported.) Indeed, the 12 economies with a Scandinavian/Germanic legal heritage (Austria; Czech Republic; Germany; Hungary; Japan; Korea; Switzerland; and Taipei, China) actually have much better long-term private debt and capital markets than the 18 common law economies in our sample (although common law countries have far larger share markets). These differences are important because long-term private debt markets demand high standards of "informational quality" and are a litmus test for the operational quality of financial institutions. Last, in contradiction to the hypothesis of La Porta et al., Scandinavian/Germanic countries have unweighted per capita PPP GDP levels almost one third higher than countries with English common law systems (cf. Tables 3 and 5).

In sum, our findings suggest that legal origins are important, but that greater nuance is needed in interpreting their impact on economic development. Indeed, there may be many routes to improving institutions, better functioning legal systems and governance, and better enforcement appears to be more important than legal origins *per se*. Preliminary empirical tests (taking into consideration problems of endogeneity and errors in variables, see Annex I) confirm that social infrastructure and our index of informational quality have robust effects on the level of economic development. Future research should assess the statistical significance of the origins of legal systems, rule of law, legal enforcement, and the role of other indicators of social infrastructure in determining informational quality and the evolution of financial systems. These results are likely to be improved by an expansion of the database to include a larger sample of EMEs.

...can East Asia grow its way out of its NPL problems?

A critical policy question is whether sufficient progress has been made in improving East Asia's institutional-governance environment since late 1997 to allow Asia to "grow its way out of its NPL problems", especially given its need for foreign investment and volatile shifts in foreign investor attitudes. Against this backdrop, actual progress in structural reform needs to be assessed against an "appropriate" benchmark of institutional informational quality. A simple way of calculating such a benchmark is shown in Figure 2 below and illustrates the "average level" of quality in our 55-country sample, associated with different levels of informational quality and per capita PPP GDP in 1998. Using this benchmark, all the East Asian crisis economies – with the notable exception of Indonesia, which is in a high-risk zone – had made adequate progress by end-1998 to forestall another financial crisis. (These benchmarks also illustrate that persistent under-achievers are typically countries with deeply flawed governance systems and characterized by recurring economic crises or stagnation.)

...with the exception of Indonesia, the answer is a qualified yes, but there is no room for complacency

This positive assessment carries important caveats. Benchmark estimates may vary following large discrete shocks, and there may be thresholds or non-linear effects that are difficult to estimate (cf. Figure 1). Indeed, since late 1998, persistently high sovereign risk premia appear to indicate that EMEs are being judged by far tougher criteria and that they probably need to "over-achieve" for a time, to establish credibility among "informed investors" concerning their commitment to long-term reform. Hence, a major problem appears to be the perception that the sense of political urgency with which reform was pursued in East Asia in 1997-1998 has waned. Thus, even though top priority must be given to improving prudential supervision and banking systems in the next five years or so, far higher priority is also needed in pursuing institutional and structural reform to lay the longer-term foundations for better capital markets, and to avoid a repetition of the 1997 crisis. Future research will test alternative theories of economic growth to improve these benchmark estimates, as well as integrating the quantitative role of financial intermediation and informational quality.

...the pay-offs from structural reform are large and non-linear

A key feature of structural reform is its potential for large non-linear pay-offs. Thus, if a typical economy has a capital output ratio of 3:1, and institutional reform leads to a mere 2% improvement in the efficiency of capital allocation, this is equivalent to a gain of some 6% of GDP in terms of foregone consumption. Given the stringent fiscal constraints that the poorest EMEs in Asia face in raising capital intensity and/or the level of human capital via better education, health care and gender equality, institutional reform is an attractive alternative indeed.

...but reform is slow in EMEs owing to poor information and “politics” ...

Given such large potential economic benefits, why is reform not pursued more vigorously? The answer is a lack of transparent information, and as R&Z put it, “politics”. In most EMEs, reliable information concerning the state of institutions is non-existent or hard to obtain, while the costs and welfare benefits of structural reform are virtually unknown subjects in the public debate. Even though structural-institutional reform yields disproportionate economic benefits, these accrue to the community as a whole; thus powerful special interest groups benefiting from the status quo are well positioned to perpetually delay or dilute reform through “relations” or to buy off their most vocal critics. Reform also requires considerable time to yield results, and thus puts a high premium on political vision, resolve and perseverance. Thus, quite apart from the policy insights that future empirical research will yield, one of the definitive advantages of our policy matrix would be to put a “transparent score card system” into the public policy debate. Greater transparency should encourage not only better empirical and policy analysis, but also greater probity concerning domestic social-political issues based on peer comparisons and ultimately greater political accountability in EMEs.

Immediate priority must be given to improving prudential supervision and the banking sector

In conclusion, world financial markets have experienced an unprecedented degree of turmoil since East Asia’s 1997 financial crisis and Russia’s 1998 debt default. Similar shocks and volatility are inevitable in the future. The challenge for Asia’s economies is to resist the inevitable political pressures to insulate themselves from change and to adapt more flexibly and quickly to a rapidly changing external environment. This will require establishing better financial paradigms that are not only more appropriate to actual and perspective stages of development but can also harness the enormous potential benefits of new technologies and globalization, while maintaining an appropriate degree of financial stability. A necessary near-term condition for this is the upgrading of prudential supervision standards and establishing viable commercial banks.

But structural and institutional reform needs far higher longer-term priority

A credible start has been made in the East Asian crisis economies since late 1997 in revamping basic legal structures, improving enforcement, and raising accounting and disclosure standards. However, the gaps between enforcement and formal rules are still large. Although the priorities over the next five years or so must centre on developing market-oriented banking systems, far higher priority should also be accorded to longer-term structural and institutional reforms. The potential benefits of reforms are disproportionately large, as they would help to underwrite sustained higher growth in Asian EMEs, as well as to establish better capital markets. The difficulties in implementing this agenda should not be under-estimated. The process will require time, considerable resources, courage and discipline, as well as the emergence of new qualities such as greater imagination and a larger individual appetite for risk. Finally,

our paper suggests that the international environment has probably changed irrevocably since 1997-1998. To paraphrase Darwin: change inevitably involves risk; however, it is not the strongest or the most intelligent that survive and prosper, but those most adaptive to change. Since the late 1980s, the most successful examples of the evolution towards resilient dynamic financial systems have been countries pursuing free market principles.

Annex I

The *IQFS* Indicator and Cross-Country Regressions

This annex presents cross-country regressions using our indicator of the “Informational Quality of Financial Systems” (IQFS), following a methodology proposed by Hall and Jones (1999) (henceforth, H&J). Our estimates show that the IQFS “explains” differences in the level of per capita income in our smaller sample of 55 countries quite well. They also suggest that the potential explanatory power of an IQFS indicator could be quite large if the database could be enlarged to include a wider cross-section of country experience.

Background

The growing body of empirical literature using indicators of the “quality of governance” or more generally, some measure of “social capital” in cross-country regressions, is indicative of the information value of an indicators approach⁷⁴. Various indicators have been used to capture social, political and institutional factors as potential determinants of economic growth. The work by H&J (1999) is frequently cited, as their estimates show that much of the difference in long-run economic performance across countries can be explained by the quality of social infrastructure.

One of the most difficult issues in cross-country regression studies is the potential endogeneity of explanatory variables. For example, findings from cross-country regressions that measures of “social infrastructure” have a strong positive correlation with the level of national income could be easily challenged, because well developed “social infrastructure” might be a result — rather than a cause — of economic development. Another serious problem with an indicators approach is that some subjective components of the indicator could be indirectly affected by the knowledge of income levels. H&J explicitly address both the endogeneity and error in variables problems by using instrumental variables.

Main elements of Hall and Jones’ methodology

Social infrastructure (SI) indicator

As a simple measure of “social infrastructure”, H&J use a simple average of two indicators: one is a widely used index of government anti-diversion policies (GADP) and the other is the Sachs-Warner (1995) (hereafter S&W) openness index. This GADP variable is an equally weighted average of five variables: (i) law and order, (ii) bureaucratic quality, (iii) corruption, (iv) risk of expropriation, and (v) government repudiation of contracts. This GADP index is scaled from zero to one. Their version of the S&W index is the fraction of years when the economy was “open” during the period (1950-1994). S&W define openness considering: (i) non-tariff barriers, (ii) average

⁷⁴ For further discussions on the relation between “social capital” and economic growth, see Ahn and Hemmings (2000).

tariff rates, (iii) black market exchange rate premia; (iv) existence of a socialist regime, and (v) state monopolies in major exports.

Instrumental variables

An ideal instrumental variable should be highly correlated with the SI indicator but uncorrelated with the unknown random components that directly affect output per worker. For instruments, H&J use four exogenous variables: (i) distance from the equator, (ii) the trade share estimated from a “gravity equation” by Frankel and Romer (1999), (iii) the fraction of English-speaking population, and (iv) the fraction of population speaking a European language. The influence of Western European culture on the evolution of social infrastructure is proxied by these four linguistic and geographic variables. If these exogenous variables were related with current output per worker, the only plausible channel could arguably be through their influence on social infrastructure.

H&J’s findings

H&J find that their SI indicator had positive and statistically significant coefficients. Interestingly, the coefficient of the Two Stage Least Square (2SLS) regression using the aforementioned four instruments was even bigger than that of the Ordinary Least Square (OLS) regression. Based on such results, they conclude that differences in social infrastructure across countries cause large differences in income and that such findings are robust to potential measurement errors and endogeneity concerns.

Our regressions

Methods

The construction of our IQFS indicator is described in Part III of the body of this paper. Our regression results follow H&J by using the same equations and instrumental variables. To maximize transparency we reproduce H&J regression results with their original data set (**A** and **B** in Table A1 for their 127-country sample). We then replace their independent and explanatory variables (“1988 output per worker” and “SI indicator”) with our “purchasing power parity [PPP] adjusted 1998 per capita GDP” and “1998 IQFS indicator”.

Table A1: Regression Results

	Dependent Variable	Explanatory Variable	Estimation Method	Estimated Coefficient (t-ratio)	Number of Countries	R-squared
<i>Hall and Jones (1999) with original data set (N=127)</i>						
A	Output per worker (1988)	SI indicator	OLS	3.29 (13.18)	127	0.58
B	Output per worker (1988)	SI indicator	2SLS	5.14 (10.97)	127	0.40
<i>Hall and Jones with reduced data set (N=55)</i>						
C	Output per worker (1988)	SI indicator	OLS	2.47 (8.45)	55	0.57
D	Output per worker (1988)	SI indicator	2SLS	3.81 (6.74)	55	0.40
<i>Our regressions with reduced data set (N=55)</i>						
E	Per capita GDP PPP adjusted (1998)	IQFS indicator	OLS	3.39 (9.23)	55	0.62
F	Per capita GDP PPP adjusted (1998)	IQFS indicator	2SLS	4.34 (7.41)	55	0.57

As the IQFS indicator covers 55 countries, we reproduce H&J's regressions for this reduced sample (**C** and **D**). As would be expected, the regression coefficients decline somewhat (owing to the fewer number of observations) but remain positive and statistically significant. Hence, H&J's main conclusions are unaffected by a smaller sample. Lines **E** and **F** of Table A1 show the results using our IQFS indicator. One feature is that the coefficients for our IQFS indicator are larger and better identified than those for the SI indicator in both the OLS regression and 2SLS regression. These results could be further improved as the database is enlarged. More important, our preliminary regression results suggest that differences in "informational quality of financial systems" can explain a substantial part of the differences in income across countries, even after controlling for potential measurement errors and endogeneity concerns.

Fig. 1: Global Indicator of Informational Quality by Groups, 1998

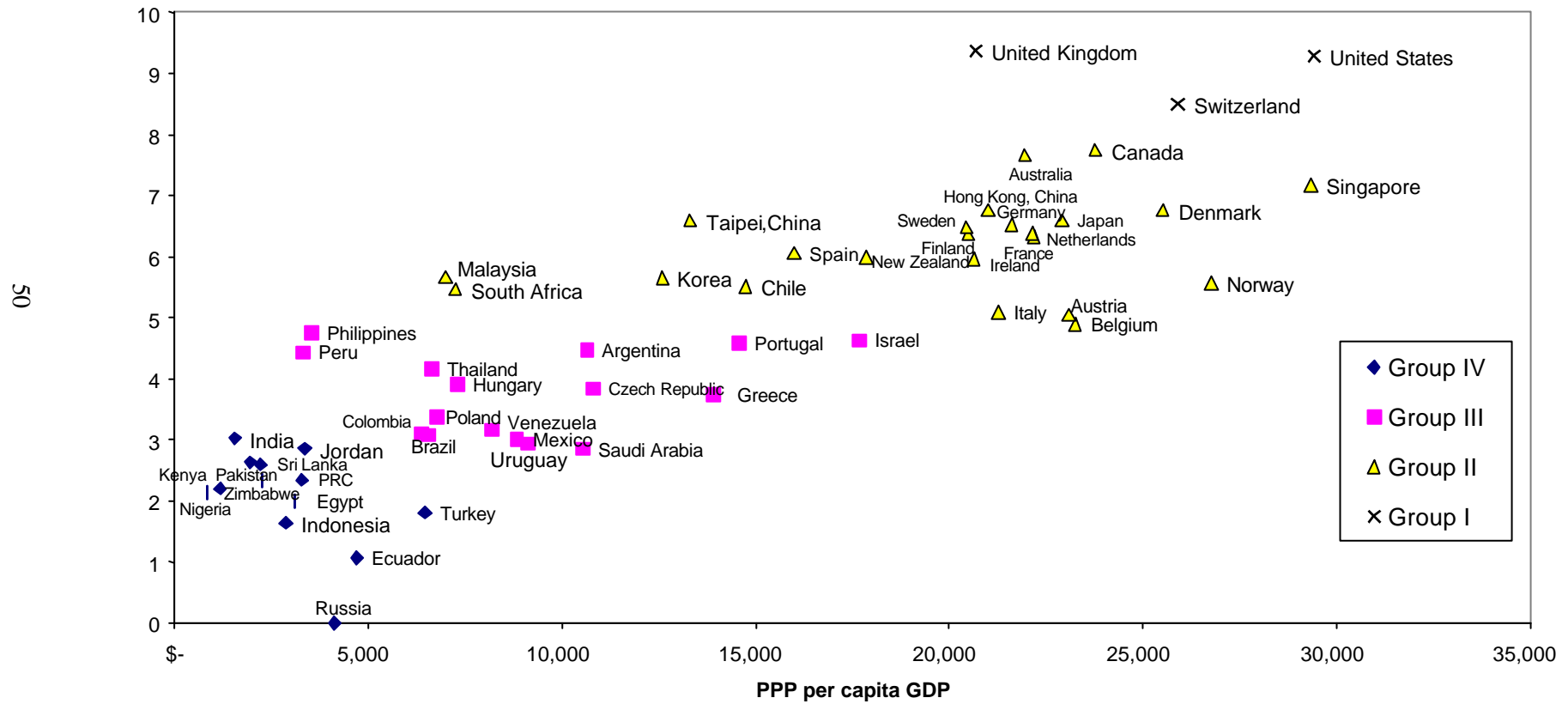


Fig. 2: Global Indicator of Informational Quality, 1998

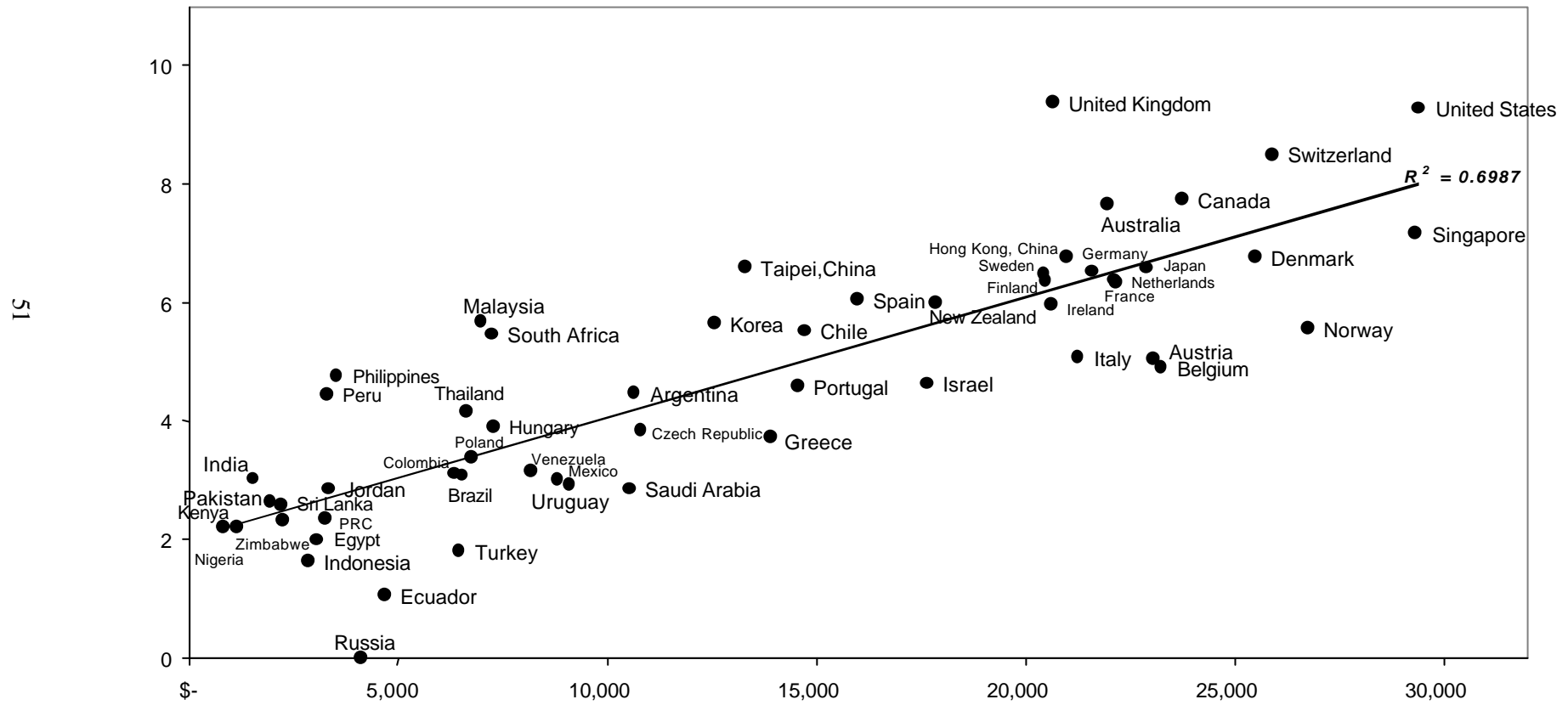


Fig. 3: Functional Quality of Capital Markets, 1998

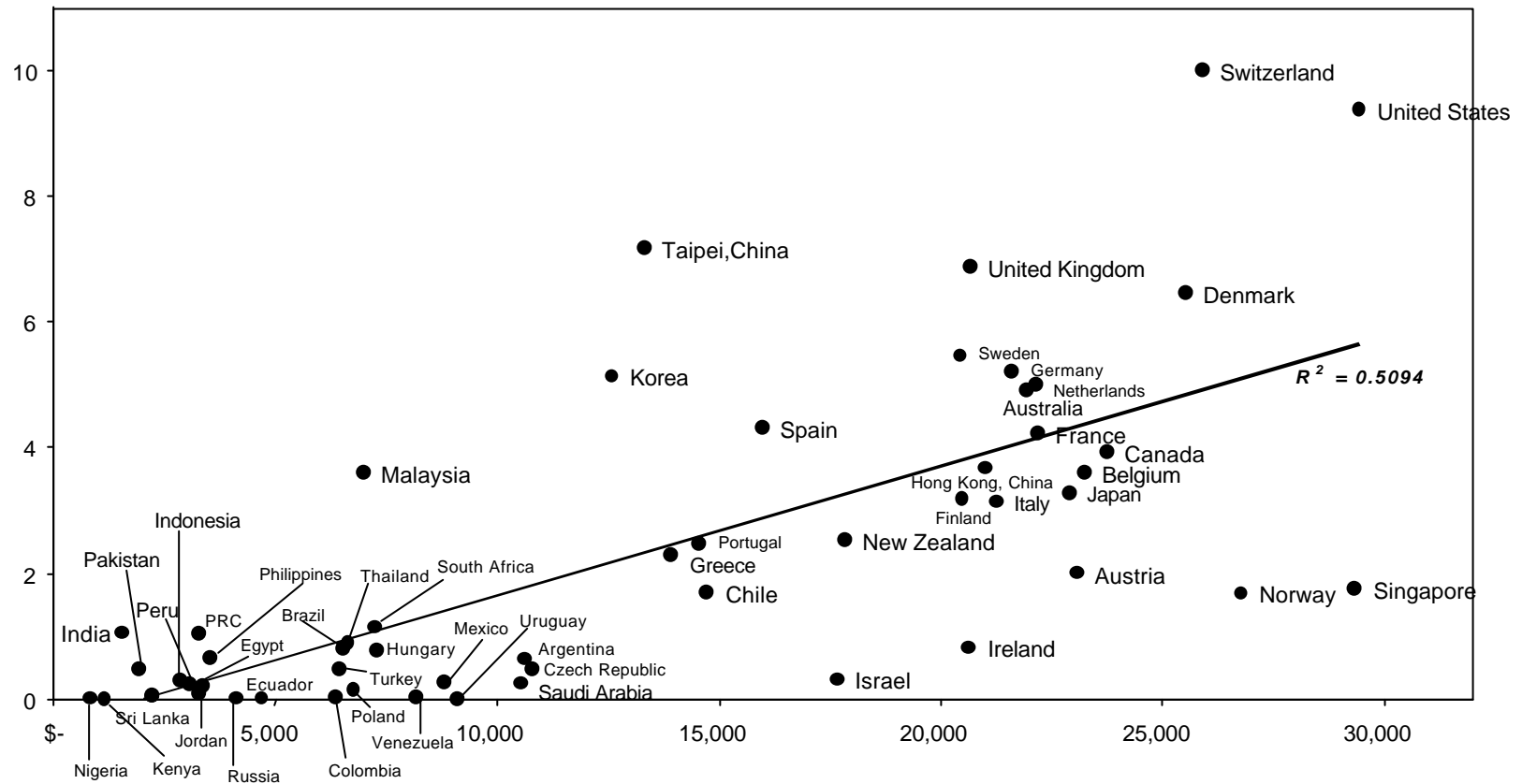


Fig. 4: Institutional and Governance Environment, 1998

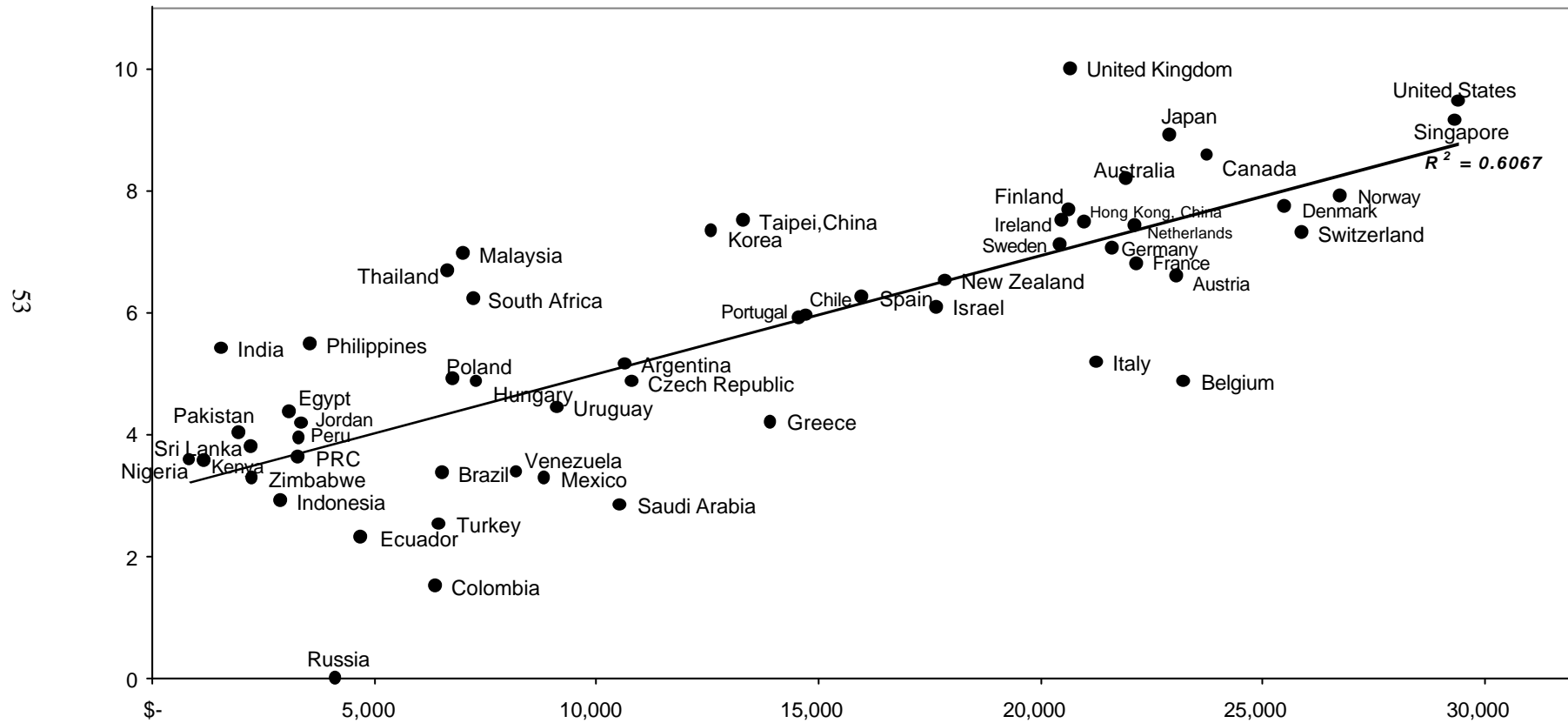
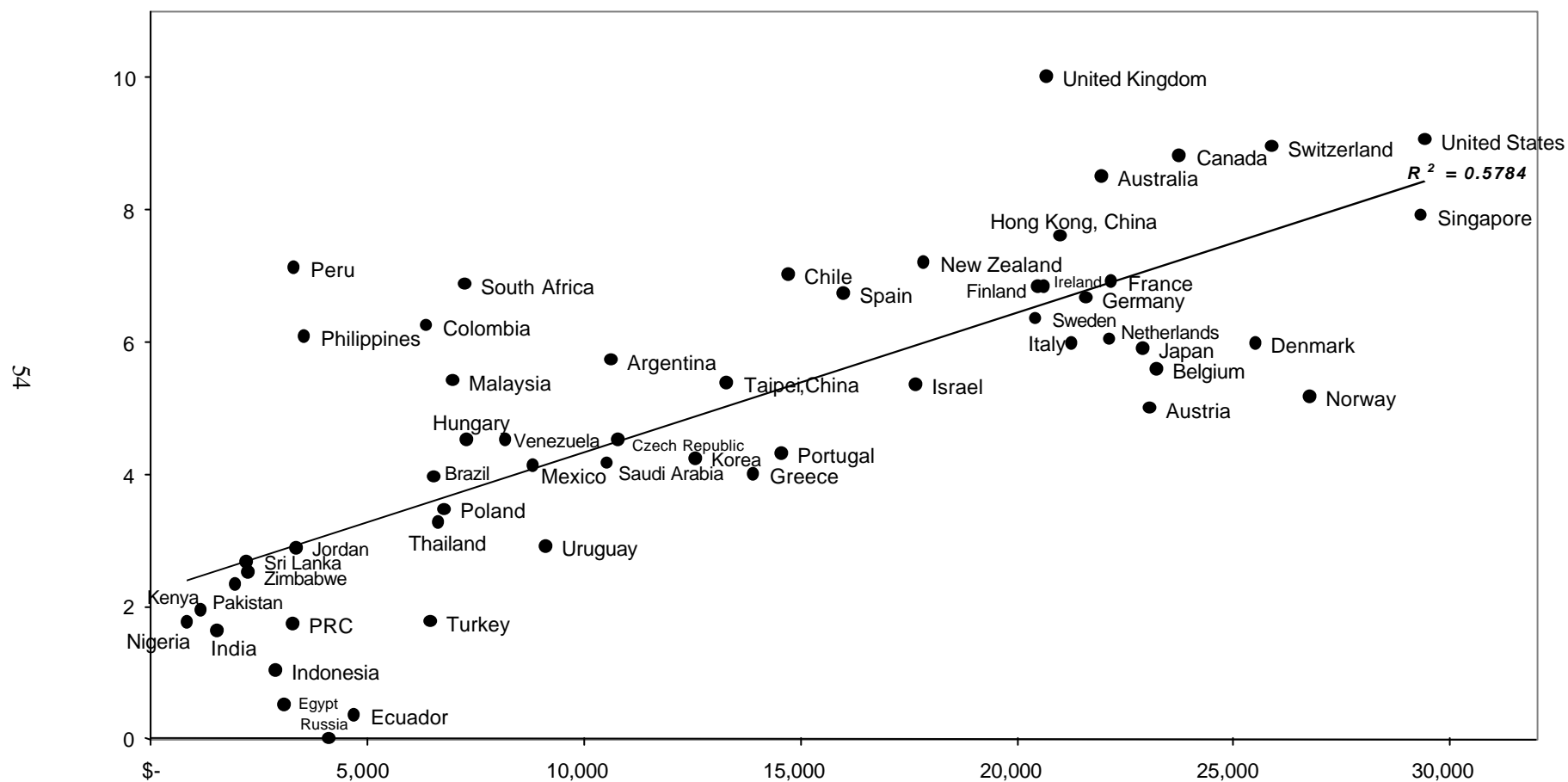


Fig. 5: The Regulatory Environment and Structural Strength of Banks, 1998



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