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Capital Account Liberalization and Economic Performance: Survey and Synthesis

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This paper surveys the literature on the effects of capital account openness and stock market liberalization on economic growth and provides a synthesis in which we reconcile some of the different results presented in the literature. Various empirical measures used to gauge the presence of controls on capital account transactions and the liberalization of equity markets are discussed. We compare detailed measures of capital account controls that attempt to capture the intensity of enforcement with other indicators that simply capture whether controls are present. A detailed review of the literature is followed by an empirical section in which we trace the divergence in published results to differences in country coverage, sample periods, indicators of liberalization, and control variables across studies. Specifically, we show that when an institutional variable such as government reputation is added to the specification, the significance of capital account openness vanishes. Also, we demonstrate that enriching the specification by allowing for nonlinearities helps explain why different studies that ignore the nonlinear nature of the relationship find different results. [JEL F32, F33, F36]

Economic theory suggests that unfettered international capital flows can foster a more efficient allocation of resources, provide opportunities for risk diver-

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sification, and help promote financial development. In recognition of these potential benefits, governments of industrial countries have undertaken widespread capital account liberalization over the past quarter-century. Many attribute efficiency gains, increased diversification opportunities, and financial development in these countries to opening up capital markets.

A natural policy prescription, therefore, is to extend this process of international financial integration to other, economically less developed, countries.[1] But this view has been quite controversial. Some argue that, while capital account liberalization is desirable, it is important to proceed slowly.[2] Others question the desirability of unfettered capital flows regardless of the liberalization process on the grounds that unregulated capital flows could facilitate the occurrence and spread of currency crises.[3] Given the potential importance of countries' policies on capital account liberalization and the different lessons one might draw based on which articles one reads in this expanding literature, it seems an opportune time to review the evidence.

One source of the debate on the role of capital account liberalization is the mixed set of empirical results derived in the literature. A possible reason for this ambiguity arises from the fact that different studies have applied different empirical measures, reflecting the difficulty in identifying and quantifying capital account liberalization in a consistent manner across a wide set of countries. In Section I of this survey, we describe a range of different measures of capital account openness. We also demonstrate that the two measures that have been most widely used in studies of the effects of capital account liberalization on growth, one that attempts to capture the intensity of controls and another that merely records their presence, paint a roughly similar picture of the state of capital account controls.

While the correlation across these two measures may not strike one as surprising, we show in our review of the literature in Section II that studies employing the indicator that attempts to capture the intensity with which controls are imposed tend to be more supportive of the effect of open capital accounts on growth than those that employ an indicator of the presence or absence of controls. One might suspect that this is because of the fact that indicators reflecting intensity are more informative than ones that merely record the presence or absence of controls. This conclusion, however, ignores the fact that studies vary widely along several dimensions, including the time period and country coverage of the sample, as well as the econometric technique employed.

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[1]The benefits of open capital markets were stressed by Lawrence Summers in his 2000 Richard T. Ely Lecture to the American Economic Association when he said ". . . to the extent that international financial integration represents an improvement in financial intermediation, . . . [perhaps] because institutions involved in the transfer of capital across jurisdictions improve efficiency with which capital is allocated, it offers a potentially significant increase in economic efficiency" (p. 3).

[2]For example, in the *Report of the Managing Director to the International Monetary and Financial Committee on Progress in Strengthening the Architecture of the International Financial System and Reform of the IMF* (IMF, September 19, 2000; available via the Internet at: *http://www.imf.org/external/np/omd/2000/02/report.htm*) it is written, "In a number of discussions in recent years on issues related to capital account issues, the Executive Board has emphasized the substantial benefits of capital account liberalization, but stressed the need to carefully manage and sequence liberalization in order to minimize risks."

[3]In an influential article in *Foreign Affairs,* Bhagwati (1998, p. 7) argued that "substantial gains [from capital account liberalization] have been asserted, not demonstrated. . . ."

In an effort to assess the reasons for the different conclusions obtained across studies, we present, in Section III, a series of regressions in which we use a common data set and a common set of "nuisance" regressors to focus on the role played by the sample and the type of capital account openness indicator in generating diverse results. We are able to replicate the basic result, with respect to the significance of capital account openness and stock market liberalization on growth, presented in five published studies by mimicking the country coverage, time period studied, and indicator of capital account openness employed in these research papers.

The purpose of Section III, however, is not replication but cross-study comparison. We show that all the specifications in which there is a significant effect of capital account openness on economic growth founder on the same shoal. Rodrik (1998) suggests that capital account openness may only serve as a proxy for the reputation of a government. Indeed, when he includes both an indicator of capital account openness and a measure of government reputation in a growth regression, the coefficient on the latter is positive and highly significant, while the coefficient on the former is not at all significant. We show that this criticism holds for samples with different time periods and country coverage than those considered by Rodrik as well as for regressions that employ other indicators of capital account openness or stock market liberalization.

We also present evidence in Section III supporting the hypothesis that capital account openness and stock market liberalization might have a positive effect on some countries' growth, even when we control for government reputation. Following Klein (2003), we use a specification in which there is a quadratic interaction between income per capita and capital account openness or stock market liberalization. Replicating his results, we demonstrate that there is a positive and significant effect of capital account openness and stock market liberalization on economic growth for middle-income countries but not for poor or rich countries. This result is consistent with the view that poorer countries do not have the legal, social, and political institutions necessary to fully enjoy the benefits of capital account liberalization.

We conclude, in Section IV, with the lessons we have drawn from our survey and synthesis, as well as our suggestions for further research on this timely and important topic.

I. Measures of Capital Account Restrictions

A natural starting point for any data-based discussion of the consequences of capital account openness and stock market liberalization on growth is a review of different empirical measures that have been employed to gauge whether a country allows the free flow of financial capital across its borders. In practice, there are few indicators of capital account restrictions available across a wide cross section of countries. Most measures are qualitative and rules-based, though there has been some attempt to go beyond an on/off categorization by reflecting the intensity with which controls are imposed.

In this section, we discuss in detail the two capital account restriction measures used widely in studies of the growth effects of financial liberalization. Both of these measures draw on data assembled by the IMF and published annually

since 1950 in its *Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER).* We compare these two measures both with each other and with some other measures of capital account openness. Then we present some alternative methods of dating stock market liberalization and highlight other quantitative measures of capital account liberalization.

Table 1 summarizes the measures of capital account liberalization and stock market liberalizations. This summary table facilitates the comparison of the indicators discussed in this section. Each row of this table corresponds to one of the indicators. The first column presents the name of the indicator that we will use in our discussion of growth determinants. The second column provides the source of the indicator, referring either to an article where the indicator is first presented or to a publication that describes the construction of the indicator. Columns 3 through 6 briefly describe the indicator, the range of values the indicator takes, the years covered, and the countries covered by the indicator.

Indicators of Capital Account Openness

Every issue of the International Monetary Fund's *Annual Report on Exchange Arrangements and Exchange Restrictions* published between 1967 (which refers to conditions in 1966) and 1996 (which refers to conditions in 1995) includes a summary table in which a single row directly addresses the presence of capital controls, line E.2, labeled "Restrictions on payments for capital transactions."[4] The information in this row has been the basis for generating an indicator of the existence of rules or restrictions that inhibit cross-border capital flows or discriminate on the basis of citizenship or residence of transacting agents (Table 1, row 1).

Share measure

A standard way to use the information from line E.2 of the International Monetary Fund's *Annual Report on Exchange Arrangements and Exchange Restrictions* is to construct, for each country, a variable reflecting the proportion of years in which countries had liberalized capital accounts. We call this variable *Share* (Table 1, row 2).[5] For example, if the *AREAER* judged capital markets open for 5 years out of a 10-year period, then the openness measure *Share* would be 0.5.

A potential problem with this approach is that a value of *Share* equal to 0.5 is consistent with a situation where a country had open capital markets for the first five years of a decade, for the last five years of a decade, for every other year of a

[4]The set of categories that reflect the presence of capital controls expanded with the 1997 issue of *Annual Report on Exchange Arrangements and Exchange Restrictions* with the specification of 13 categories including, for the first time, a distinction between restrictions on inflows and restrictions on outflows. Unfortunately, this modification of the classification system introduces a structural break in the measure, since the two classification methodologies (one entry versus 13 entries) cannot easily be mapped onto each other. We do not discuss the expanded categorization in the post-1996 *AREAER,* since we know of no research on capital account liberalization that has used data spanning these two classification systems.

[5]The first work to employ such a data set—and generate a publicly available electronic version—was Grilli and Milesi-Ferretti (1995). Other research using such measures includes Rodrik (1998) and Klein and Olivei (1999).

Table 1. Summary of Indicators of Restrictions

Name	Source	Description	Range	Years	Country Coverage
1. IMF	IMF *AREAER,* line E.2, various issues	Constructed as an on/off indicator of the existence of rules/restrictions that inhibit cross-border flows.	0 (always restricted) or 1 (never restricted)	1966–95, after which format changes	117 countries for years 1976–85 to 137 countries for years 1986–95
2. *Share*	*AREAER,* line E.2, various issues	Uses IMF measure to create proportion of years that capital account is judged free of restrictions. Can be constructed for any range, 1966–95.	0 (always restricted) to 1 (never restricted)	1966–95, after which format change	117 (1976–95) to 137 (1986–95)
3. *Quinn*	Quinn (1997)	Constructed from narrative descriptions in *AREAER* regarding capital account restrictions.	Larger numbers mean less restricted, more open, or meet agreements. Values in ½ point increments, 0–4	Full sample: 1958, 1973, 1982, and 1988	63 countries, of which 20 are advanced and 43 are developing
4. Δ*Quinn*	Quinn (1997)	Change in Quinn indicators.	Actual ranges for capital account 1988–82; –1 to 2 1988–73; –2 to 2	Construct from dates above	63 countries, of which 20 are advanced and 43 are developing
5. *OECD—Share*	*Code of Liberalization of Capital Movements*	Proportion of the 11 categories free of restrictions, averaged over the relevant period.	0 (always restricted) to 1 (never restricted)	1986, 1988, 1990, 1993, 1995	21 OECD countries
6. *MR*	Montiel and Reinhart (1999)	Measures the intensity of capital account restrictions.	0 (unrestricted) 1 (mild restrictions) 2 (severe restrictions)	1990–96	15 emerging markets

7. Levine/Zervos and Henry	Levine and Zervos (1998); Henry (2000a and b)	Dates of stock market liberalizations in emerging markets.	Constructed as 0/1 dummies for event studies or share of years open for cross section.	Earliest: May 86 Latest: Dec. 91	11 emerging markets
8. *BHL*	Bekaert, Harvey, and Lundblad, (2001)	Dates of stock market liberalizations in emerging markets and industrial economies.	Constructed as 0/1 dummies for event studies or as share of years open for cross section.	Earliest: 1980; Latest: 1997	95 countries. 43 had some experience with financial liberalization (25 emerging market, 18 OECD)
9. *EW*	Edison and Warnock (2003)	One minus the ratio of the IFC investable index to the IFC global index.	Constructed to be between 0 and 1.	Earliest: 1988 to present	29 emerging markets
10. CapFlows	Kraay (1998)	Measure based on actual capital flows.	Constructed as percentage of GDP.		All countries with Balance of Payments Statistics
11. CapStocks	Lane and Milesi-Ferretti (2001)	Measure based on accumulated or stock of gross capital flows.	Constructed as percentage of GDP.	Earliest: 1970–98	70 countries, mix of advanced and developing

decade, or for many other on-again, off-again patterns. In practice, however, as shown in Panel A of Table 2 (Klein and Olivei, 1999), there are very few instances of on-again, off-again capital account controls, at least for the 10-year period that ends in 1995, the last year in which capital account liberalization reflects the entry in a single line of the *AREAER*. Thus, over the period 1986 to 1995, a country with a value of *Share* equal to 0.1 had an open capital account in 1995 only, a country with a value of *Share* equal to 0.2 had an open capital account in 1994 and 1995, and so on. This pattern holds for all industrial countries and for 10 of the 12 developing countries that had some experience with open capital accounts during this period. Panel B of this table shows that this correspondence between the value of *Share* and the number of continuous years of open capital accounts continues to hold for industrial countries as the sample period is extended back to 1976. But, in

Table 2. IMF Capital Account Restriction Measure

A. Value of *Share* and Years When Capital Markets Open, 1986–95
(For countries that had open markets at some point in time, i.e., *Share* ≠ 0)

Proportion of Years	Years Open	Industrial Countries	Developing Countries
0.1	1995	Norway	Costa Rica, Niger
0.2	1994–95	Spain	Trinidad & Tobago
0.3	1993–95	Portugal, Sweden	Honduras, Peru
0.4	1992–95	Ireland	
0.5	1991–95	Finland, Austria	
0.6	1990–95	France, Italy	
	1988–92, 1995		Ecuador
0.7	1989–95		Guatemala
	1986–92		Uruguay
0.8	1988–95	Denmark	
1.0	1986–95	Australia, Belgium, Canada, Japan, Netherlands, New Zealand, United Kingdom, United States	Bolivia, Indonesia, Malaysia, Panama

B. The Evolution of Capital Account Restrictions, 1976–85
(For countries that had open markets at some point during this period)

Years Open	Industrial Countries	Years Open	Developing Countries
1984–85	Australia, New Zealand	1980–81	Costa Rica
1978–85	Japan, United Kingdom	1976–79	Guatemala, Honduras
		1976–84	Ecuador
1976–85	Belgium, Canada, Germany, Netherlands, United States	1976–85	Indonesia, Malaysia

Sources: IMF, *AREAER;* and Klein and Olivei (1999).

this longer sample period, there are many more cases of on-again, off-again capital account liberalization among developing countries.

Quinn's measure

The on/off indicator of capital controls presented in the summary table of the *Annual Report on Exchange Arrangements and Exchange Restrictions* described above does not distinguish between strongly administered capital controls and those that are somewhat more porous. Quinn (1997) attempts to capture the intensity of enforcement of controls on both the capital account and the current account through a careful reading of the narrative descriptions in the *AREAER* (Table 1, row 3).[6]

We limit our discussion to Quinn's measures of capital account liberalization.[7] He scores the intensity of controls for capital account receipts and capital account payments separately. For each of these two categories, a score of 0 indicates payments are forbidden, 0.5 indicates that there are quantitative or other regulatory restrictions, 1 indicates that transactions are subject to heavy taxes, 1.5 indicates that there are less severe taxes, and 2 indicates that transactions are free of restrictions or taxes. The sum of the values for the two categories is an indicator of overall capital account openness that ranges between 0 and 4. These indicators are available annually from 1950–97 for 21 Organization for Economic Cooperation and Development (OECD) countries and for the years 1958, 1973, 1982, and 1988 for 43 non-OECD countries.

A glance at Quinn's data set indicates that the overall trend toward liberalization is mostly driven by the OECD countries. Table 3 presents a tabulation of Quinn's measure of capital account liberalization for 1973, 1982, and 1988, years for which these indicators are available for all countries. The top panel of this table presents the data for the full set of 63 countries, while the lower panel presents the data for the 42 non-OECD countries only. The data in the first set of columns of these tables show that, in 1973, 37 of 63 countries, including 26 of the 42 developing countries, had capital account indicators equal to the mid-range (2) or lower. The overall trend toward greater capital account liberalization is reflected in the fact that, from 1973 to 1988, the total number of countries with capital account indicators equal to 2 or lower decreased to 33. But this overall trend hides significant heterogeneity: over the same period the number of developing countries with a score of 2 or lower actually increased to 32.

As discussed in more detail below, Quinn (1997) uses the change in the value of the indicator of capital account restrictions rather than its level in his growth regressions (Table 1, row 4). The last three columns of each of the two panels in Table 3 uncover interesting patterns in the churning of the capital account liberalization experience. While most OECD countries (18 out of 21) increased their degree of liberalization between 1973 and 1988, the developing countries were almost equally

[6]Two people separately assigned scores based on their readings of the narrative descriptions, and then these scores were checked for discrepancies.

[7]Quinn also scores the intensity of controls for two categories that are related to current account restrictions and another category called international legal agreements.

Table 3. Quinn's Indicators of Capital Account Liberalization

Number of Overall Countries

Indicator Value	1973	1982	1988	With No Change in Value 1973–88	With Increase in Value 1973–88	With Decrease in Value 1973–88
0 (restricted)	2	1	0	0	2	—
0.5	4	5	3	1	3	0
1.0	11	9	7	4	6	1
1.5	13	15	14	6	6	1
2.0	7	13	9	0	6	1
2.5	7	4	6	2	4	1
3.0	9	7	11	2	4	3
3.5	5	0	4	0	2	3
4.0 (liberalized)	5	9	9	3	—	2
TOTAL	63	63	63	18	33	12

Number of Developing (Non-OECD) Countries

Indicator Value	1973	1982	1988	With No Change in Value 1973–88	With Increase in Value 1973–88	With Decrease in Value 1973–88
0 (restricted)	2	1	0	0	2	—
0.5	4	5	3	1	6	0
1.0	10	8	7	4	5	1
1.5	9	14	13	6	2	1
2.0	1	8	9	0	0	1
2.5	5	1	3	2	2	1
3.0	4	0	2	0	1	3
3.5	3	0	2	0	0	3
4.0 (liberalized)	4	5	3	2	—	2
TOTAL	42	42	42	15	15	12

Sources: Quinn (1997) and authors' calculations.

split between those that increased it (15 countries), reduced it (12), or kept it unchanged (15). Note also that by the end of the 1980s, developing countries had converged toward an intermediate level of liberalization; developing countries that had a relatively low level of liberalization in 1973 tended toward an increase in this measure, while the opposite held for those developing countries with a relatively high degree of liberalization in 1973.

Quinn's capital account restriction indicators are meant to be used as cardinal numbers, and, therefore, there is the implication that a country in category 2 is literally twice as unfettered as one in category 1, or a change in the value of the indicator of 1 is exactly twice the amount of liberalization as a change in the indicator of 0.5. For comparison purposes, however, the question arises of how to convert

Quinn's measure into a (0,1) dummy; that is, how to identify which value of Quinn's scale would correspond to a threshold for classifying countries as open or closed.

Table 4 suggests that the correspondence between Quinn's multiple-measures and the 0/1 *AREAER* measure is approximately achieved if one chooses a threshold of 2 in Quinn's scale. Each of the six panels in this table offers a tabulation of the number of countries that have capital accounts classified as 0 (closed) or 1 (open) by the *AREAER* and are given values of capital account restrictions of 0–2 (more closed) or 2.5–4 (more open) by Quinn. There are three panels for the full sample and three for developing countries, with one pair for each of the more recent years for which Quinn has data for all countries, 1973, 1982, and 1988. A high correspondence between the *AREAER* and Quinn measures would be reflected in relatively large diagonal elements of the 2×2 matrix and relatively small off-diagonal elements. In fact, more than 80 percent of the countries in the full sample and more than 90 percent of the countries in the developing countries sample fall into one of the diagonal cells for each of the three years. For the full sample, there are few cases where the *AREAER* indicates open capital accounts while Quinn indicates closed capital accounts (that is, it is rare to find a relatively large number in the upper-right

Table 4. Comparison of Quinn and IMF Indicators
(Number of countries for each combination of indicators)

Panel 1: Full Sample: Year 1973

		IMF Indicator		
		0	1	Total
Quinn	0–2	36	0	36
Indicator	2.5–4	10	15	25
Total		46	15	61

Panel 2: Full Sample: Year 1982

		IMF Indicator		
		0	1	Total
Quinn	0–2	38	4	42
Indicator	2.5–4	7	12	19
Total		45	16	61

Panel 3: Full Sample: Year 1988

		IMF Indicator		
		0	1	Total
Quinn	0–2	32	0	32
Indicator	2.5–4	12	17	29
Total		44	17	61

Panel 4: Developing Countries: Year 1973

		IMF Indicator		
		0	1	Total
Quinn	0–2	26	0	26
Indicator	2.5–4	4	12	16
Total		30	12	42

Panel 5: Developing Countries: Year 1982

		IMF Indicator		
		0	1	Total
Quinn	0–2	32	4	36
Indicator	2.5–4	0	6	6
Total		32	10	42

Panel 6: Developing Countries: Year 1988

		IMF Indicator		
		0	1	Total
Quinn	0–2	32	0	32
Indicator	2.5–4	2	8	10
Total		34	8	42

Source: Authors' calculations.

cell of the 2 × 2 matrix). Most of the discrepancies between the two indicators are cases where the *AREAER* indicates closed capital accounts and Quinn gives a value of 2.5, 3, 3.5, or 4. A more detailed presentation would show that almost all the cases of non-zero entries in the lower-left cell represent a value of 2.5 or 3 assigned by Quinn.

Thus, there seems to be quite a high correspondence between Quinn's measures and those of the *AREAER,* when one chooses a threshold of 2 in Quinn's scale in order to classify a country's capital account as closed or open. The relevant question is whether the gradations presented by Quinn offer significant information, a point we return to below.

OECD Code of Liberalization of Capital Movements

An alternative measure of capital account liberalization, one available only for OECD member countries, is provided in various issues of the *Code of Liberalization of Capital Movements* published by the OECD about every other year (Table 1, row 5).[8] Each volume of the *Code of Liberalization of Capital Movements* offers data on the extent to which restrictions contemporaneously apply on a range of types of international transactions, including direct investment, liquidation of direct investment, admission of securities to capital markets, buying and selling of securities, buying and selling of collective investment securities, operations in real estate, financial credits and loans, and personal capital movements. The OECD also specifies whether the restrictions apply to commercial banks and other credit institutions, and to institutional investors.

In all, the *Code of Liberalization of Capital Movements* reports on whether there are restrictions on 11 categories of capital account transactions. Klein and Olivei (1999) construct a variable that represents the proportion of these 11 categories that are free of restrictions, averaged over time. Thus, this variable (like the *Share* variable described above) potentially ranges from 0 to 1 over the sample period but (unlike *Share*) its value for any one country in any year can take a value between 0 and 1 in increments of 1/11. For the period 1986 to 1995, the four largest values for this variable are 0.89 (Germany), 0.92 (United States), 0.92 (Netherlands), and 0.93 (United Kingdom), while two countries have values below one-half, Greece (0.49) and Portugal (0.43). The correlation between this measure and the IMF *Share* measure using the single annual 0/1 measures drawn from *AREAER* is 0.86.

Montiel-Reinhart intensity measure

In a series of papers, Montiel and Reinhart develop and use an alternative measure of intensity of controls on international transactions based on annual information for 15 countries (Argentina, Brazil, Chile, Colombia, Costa Rica, Czech Republic, Egypt, Indonesia, Kenya, Malaysia, Mexico, Philippines, Sri Lanka, Thailand, and Uganda) for the period 1990–96.[9] This indicator ranges from 0 to 2, and, unlike

[8]Between 1986 and 1995, these volumes were published in March 1986, March 1988, November 1990, June 1993, and June 1995.

[9]See, for example, Montiel (1996), and Montiel and Reinhart (1999).

the measures previously discussed, a higher number represents stronger capital account restrictions. In particular, a value of 0 for a particular country in a particular year represents a situation where "no restrictions or taxes were imposed on capital inflows and no restrictions on the domestic indebtedness of domestic financial institutions were in place that appeared to be in excess of commonly used prudential measure."[10] A value of 1 represents restrictions that take the form of "overzealous prudential regulations (such as strict limits on the foreign exchange exposure of banks)" while a value of 2 indicates "the existence of explicit measures, such as prohibitions, deposit requirements, or financial transaction taxes, designed to limit capital flows" (Table 1, row 6). The choice of assigning a value of 0, 1, or 2 for a particular country in a particular year is based on information provided in the annual report of that country's central bank.

Each of the 15 countries in their sample begins with a value of 0 for the capital control proxy in 1990. Ten countries retain a value of 0 throughout the 1990–96 period, and five countries end the period with a value of 2. More to the point for this discussion, the only instance of an intermediate value of 1 is for Colombia in 1991 and 1992, after which it switches to 2 for 1993–96. Thus, their effort to distinguish between the intensity of capital controls does not really yield many cases where "mild" capital controls are in place. In particular, were these data used to construct "shares" over the period 1990–96, there would be little difference between using the range of values 0, 1, and 2, or using only 0 and 1.[11]

Indicators of Stock Market Liberalization

Several papers have focused on the liberalization of controls on the international sale or purchase of equities. Research in this area has typically focused on dating the opening of equity markets to foreign investors. Levine and Zervos (1998) and Henry (2000a, 2000b), who extended this work, have compiled dates from a variety of sources, including *The Wilson Directory of Emerging Market Funds,* the International Finance Corporation (IFC) Investable Indexes, various issues of *The Economist Intelligence Unit,* and the IMF's *AREAER.* For instance, for each of the 11 countries in his sample, Henry uses the dates reflecting official policy decrees as the first date in which a country fund is available, or a 10-percentage point jump in the IFC Investable Index (Table 1, row 7).[12]

Bekaert (1995) and Bekaert and Harvey (1995) also determine dates when equity markets in emerging economies opened to foreign investors based on a variety of indicators, including Official Liberalization Dates, the date of the introduction of American Depository Receipts, the date of the introduction of country funds, and

[10] All the quotes in this paragraph are from Montiel and Reinhart (1999, notes to Table 3, p. 628).

[11] Montiel and Reinhart also provide a "sterilization index" that is scored 0, 1, or 2 and that has many more cases of intermediate values than does the capital control proxy.

[12] For a description of his method, see the discussion on page 533 of Henry (2000a). Table I in this paper (p. 534) lists the dates and Table II compares these dates with those used by other authors. This paper is available on his web page, which also contains a document that lists major policy events, drawn from various issues of the *Economist Intelligence Unit's Quarterly Economic Report,* "Appendix 1: Chronological Listing of Major Policy Events in Developing Countries." Available via the Internet at: *http://faculty-gsb.stanford.edu/henry/personal/homepage.htm.*

a date estimated through a regime-switching model based on the time series of net U.S. capital flows (see Table 1 in Bekaert and Harvey, 2000). The number of countries covered is extended in a paper by these two authors and Lundblad (2001) to 95 countries, 16 of which had liberalized stock markets over the full period 1980 to 1997 and 27 of which had some experience with stock market liberalizations over this period. (See their Appendix Table A1; these dates are referred to in our Table 1, row 8.)

Table 5 presents the dates of "Official International Financial Liberalization" for the 30 countries classified as either emerging markets or frontier markets by the International Finance Corporation, as reported by Bekaert, Harvey, and Lundblad (2001). Note that, in comparing the entries in this table with the entries in Table 2, only Indonesia and Malaysia had both equity market liberalization and capital account liberalization (as reported by the IMF in the *AREAER*), and equity market liberalization followed capital account liberalization for both of these countries.

A recent study by Edison and Warnock (2003) provides a new measure of restrictions on foreign ownership of domestic equities, which shows the intensity of controls at a point in time as well as their evolution over time. The measure, discussed in full detail in their article and used in cross-sectional work of Ahearne, Griever, and Warnock (2004), builds on the work of the International Finance Corporation. In particular, for 29 emerging and frontier market economies, the IFC publishes two indexes of equity prices, the Global (IFCG) and Investable (IFCI) indexes. Since the IFCI index is composed of IFCG stocks minus the portion not available to foreigners, the ratio of the market capitalizations of the IFCI to IFCG

Table 5. Dates of Equity Market Liberalization of Emerging Market or Frontier Market Countries

Country	Liberalization Date	Country	Liberalization Date
Argentina	1989	Malaysia	1988
Bangladesh	NL	Mexico	1989
Brazil	1991	Morocco	1997
Chile	1992	Nigeria	1995
Colombia	1991	Pakistan	1991
Côte d'Ivoire	NL	Philippines	1991
Egypt	1997	Portugal	1986
Greece	1987	Sri Lanka	1992
India	1992	South Africa	1992
Indonesia	1989	Thailand	1987
Israel	1996	Trinidad and Tobago	NL
Jamaica	NL	Tunisia	NL
Jordan	1995	Turkey	1989
Kenya	NL	Venezuela	1990
Korea	1992	Zimbabwe	1993

Source: Bekaert, Harvey, and Lundblad (2001).

Notes: Countries classified as emerging or frontier by the International Finance Corporation; NL: Not Liberalized.

indexes is a measure of the availability of a country's stocks to foreigners, and one minus the ratio is a measure of foreign ownership restrictions (Table 1, row 9). This measure can be seen as an extension of the liberalization analysis of Bekaert and Harvey (2000) and Henry (2000a). Indeed, the initial relaxation of controls shown by the Edison-Warnock measure corresponds quite well with the Bekaert-Harvey liberalization date.[13] This new measure provides additional information, giving an indication of the extent of the liberalization and its evolution over time. It shows that international financial liberalizations can be gradual—a point also made in Bekaert and Harvey (1995).

Quantitative Measures

An alternative to the practice discussed above, of constructing indicators from published regulations, is to derive quantitative measures of the limits placed on capital account transactions from the values of economic variables. There are three different sets of variables that researchers have considered in this vein: national saving rates paired with national investment rates, interest rate differentials, and international capital flows. While at first blush it may seem preferable to use actual performance rather than published regulations to gauge the restrictiveness of capital controls, we will see that, as with rules-based measures, there are conceptual and practical challenges associated with the use of these quantitative measures.

To the best of our knowledge, neither a comparison of national saving rates with national investment rates nor interest rate differentials has been used in studying the effects of capital account liberalization on long-run economic growth. There have been some recent efforts to use actual capital flows to estimate the effects of capital account restrictiveness on growth. Despite the limited use of these measures in analyzing the links between capital account liberalization and growth, we discuss each of these three sets of measures, since they have been used to gauge the extent of capital account restrictions across countries and across time periods.

Feldstein and Horioka (1980) published a study that was quite influential, in part because it was one of the first efforts to measure quantitatively the extent of capital mobility across a broad range of countries. They analyzed the behavior of savings and investment in a number of countries to measure the "true" degree of capital mobility, arguing that the degree of correlation between the two series was a good indicator of impediments to capital movements. In any particular year, savings matches investment in a country with stringent capital account restrictions, while there need not be a link between savings and investment in a country with free capital mobility. Feldstein and Horioka found that, over the period 1960–74, as well as over the three five-year subperiods making up this 15-year period, average saving rates and average investment rates were highly positively correlated. Based on this finding, they concluded that there were significant impediments to capital movements.[14] But this conclusion has been criticized, since the saving and investment

[13] The liberalization dates in Henry (2000a) are somewhat earlier for some emerging markets, primarily those for which country funds existed in the mid-1980s.

[14] Montiel (1996) used the Feldstein-Horioka method to assess capital mobility by using results of the industrial countries as a benchmark to assess the degree of capital mobility for emerging markets.

rates of a country may be highly correlated, even if that country has no restrictions on international capital flows.[15]

Another set of quantitative measures of capital mobility includes onshore-offshore interest rate differentials and deviations from covered interest rate parity. Unlike stock market returns or other quantitative measures, short-term interest rates can be analyzed without first transforming them in model-specific ways. However, data availability restricts this method to a limited number of countries.

Recently, efforts have been made to gauge the extent of capital mobility through the use of actual capital inflows and outflows, either as a percentage of GDP (as used by Kraay, 1998, Table 1, row 10) or as in Lane and Milesi-Ferretti (2001), by using an annual measure of portfolio and direct investment assets and liabilities as a percentage of GDP as a long-run indicator of financial openness (see IMF, 2001; Chanda, 2001; O'Donnell, 2001; and Edison and others, 2002, Table 1, row 11). These measures are analogous to measures of trade openness and can be thought of in a similar manner. For example, like the level of trade openness, which is typically calculated as the sum of imports and exports over GDP, the Lane and Milesi-Ferretti measure is a good indicator of openness at a point in time. But both the Lane and Milesi-Ferretti measure, and that of Kraay, may fluctuate from year to year, since capital flows are endogenous and there can be large valuation adjustments as a result of, say, a large swing in equity values (Eichengreen, 2001). However, changes in these measures over longer periods are likely to be indicative of changes in openness. In the subsequent section, this stock measure will be referred to as the openness measure.[16]

Comparisons of Rules-Based and Quantitative Measures of Capital Account Liberalization[17]

Figure 1 highlights the relationship between measures of capital account restrictiveness based on rules and one based on capital flows. Specifically, this figure shows the time-series behavior of a rule-based measure, related to the restrictions on capital flows as reported to the IMF by national authorities, and a measure of capital account openness based on the estimated stocks of gross foreign assets and liabilities as a ratio of GDP.

In industrial countries, the behavior of the two measures is similar and confirms that these countries have become considerably more open over time. A particularly rapid decline in controls occurred during the 1980s, when the members

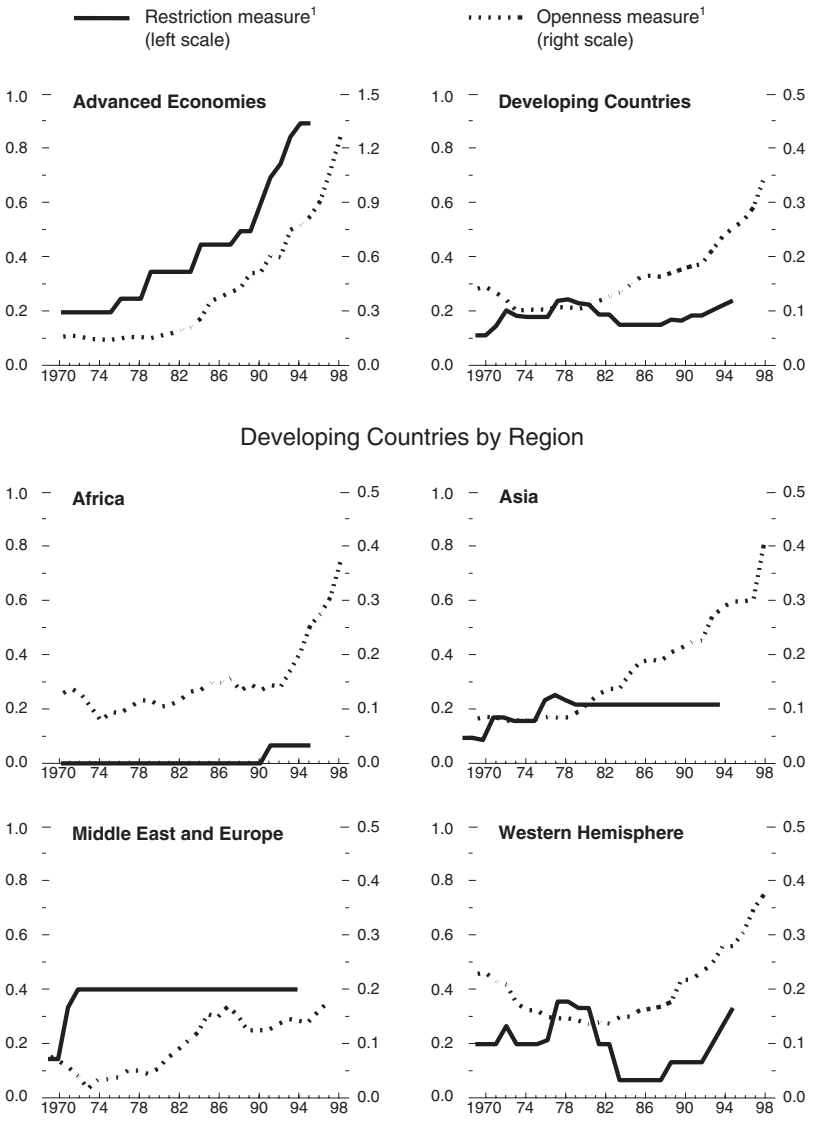
[15]For example, Obstfeld (1986) showed that, even with perfect capital mobility, saving and investment might be highly correlated just because of the types of shocks hitting an economy. He also demonstrated that the saving-investment correlations were higher for large countries than for small countries, a result one would expect to find if there was free capital mobility and outcomes in large countries influencing worldwide economic conditions. A different criticism of Feldstein and Horioka's conclusions concerning the extent of capital mobility based on saving-investment correlations comes from Bayoumi (1990), who shows that this correlation may just reflect efforts by governments to target the current account.

[16]Clearly, this openness measure does not just capture the restrictiveness of capital controls, but also the impact of all other factors influencing the level of capital flows, such as the nature of domestic financial markets.

[17]Parts of this section are adapted from the IMF's October 2001 *World Economic Outlook.*

Figure 1. Summary of Measures of Capital Account Openness

The two measures of liberalization show similar overall patterns, but the openness measure points to greater progress in the 1990s.



Sources: *Annual Report on Exchange Arrangements and Exchange Restrictions* various issues; *International Financial Statistics*; and IMF staff calculations.
[1]The restriction measure is calculated as the "average" value of the on/off measure for the country group. The openness measure is calculated as the average stock of accumulated capital flows (as percent of GDP) in a country group.

of the European Community (now called the European Union) liberalized capital controls. Following this, there was a dramatic rise in cross-border capital flows. Among industrial countries, Canada, the Netherlands, Switzerland, and the United Kingdom appear to have the most unfettered international capital flows, based on the estimated stocks of gross foreign assets and liabilities as a percentage of national income.

In developing countries, the story is more complex. In general, both measures suggest a less dramatic shift toward liberalization and openness than in industrial countries. For the developing countries as a whole, the rules-based restriction measure suggests that, after a period of liberalization in the 1970s, the trend toward openness reversed in the 1980s. Liberalization resumed in the early 1990s, but the pace has been relatively slow; the rules-based measure indicates that the current level of the indicator on average is only at the same level as it was in the late 1970s. By comparison, the capital account openness measure based on the estimated stocks of gross foreign assets and liabilities as a ratio of GDP shows a modest decline in openness to capital flows during the early 1970s, followed by a moderate increase in the 1980s and a sharp acceleration in the early 1990s.

II. Review of Literature on Capital Account Liberalization and Growth[18]

Economic theory suggests a number of benefits that may accompany capital account liberalization. Open capital accounts can foster a more efficient allocation of resources, provide opportunities for risk diversification, and help promote financial development. But there is also a good deal of skepticism concerning the benefits of capital mobility.

While analysis of the costs of capital account liberalization have been limited, there is a large and growing literature that tests the potential benefits of capital account liberalization through its influence on long-run growth and development, by directly investigating the empirical relationship between capital account liberalization and economic growth. Almost all of these studies augment a basic growth model that includes variables such as the level of schooling, investment, population growth, and the level of GDP in the initial year with a measure of capital account liberalization.

Table 6 presents an overview of these studies of the effects of capital account liberalization on growth. Each row of this table presents information on one study. The columns of the table offer information on the country coverage, the indicator of liberalization, the estimation techniques, and the general result of the studies.

The information presented in Table 6 indicates that there is a wide divergence in results across studies. This may reflect a number of differences in these studies. First, the country coverage is different across studies, with some authors analyzing industrial countries, others developing countries, and others a mixture of the

[18]Financial globalization is a vast and complex topic. Not surprisingly, there have been a number of papers written on this topic that are closely related to the work being surveyed. See, for example, the recent papers of Prasad and others (2003) and Lane and Milesi-Ferretti (2003).

Table 6. Overview of Studies of the Impact of Capital Account Liberalization on Growth

Study	Countries	Liberalization Measure	Dependent Variable and Estimation Method	Main Results for GDP Growth
Quinn (1997)	58	Δ*Quinn,* between 1988 and 1958	Growth in income per capita 1960–89. Cross section, OLS.	Δ*Quinn* significantly raises growth in income per capita, though no regression is presented with both ΔCapital Controls and ΔOpenness.
Klein and Olivei (1999)	67	*Share*	Growth in income per capita, 1976–95. Cross section, IV. Change in Financial Depth (ΔFD) as a function of *Share* and then per capita income growth as a function of instrumented value of ΔFD (and initial FD).	Significant effect of *Share* on ΔFD, though results seem to be driven by OECD countries in sample. Significant effect of instrumented values of ΔFD and FD on growth.
Edwards (2001)	55 to 62	*Quinn* in 1988; or Δ*Quinn* 1988–73	Growth in income per capita, 1980–89. Cross section, Weighted least squares (1985 GDP as weight), IV. Also uses interaction of Quinn in 1988 and log (GDP in 1980).	*Quinn* level significantly raises GDP growth. Interaction suggests that, at low GDP, opening capital account may lower GDP growth.
Arteta, Eichengreen, and Wyplosz (2001)	51 to 59	*Quinn* in initial year, or Δ*Quinn* over relevant period	Growth in income per capita 1973–81, 1982–87, 1988–92, or pooled for these three periods. Follows Edwards (2001) but with OLS rather than WLS and with different instruments.	*Quinn* significant for pooled results but not for shorter subsamples. Δ*Quinn* not significant. Significant effect of interaction of *Quinn* with either quality of law or openness.
Bekaert, Harvey, and Lundblad (2001)	95	Official dates of stock market liberalization	Growth rates in income per capita for various time periods between 1981 and 1997, resulting in overlapping data.	Stock market liberalization significantly contributes to growth in income per capita, with largest effects shortly after liberalization.
O'Donnell (2001)	94	*Share* or Volume	Growth in income per capita over 1971–94. Regressions include interaction between FD and *Share,* and Volume and FD.	Neither *Share* nor interaction of *Share* and FD significant, but Volume sometimes significant.

Table 6. *(concluded)*

Study	Countries	Liberalization Measure	Dependent Variable and Estimation Method	Main Results for GDP Growth
Chanda (2001)	57 non-OECD	*Share*	Growth in income per capita over 1975–95. *Share* interacted with measure of ethnic heterogeneity.	*Share* significantly raises growth in ethnically heterogeneous countries and significantly lowers it in ethnically homogeneous countries.
Grilli and Milesi-Ferretti (1995)	61	*Share*	Growth in income per capita for five-year nonoverlapping periods during 1971–94 period. IV estimation.	No evidence of a significant effect of *Share* on growth of income per capita.
Rodrik (1998)	About 100	*Share*	Growth in income per capita over 1975–95. Cross section, OLS.	No evidence of a significant effect of *Share* on growth of income per capita.
Kraay (1998)	64, 94, or 117	*Share, Quinn,* or Volume	Growth in income per capita over 1985–97. Cross section. OLS and IV. Samples of 117 (*Share*), 94 (CapFlow), or 64 (*Quinn*).	No effect of *Share* or *Quinn* on growth. Coefficient on Volume significant and positive.
Edison, Levine, Ricci, and Sløk (2002)	57	*Share,* CapStocks, or CapFlow	Growth in GDP per capita over 1980–2000, Cross section (OLS and IV); Panel (GMM). Regressions include interaction terms with financial development, initial income, schooling, institutional factors, and macroeconomic policies.	Using a wide array of measures, they find no evidence that international financial integration accelerates economic growth.
Klein (2003)	84 or 52	*Share* or *Quinn*	Growth in income per capita 1976–96, Cross section. Specification allows for quadratic interaction with initial income.	Significant effect found for middle-income countries but not for poor or rich countries.

Notes: *Share* is proportion of years that IMF's *AREAER* shows open capital accounts. *Quinn* is Quinn's 0–4 measure of capital account intensity. Δ*Quinn* is change in value of Quinn 0–4 measure. CapFlow is measure of volume of capital flows. Cross section refers to one observation per country.

two. Second, there are differences in the sample period, which may be particularly important for developing countries given the recent nature of many capital account liberalizations. Third, the applied methodology (cross-sectional, time series, or panel) and the estimation technique (ordinary least squares (OLS), instrumental variables (IV), or generalized method of moments (GMM)) differ across studies. Also, many of the authors of these studies recognize the potential for reverse causality and attempt to address it using instrumental variable estimation.[19]

We next survey these studies in more detail, beginning with work that offers support for the hypothesis that capital account liberalization promotes economic growth and then turning to studies that cast some doubt on this relationship.

Supporting Evidence of Capital Account Liberalization on Growth

Quinn's (1997) is one of the first studies to identify a positive result between capital account liberalization and growth. Quinn augments the set of variables included in a standard growth regression with either a variable representing his indicator of the change in financial openness (described above) or the change in a broader measure of openness.[20] The change in the financial openness variable and the change in the broader openness variable are calculated by subtracting the 1958 value of the index from its 1988 value. Quinn's empirical estimates suggest that the change in capital account liberalization has a strongly significant effect on the growth in real GDP per capita in his cross section of 58 countries over the period 1960 to 1989. It is hard to disentangle the separate effects of financial openness and a broader measure of openness in Quinn's results because he does not include a regression with both of these indicators. Therefore, to the extent that the change in financial openness is correlated with the change in the openness of trade in goods and services, the finding of a significant effect of the change in capital account liberalization on growth may reflect the correlation of changes in restrictions on the capital account and the current account.

Klein and Olivei (1999) find a positive effect of capital account liberalization on growth among industrial countries, but they do not find evidence that capital account liberalization promotes growth in nonindustrial countries. This study follows a slightly different strategy than does other research in this area by first focusing on the role of capital account liberalization on financial development and then considering the effect of financial development on growth. Klein and Olivei regress the change in financial depth on the capital account liberalization indicator *Share* described above (along with other standard regressors) over the period 1986 to 1995. They find a significant effect of capital account liberalization on the change in financial depth in the cross section of 82 developed and developing nations. This significant result seems to be because of the presence of the OECD countries in the

[19]For example, a country with weak economic performance might choose to adopt capital controls, and there is a danger in such a case to interpret incorrectly that the country's low growth depends on those controls.

[20]The base regression includes also initial GDP per capita, investment as a share of GDP, population growth, and secondary school enrollment rates.

sample. Klein and Olivei show that capital account liberalization significantly affects the change in financial depth in a sample consisting of the 20 OECD countries but not in a sample of the non-OECD countries, nor in a narrower non-OECD sample of 18 Latin American countries, a group that had a relatively high incidence of capital account liberalizations. They also estimate a growth model that includes the change in financial depth as regressor and find that financial development is a significant determinant of growth per capita. Klein and Olivei conclude that the beneficial effects of capital account liberalization, at least with respect to promoting financial depth, are achieved only in an environment where there is a constellation of other institutions that can usefully support the changes brought about by the free flow of capital. Bailliu (2000) also finds that capital account liberalization spurs growth by promoting financial development.

This conjecture, that the growth effects of capital account liberalization depend upon the level of development of an economy, is supported by the results presented in Edwards (2001). Edwards finds that both the *Quinn* level and the Δ*Quinn* variables are significantly associated with growth in per capita income in the 1980s for a sample of about 60 countries, though his results are not robust when he instead uses *Share.* Edwards estimates regressions using weighted least squares, with the weights representing national income in 1985. He includes both the capital account liberalization variables and an interactive term representing the product of the variables and the logarithm of income per capita in 1980. His estimates show a negative coefficient on capital account openness and a positive coefficient on the openness-income interactive term. This suggests that capital account openness detracts from growth for countries at lower levels of income but promotes growth in industrial countries and in the richer emerging market countries.

Edwards' methodology is scrutinized in Arteta, Eichengreen, and Wyplosz (2001). They question why Edwards obtains such strong results while other studies (cited below) fail to find any significant effect of capital account liberalization on growth. They point to a number of potential reasons for this discrepancy. They question whether Quinn's measures, representing capital account openness in 1973 and 1988 only, are appropriate for the period Edwards studies. They also note that weighting observations by 1985 per capita GDP means that rich countries have much more influence in the regressions than do poor countries. They also raise questions concerning the exogeneity of instruments used for capital account liberalization and the exclusion of other potentially relevant measures of openness, such as the openness of the current account, which may be correlated with capital account openness. Estimates by Arteta, Eichengreen, and Wyplosz suggest that Edwards' results may be sensitive to a variety of factors, and, therefore, they conclude that there is little evidence that capital account liberalization has more favorable effects in high-income and middle-income countries than in poorer developing countries.

But Arteta, Eichengreen, and Wyplosz do find some support for differences in the effect of capital account liberalization across countries, depending on the degree of macroeconomic stability. They introduce two capital account interaction terms, multiplying the Quinn openness measure by both the Sachs-Warner (1995) openness measure and the black market premium. They find that the interaction term representing the product of capital account openness and the black market premium is

significant, but that the other interaction term, representing the product of the Sachs-Warner openness measure and capital account openness, is not significant. They interpret this to mean that countries that open their capital accounts grow faster, but only if they first eliminate the black market premium.

Bekaert, Harvey, and Lundblad (2001) (henceforth BHL) examine the impact of stock market liberalization on economic growth. As previous researchers have done, they begin their analysis by augmenting the standard set of growth model variables with their variable indicating stock market liberalization. To maximize the time-series content in their regression, they use a moving average panel data method.[21] In general, BHL find that financial liberalization leads to a 1 percent increase in annual per capita GDP growth over a five-year period and that this effect is statistically significant. BHL investigate the robustness of this result with respect to alternative sets of liberalization dates, different country groupings, and different time horizons for measuring economic growth.

These results, along with those of Quinn, appear to be the strongest evidence supporting the hypothesis in published research that capital account liberalization promotes growth among developing countries. But, as discussed in more detail below, a recent paper by Klein (2003) provides evidence that capital account openness significantly contributes to growth among middle-income countries but not among poor countries or the richest countries.

Klein allows for a quadratic interaction between initial income and indicators of capital account openness (and thus nests the specification of Arteta, Eichengreen, and Wyplosz, 2001) as well as a quadratic interaction between indicators of government quality (which are highly correlated with income) and indicators of capital account openness. The finding that middle-income countries systematically benefit from capital inflows is consistent with the view of Rodrik (1999) that countries require adequate institutions, regulatory policies, and supervisory agencies to benefit from capital flows.

O'Donnell (2001) and Chanda (2001) also consider the possibility of differing effects of capital account openness across countries. O'Donnell examines the impact of capital account liberalization using both IMF rules-based measure and a quantitative-based measure of financial openness. Using a rather standard setup, he finds that the rules-based measure tends to be too coarse an indicator of the degree of capital account liberalization, as it does not take into account the nature of different types of controls. However, using the quantitative measure, he finds that capital account liberalization does seem to speed up economic growth. However, like other researchers, he finds that the benefits to all countries are not equal. Chanda (2001) suggests that the impact of open capital accounts may vary with the level of ethnic and linguistic heterogeneity in the society, a proxy for the number of interest groups. In particular, he finds that capital controls lead to greater inefficiencies and lower growth among countries with a high degree of ethnic and linguistic heterogeneity.

[21] This means that they create overlapping data and therefore have to deal with the resulting moving average error component by adjusting their standard errors.

Studies Not Supporting the Hypothesis That Liberalization Promotes Growth

Several studies have found no correlation between openness and growth. In fact, one of the first efforts to determine whether capital account liberalization promotes growth using a cross section of countries was Grilli and Milesi-Ferretti (1995), although this was not the main focus of their paper. This study considers average growth of per capita income for five nonoverlapping five-year periods between 1966 and 1989. Their sample includes 61 countries, although, with 181 observations in one set of regressions and 238 in another, not every country appears in each of the five subperiods. The authors regress five-year growth rates on *Share* and comparable measures that capture the presence of current account controls (*CurrAcct*) and a multiple exchange rate system (*MultEx*) from *Exchange Arrangements and Exchange Restrictions.* In addition they include variables such as initial income, political variables, and the level of schooling. The three variables *Share, CurrAcct,* and *MultEx* enter as predicted values from instrumental variable regressions using lagged values as the instruments. Their results do not support the hypothesis that capital account liberalization promotes growth. In some cases, capital account controls enter with a positive sign (that is, *Share* enters negatively), while the indicator of current account controls sometimes enters with a negative sign (*CurrAcct* is positive).[22]

Rodrik (1998), in a widely cited paper, also casts doubt on the effect of capital account liberalization on growth. In a sample that includes almost 100 countries, developing as well as developed, he finds no significant effect of capital account liberalization, as measured by *Share,* on the percentage change in real income per capita over the period 1975 to 1989 in growth regressions that also include initial per capita income, initial secondary-school enrollment rate, an index of the quality of governmental institutions, and regional dummy variables. Likewise, he finds no relationship between capital account liberalization and investment-to-income, or between capital account liberalization and inflation. Eichengreen (2001) offers several possible reasons for different results of Quinn's and Rodrik's papers, including the fact that Quinn's sample includes fewer developing countries than Rodrik's, the smaller proportion of years in Quinn's study representing the "lost decade" of the 1980s, and differences in the capital account indicator. The regressions presented in the next section allow us to explore the role of these potential sources of the differences in the two studies.

Kraay (1998) also finds no significant relationship, using a variety of measures of capital account openness, including *Share,* Quinn's capital account openness indicator (in levels, with values from 0 to 4), and a measure based on actual net capital flows. Each of these measures is associated with a different sample size. His regressions take the form of cross sections, with one observation per country, where the dependent variable is the growth in output between 1985 and 1997. He uses both OLS and an approach in which the capital account liberalization variables are instrumented by their own past values. He fails to find a significant effect of *Share* or the

[22] See their Table 4, p. 537.

Quinn indicator on growth, but, when these indicators are interacted with the average balance of the financial account (from the balance of payments statistics), he does find some significant effects.

Finally, Edison and others (2002) also find little evidence of a relationship between capital account liberalization and growth. Using a variety of econometric techniques and a new data set focusing on quantitative measures rather than rule-based measures, they find that financial integration does not accelerate economic growth per se, even when controlling for particular economic, financial, institutional, and policy characteristics. They do, however, find that international financial integration is positively associated with real per capita GDP, educational attainment, banking sector development, stock market development, the law-and-order tradition of the country, and government integrity (low levels of government corruption).

III. Empirical Investigation

The literature reviewed in the previous section offers a diverse set of results concerning the effect of capital account liberalization on growth. The discussion in that section also suggests that a direct comparison of these studies is difficult since they vary along a number of dimensions, including indicator of capital account openness or stock market liberalization, countries included, time period studied, and econometric technique employed.

In this section, we attempt to reconcile some of the differences in the literature by presenting regressions that capture the essential components of five of the studies we cite above. An exercise of strict replication of these studies would not be especially useful since it would not foster an effort to search for the source of differences across studies. Therefore, what we do instead is vary the indicator of capital account openness or stock market liberalization, the time period studied, and the set of countries in regressions that share a common regressand and a common set of other regressors.[23] We show, in the first subsection that—using this approach—we are able to replicate the main result in the five studies on which we focus.

As mentioned in the introduction, the real goal of this effort is not merely replication but also comparison. In the next subsection, we examine the robustness of the results presented in the first subsection by varying the sample and the regressors. We find that none of the specifications continue to offer a significant effect of capital account liberalization on growth once we include government reputation as a regressor. This confirms and extends the results presented by Rodrik (1998).

But, as we also mention in the introduction, we are able to go beyond this result to find countries for which there is a significant effect of capital account openness and stock market liberalization on economic growth. We present, in the third subsection, "Resolution," results that draw on recent work by one of the authors of this survey. Klein (2003) finds that allowing for a quadratic interaction between income per capita and the *Quinn* or the *Share* indicators of capital account openness, or the

[23] Of course, while all regressions include, for example, the regressors' initial income and initial investment, the actual value of these regressors will vary as the time period corresponding to the replication varies.

BHL indicator of stock market liberalization, revives the significance of the effect of these indicators on economic growth, even when including government reputation as a regressor. Interestingly, the set of countries for which growth is significantly affected by capital account openness or stock market liberalization includes middle-income countries but not poor countries or rich countries.

Replication

Table 7 presents our efforts at replication. Each column in this table reports the results of a cross-country growth regression in which one observation represents the experience of one country over the time period listed in the penultimate row of the table. The regressand, in each case, is the change in the logarithm of real GDP per capita over the period listed in the table. The regressors common across all specifications in this table include a standard set of variables used in growth regressions: the logarithm of the level of real per capita income in the first year of the sample, the average annual level of investment to GDP for the five years sur-

Table 7. Replication
(*Growth regressions for different capital account liberalization measures*[1])

	1: Quinn	2: AEW_1	3: AEW_2	4: G-MF	5: BHL	6: Rodrik
ln (initial inc.)	**–0.28**	*–0.27*	**–0.40**	**–0.35**	**–0.16**	**–0.27**
(s.e.)	(0.14)	(0.14)	(0.19)	(0.13)	(0.05)	(0.08)
ln (initial Educ.)	0.14	0.17	0.14	0.22	–0.002	0.07
(s.e.)	(0.23)	(0.14)	(0.14)	(0.18)	(0.09)	(0.12)
Av'g Initial Inv.	*0.03*	**0.04**	**0.05**	**0.04**	**0.019**	0.007
(s.e.)	(0.017)	(0.01)	(0.01)	(0.016)	(0.008)	(0.009)
Δpop	*–1.25*	**–1.43**	**–1.14**	**–2.40**	**–1.79**	–0.22
(s.e.)	(0.68)	(0.53)	(0.55)	(0.55)	(0.42)	(0.88)
Africa dummy	**–0.78**	**–0.45**	**–0.53**	–0.25	**–0.47**	–0.18
(s.e.)	(0.21)	(0.19)	(0.22)	(0.25)	(0.13)	(0.17)
$\Delta Quinn_{58–88}$	**0.17**					
(s.e.)	(0.07)					
$Quinn_{88}$		**0.18**	–0.42			
(s.e.)		(0.07)	(0.52)			
$Quinn_{88}$*GDP_{80}			0.07			
(s.e.)			(0.07)			
$Share_{70–89}$				0.08		–0.03
(s.e.)				(0.20)		(0.09)
GovRep.						**0.25**
(s.e.)						(0.05)
$BHL_{80–95}$					**0.56**	
(s.e.)					(0.19)	
R^2	0.52	0.45	0.54	0.58	0.62	0.53
Sample period	1970–89	1973–92	1973–92	1970–89	1980–95	1976–89
No. of observations	53	55	55	49	89	73

Table 7. *(concluded)*

Overall effect of capital account liberalization evaluated at the i[th] GDP percentile:	
25th Percentile (s.e.)	0.09
	(0.09)
50th Percentile (s.e.)	**0.15**
	(0.07)
75th Percentile (s.e.)	**0.25**
	(0.10)

Sources: [1]Quinn, Dennis, 1997, "The Correlates of Change in International Financial Regulation," *American Political Science Review,* Vol. 91 (September), pp. 531–51; Arteta, Carlos, Barry Eichengreen, and Charles Wyplosz, 2001, "On the Growth Effects of Capital Account Liberalization" (unpublished; Berkeley, California: University of California); Grilli, Vittorio, and Gian Maria Milesi-Ferretti, 1995, "Economic Effects and Structural Determinants of Capital Controls," *IMF Staff Papers,* Vol. 42, No. 3, pp. 517–51; Bekaert, Geert, Campbell Harvey, and Christian Lundblad, 2001, "Does Financial Liberalization Spur Growth?" NBER Working Paper No. 8245 (Cambridge, Massachusetts: National Bureau of Economic Research); Rodrik, Dani, 1998, "Who Needs Capital-Account Convertibility?" in Stanley Fischer, and others, *Should the IMF Pursue Capital Account Convertibility?* Essays in International Finance, No. 207 (Princeton: International Finance Section, Department of Economics, Princeton University), May.

Notes: All estimates using OLS with robust standard errors; regressions include a constant (not reported); endogenous variable = growth in ln real per capita income over sample period; ln (initial inc.) = ln real per capita income in first year of sample; ln (Educ.) = ln (secondary-school enrollment rate) in 1976 (for lack of data, the first year of each sample period could not be used; however, the cross-section variation is likely to be the same); Av'g Initial Inv. = average investment to GDP ratio over the five-year period around the first year of the sample; Δpop = population growth over sample period; Africa dummy = dummy variable for African countries; share = proportion of years with open capital accounts over sample period, from IMF's *AREAER;* Quinn_{88} = 0 to 4 measure of capital account openness in 1988 and $\Delta\text{Quinn}_{58-88}$ = difference in 0 to 4 measure of capital account openness between 1958 and 1988, both from Quinn (1997); BHL_{80-95} = Proportion of years between 1980 and 1995 with liberalized stock market, using dates of stock market liberalization from Bekaert, Harvey, and Lundblad (2001). Three rows labeled "Percentile" evaluate sum of coefficients on "Quinn_{88}" and on "$\text{Quinn}_{88} \times \ln(\text{GDP per Capita}_{1980})$" for values of GDP per capita at 25th, 50th, and 75th percentile, respectively; GovRep. = Knack and Keefer (1995) measure of degree to which governments do not repudiate contracts; range is 1–10; and larger values indicate government less likely to repudiate contract; **bold** denotes *p*-value of coefficient 0.05 or less; *italic* denotes *p*-value of coefficient 0.05 to 0.10.

rounding the initial year of the time period, the logarithm of the secondary school enrollment rate in 1976, the growth rate of the country's population over the sample period, and a dummy variable for African countries.

We focus on five studies discussed in Section II: Quinn (1997) (replicated in column 1 of Table 7); Arteta, Eichengreen, and Wyplosz (2001) (columns 2 and 3); Grilli and Milesi-Ferretti (1995) (column 4); Bekaert, Harvey, and Lundblad (2001) (column 5); and Rodrik (1998) (column 6). The capital account openness indicators used in these regressions reported in columns 1–4 and 6 match those used by the respective studies. The stock market liberalization indicator used in the regression reported in column 5 draws from the data presented by Bekaert, Harvey, and Lundblad, as discussed in Section II. The samples chosen, in terms of period and

countries included, is as close as possible to the ones in the original studies.[24] Replications of the two studies that employ Quinn's measure of capital account openness are reported in columns 1, 2, and 3 of Table 7. The regression reported in column 1 replicates the work of Quinn. The regressor in this case is the difference between the value of Quinn's 0–4 indicator of capital account openness in 1988 and its value in 1958. Quinn uses this change in the value of openness in his work, and, as is the case in his research, we find a positive and significant effect of this variable on the economic growth for the 55 countries he studies. Arteta, Eichengreen, and Wyplosz use the level of Quinn's 0–4 indicator of capital account openness in 1988 rather than its change. We are able to replicate their finding of a significant effect of this variable on economic growth in the regression reported in column 2. These authors are also interested in the manner in which the effect of capital account openness on growth varies with income. In column 3 we replicate this effort by including, as a regressor, the interaction between the Quinn 1988 indicator and the logarithm of GDP per capita in 1980. We report the partial derivative of growth with respect to the Quinn 1988 indicator for the country at the 25th percentile of income, the 50th percentile of income, and the 75th percentile of income. The results presented in column 3 suggest that there is a significant effect of capital account openness on rich countries but not on poorer countries. This is somewhat at odds with the results presented by Arteta, Eichengreen, and Wyplosz, who find, in their words, "scant evidence" of an effect of capital account liberalization on growth for richer countries.

The regression reported in column 4 of Table 7 replicates one of the central results reported in Grilli and Milesi-Ferretti (1995). As in their work, this regression fails to offer a significant effect of capital account openness, as measured by the IMF *AREAER* indicator *Share*.[25] Column 5 of Table 7 presents a regression to consider the effect of stock market liberalization on economic growth. This regression draws on the dating of stock market liberalizations by Bekaert, Harvey, and Lundblad (2001) discussed in the previous section. While the cross-sectional approach we use differs from the one undertaken by those authors, we find a similar result: that economic growth is positively and significantly associated with stock market liberalization over the period 1980 to 1995 for the nearly 100 countries studied.

Like Grilli and Milesi-Ferretti, Rodrik (1998) uses the *Share* measure of capital account openness but has a wider country coverage and, more importantly,

[24] The earliest data we have is from 1970, while the Quinn and Grilli and Milesi-Ferretti studies draw data from a slightly earlier starting point. Recall also that the regressions in both the Quinn and Rodrik studies matched the cross-sectional form of those presented in Table 7, while time series-cross section studies were used by Grilli and Milesi-Ferretti, who had nonoverlapping five-year periods, and Arteta, Eichengreen, and Wyplosz, who had pooled data using three nonoverlapping periods for each country. Bekaert, Harvey, and Lundblad used overlapping observations in their cross-country study. Furthermore, the results below are generally robust to whether the estimation method is OLS or IV.

[25] The regression reported in column 4 covers a set of countries that closely correspond to those in the Grilli and Milesi-Ferretti study. Note, however, that in a sample of almost 100 countries, we found a significant and positive effect of capital account liberalization on growth.

includes the variable *GovRep*. This measure, developed by Knack and Keefer (1995), draws on information from various volumes of the *International Country Risk Guide*. The variable potentially ranges from 1 to 10, with larger values indicating that a government is less likely to repudiate contracts. For most countries, the variable reflects reputation in 1982. The regression result presented in column 6 includes a highly significant effect of *GovRep* on growth but, with the inclusion of this variable, no significant effect of capital account openness. These results match closely those presented by Rodrik.[26]

Thus, overall, we are able to replicate the main results found in the five studies we consider. The real advantage of this exercise, however, is that it allows us to move forward and consider, in a consistent manner, the robustness of these results when the sample is adjusted or when an additional regressor is introduced.

Robustness

Table 8 revisits five of the six regressions presented in Table 7 to consider the robustness of those results. Slightly modifying the specifications presented in Table 7 through the inclusion of government reputation as a regressor eliminates the significance of capital account openness or stock market liberalization on growth, no matter which indicator is used. Thus, in this context, the point made by Rodrik about a regression that uses the IMF *AREAER* measure applies to regressions that employ other measures as well.[27]

The first column of Table 8 reconsiders the result presented by Quinn (1997) by including the government reputation indicator in a regression that otherwise matches that presented in column 1 of Table 7. Comparing the results in the first column of each table, we see that the inclusion of the government reputation indicator causes the significance of the indicator of capital account liberalization to decrease, with its *p*-value rising from 0.018 when government reputation is not included in the regression to 0.101 when it is included.

The next two columns of Table 8 augment the Arteta, Eichengreen, and Wyplosz regressions presented in Table 7 by including the government reputation indicator. The *Quinn* capital account openness indicator is no longer significant, whether it is interacted with income or not.

The fourth column of Table 8 shows that the coefficient on the *Share* indicator of capital account openness continues to be statistically insignificant when government reputation is included as a regressor. The fifth column of this table shows that the coefficient on the *BHL* indicator of stock market liberalization also is insignificant when government reputation is included as a regressor (the *p*-value is 0.353), in

[26]This measure, government reputation, is closely linked to quality of institutions. Recently, the literature on growth and institutions has reported that institutions play an important role in economic performance. See, for example, Acemoglu and others (2003); Easterly and Levine (2003); Rodrik, Subramanian, and Trebbi (2002); and IMF (2003).

[27]Note that the regressions in Table 8 may include a smaller sample than the corresponding regressions in Table 7 because of the limited availability of the government reputation measure.

Table 8. Robustness
(*Growth regressions for different capital account liberalization measures*[1])

Original Study Change from Table 7 Specif.	1:Quinn Include GovRep.	2:AEW$_1$ Include GovRep.	3:AEW$_2$ Include GovRep.	4:G-MF Include GovRep.	5:BHL Include GovRep.
ln (initial inc.)	**–0.43**	**–0.32**	**–0.28**	**–0.45**	**–0.30**
(s.e.)	(0.12)	(0.10)	(0.14)	(0.13)	(0.07)
ln (initial Educ.)	0.05	–0.08	–0.07	0.12	0.05
(s.e.)	(0.20)	(0.12)	(0.13)	(0.21)	(0.11)
Av'g Initial Inv.	0.019	**0.034**	**0.03**	**0.029**	*0.015*
(s.e.)	(0.012)	(0.007)	(0.007)	(0.01)	(0.008)
Δpop	–0.48	–0.45	–0.54	–0.54	–0.87
(s.e.)	(0.59)	(0.50)	(0.48)	(0.49)	(0.57)
Africa dummy	**–0.97**	**–0.62**	**–0.60**	–0.44	**–0.70**
(s.e.)	(0.16)	(0.12)	(0.15)	(0.23)	(0.13)
ΔQuinn	*0.09*				
(s.e.)	(0.056)				
Quinn$_{88}$		0.06	0.28		
(s.e.)		(0.05)	(0.38)		
Quinn$_{88}$*GDP$_{80}$			–0.03		
(s.e.)			(0.05)		
Share		0.43		–0.04	
(s.e.)		(0.17)		(0.13)	
BHL$_{80–95}$					0.16
(s.e.)					(0.17)
GovRep.	**0.25**	**0.27**	**0.28**	**0.30**	**0.22**
(s.e.)	(0.05)	(0.05)	(0.06)	(0.04)	(0.05)
R^2	0.69	0.73	0.74	0.73	0.77
Sample period	1970–89	1973–92	1973–92	1970–89	1980–95
No. of observations	52	53	53	45	71
Overall effect of capital account liberalization evaluated at the ith GDP percentile:					
25th Percentile (s.e.)			0.09		
			(0.07)		
50th Percentile (s.e.)			0.07		
			(0.05)		
75th Percentile (s.e.)			0.03		
			(0.08)		

Sources: [1]Quinn, Dennis, 1997, "The Correlates of Change in International Financial Regulation," *American Political Science Review,* Vol. 91 (September), pp. 531–51; Arteta, Carlos, Barry Eichengreen, and Charles Wyplosz, 2001, "On the Growth Effects of Capital Account Liberalization," (unpublished; Berkeley, California: University of California); Grilli, Vittorio, and Gian Maria Milesi-Ferretti, 1995, "Economic Effects and Structural Determinants of Capital Controls," *IMF Staff Papers,* Vol. 42, No. 3, pp. 517–5; and Bekaert, Geert, Campbell Harvey, and Christian Lundblad, 2001, "Does Financial Liberalization Spur Growth?" NBER Working Paper No. 8245 (Cambridge, Massachusetts: National Bureau of Economic Research).

Notes: See Table 7 for definition of variables. All estimates using OLS with robust standard errors; regressions include a constant term (not reported); definition of variables described in notes to Table 7; **bold** denotes *p*-value of coefficient 0.05 or less; *italic* denotes *p*-value of coefficient 0.05 to 0.10.

contrast to the results presented in Table 7, column 5, where the coefficient on this indicator has the *p*-value of 0.004.[28]

In summary, the results presented in Table 8 suggest that the inclusion of an indicator of institutional quality, such as government reputation, diminishes the significance of the effect of capital account liberalization on economic growth, which is consistent with the original findings of Rodrik (1998).

Resolution

The results presented in Table 8 are consistent with the lack of a significant effect of capital account openness or stock market liberalization on economic growth, across different indicators, across different samples, and regardless of whether the effect of capital account openness is allowed to vary with income. However, if one allows for a more flexible specification, there appears to be some evidence that capital account openness and stock market liberalization do, in fact, significantly contribute to economic growth for middle-income countries though not for poor countries or the wealthiest countries.

The results reported here draw heavily on Klein (2003), who shows that a flexible specification yields a significant effect of capital account openness or stock market liberalization on economic growth. We highlight the results drawn from that paper that are based on a cross-section regression, which takes the following specification:

$$\Delta lnY_{1976-1995,i} = \beta_0 Z_i' + \beta_1 K_i + \beta_2 (K_i \times lnY_{1976,i}) + \beta_3 (K_i \times lnY_{1976,i}^2) + \varepsilon_i,$$

where $\Delta lnY_{1976–1995,i}$ is the change in the natural logarithm of real per capita income between 1976 and 1995 of country *i*, K_i is an indicator of capital account openness of country *i* (the IMF's *AREAER*-based $Share_{1976–95}$, the 0–4 measure $Quinn_{1982}$, or the stock market liberalization indicator drawn from the work of Bekaert, Harvey, and Lundblad, $BHL_{1980–95}$), $lnY_{1976,i}$ is the natural logarithm of real per capita income in 1976 for country *i*. $\mathbf{Z_i}$ is a matrix of control variables that includes *GovRep,* the indicator of government reputation, as well as variables standard in cross-country growth regressions, including $lnY_{1976,i}$, the logarithm of the secondary school enrollment rate, the average rate of investment to GDP over the years 1974 to 1978, the growth rate of the population between 1976 and 1995, and a dummy variable for African countries. We focus on the estimated partial derivative of growth with respect to capital account openness, B_i, where

$$B_i = \beta_1 + \beta_2 lnY_{1976,i} + \beta_3 lnY_{1976,i}^2.$$

The subscript for B_i reflects the fact that the estimated effect of capital account openness on growth varies across countries because of their differences in income.[29]

[28] Given the large change in the sample size between the regressions presented in column 5 of Tables 7 and 8, it is worth noting that running the regression with the specification of that in column 5 of Table 7 but with the sample used in column 5 of Table 8 (which has 71 observations) yields a coefficient on the *BHL* indicator of stock market liberalization of 0.48 with a *p*-value of 0.031.

[29] Unlike the specifications presented in the previous tables, with the 1988 value of the Quinn indicator of capital account openness, we use the 1982 value of this indicator, since this is more representative of the initial conditions with respect to capital account liberalization.

Table 9 summarizes the results from estimates that employ the three indicators of capital account openness mentioned above. The results for nonlinear effects suggest that a group of countries exists for which there is a significant effect of financial openness on growth. Such countries are characterized by an intermediate level of income at the beginning of the sample, which is likely to proxy for the initial level of development.

There is a significant estimated effect of financial openness on growth for one-ninth of the countries in the sample when using the 1982 Quinn indicator of cap-

Table 9. Resolution
(*Growth regressions for different capital account liberalization measures*[1])

	Capital Account Openness Indicator: K		
	$Quinn_{82}$	Share	$BHL_{80–95}$
ln (initial inc.)	–0.17	**–0.29**	**–0.25**
(s.e.)	(0.13)	(0.10)	(0.11)
ln (initial Educ.)	–0.04	0.10	0.03
(s.e.)	(0.10)	(0.10)	(0.10)
Av'g Initial Inv.	**0.02**	0.01	0.01
(s.e.)	(0.01)	(0.01)	(0.01)
Δpop	**–0.72**	**–0.20**	–0.26
(s.e.)	(0.33)	(0.45)	(0.48)
Africa dummy	**–1.13**	**–0.58**	**–0.68**
(s.e.)	(0.13)	(0.14)	(0.13)
K	*–1.91*	**–10.14**	**–8.47**
(s.e.)	(1.44)	(4.18)	(3.75)
K*GDP	*0.60*	**2.86**	**2.57**
(s.e.)	(0.35)	(1.13)	(0.98)
$K*GDP^2$	**–0.04**	**–0.20**	**–0.18**
(s.e.)	(0.02)	(0.07)	(0.06)
Gov. Rep.	**0.25**	**0.30**	**0.25**
(s.e.)	(0.05)	(0.05)	(0.05)
R^2	0.82	0.77	0.79
Sample period	1976–95	1976–95	1976–95
No. of observations	54	73	71
GDP Percentile (s.e.): 25th	0.12	0.07	0.46
	(0.09)	(0.14)	(0.32)
50th Percentile (s.e.)	**0.13**	**0.29**	**0.61**
	(0.06)	(0.13)	(0.26)
75th Percentile (s.e.)	0.04	0.26	**0.38**
	(0.07)	(0.17)	(0.18)

Sources: [1]Quinn, Dennis, 1997, "The Correlates of Change in International Financial Regulation," *American Political Science Review,* Vol. 91 (September), pp. 531–51 and Bekaert, Geert, Campbell Harvey, and Christian Lundblad, 2001, "Does Financial Liberalization Spur Growth?" NBER Working Paper No. 8245 (Cambridge, Massachusetts: National Bureau of Economic Research).

Notes: See Table 7 for definition of variables. All estimates using OLS with robust standard errors; regressions include a constant term (not reported); definition of variables described in notes to Table 7; **bold** denotes *p*-value of coefficient 0.05 or less; *italic* denotes *p*-value of coefficient 0.05 to 0.10.

ital account openness. These countries range, in 1976 per capita income, from Malaysia to Mexico (which were at the 48th and 56th percentiles of initial income in this sample, respectively; see Table 10). More than one-fifth of the countries in the sample exhibit a significant estimated effect of capital account liberalization on growth when using *Share.* The countries in this group have initial per capita income that ranges from the 42nd percentile (Ecuador) to the 64th percentile (Portugal). The regression with the largest group of countries in which there is a significant estimated effect of liberalization on growth is the one using the Bekaert, Harvey, and Lundblad indicator of stock market liberalization. In this case, almost two-fifths of the countries have an estimated significant effect, and this set of countries ranges from Côte d'Ivoire, whose 1976 level of per capita income is at the 38th percentile of the sample used in this regression, to Italy, which was at the 76th percentile in 1976 per capita income.

These results seem to suggest that countries can benefit from capital account liberalization when their level of development is not too primitive (as they would lack the institutional structure necessary to fit liberalization in the growth engine) or too advanced (as they would have already reaped the benefits).

IV. Conclusion

The consequences and desirability of capital account liberalization among developing countries is likely to remain a topic of debate for the foreseeable future. People on one side of this debate will maintain that those countries that open up to financial flows will set the stage for more rapid development. Those on the other side will question the advantages actually conferred by capital account liberalization and, furthermore, will argue that countries become more vulnerable to financial disruptions not of their own making when their governments relinquish control over the inflow and outflow of capital.

In this paper we have surveyed which measures of capital account liberalization have been employed, as well as what current research is able to tell us about the consequences of capital account liberalization. We point out that while industrial countries have largely liberalized their capital accounts and there has been some movement toward more widespread capital account liberalization among developing countries, the majority of developing countries retain controls over capital flows. Different indicators of capital account openness offer a broadly consistent picture of the pattern of liberalization.

The evidence presented in the literature on the effects of capital account openness on economic growth is somewhat mixed. The exercise undertaken in this paper replicates these results and, furthermore, shows that results using the specifications employed in most existing studies fail to present a significant effect of capital account openness on economic growth if the regressions also include an indicator of government reputation. But we have also demonstrated that more recent results do offer a consistent effect of capital account openness and stock market liberalization on economic growth for middle-income countries, though not for poorer or richer countries. In fact, we find that introducing nonlinear variables, such as the interaction

Table 10. Economic Development[1]

Group 1 $115–$298	Group 2 $299–$764	Group 3 $765–$1,953	Group 4 $1,954–$4,992	Group 5 $4,993–$12,761	Group 6 $12,762–$32,622
Equatorial Guinea	Tanzania	Dominica	Panama	Greece	Denmark
Nepal	Lao PDR	El Salvador	Costa Rica	Israel	Iceland
Ethiopia	Mali	Vanuatu	Algeria	Gabon	Luxembourg
Chad	China	Nigeria	Seychelles	Hong Kong SAR	Saudi Arabia
		Papua New Guinea	Iran, Islamic Rep.	Trinidad and Tobago	
Guinea-Bissau	Lesotho	Swaziland	Suriname	Spain	Sweden
Bangladesh	Pakistan				Norway
	Central African Republic	Morocco	Chile	Oman	
Myanmar	Uganda	Colombia	Mexico	Ireland	Switzerland
Malawi					Kuwait
	Sierra Leone	St. Lucia	South Africa	Bahamas	United Arab Emirates
Burundi		St. Kitts and Nevis			
	Maldives		Portugal	New Zealand	Qatar
Bhutan		Guyana		Netherlands Antilles	
	Comoros	Guatemala	Uruguay	Argentina	
Rwanda	Guinea	Peru	Namibia	Italy	
India	Gambia, The	Côte d'Ivoire	Barbados	Bahrain	
Haiti	Kenya		Venezuela		
Burkina Faso	São Tomé and Príncipe	Mauritius		Japan	
	Niger	Brazil	Singapore	United Kingdom	
Sri Lanka		Dominican Republic			
Mozambique	Mauritania			Germany	

Madagascar	Belize	Austria
Benin	Congo, Rep.	Australia
Togo	Jamaica	Finland
Vietnam	Tunisia	Canada
Nicaragua	Paraguay	Libya
Egypt, Arab Rep.	Ecuador	United States
Sudan	Ghana	Belgium
	Syrian Arab Republic	
Senegal		Netherlands
St. Vincent and the Grenadines	Lebanon	
Cape Verde	Turkey	France
Congo, Dem. Rep.		
Indonesia	Korea, Rep.	
Tonga	Malaysia	
Zambia	Fiji	
	Jordan	
Philippines	Antigua and Barbuda	
Samoa		
Honduras		
Thailand		
Djibouti		
Bolivia		
Zimbabwe		
Cameroon		

[1]Countries are sorted within groups, in ascending order, by real per capita GDP in 1976. For each income group the difference between the highest income country and the lowest is equal in natural logs. In dollar terms, income in the highest income country within each group is about 2.5 times that of the lowest income country.

between GDP and capital account liberalization, turns out to give significant results. Such findings may be a reason why different studies (each neglecting the nonlinear nature of the relationship) find different results and may suggest that an intermediate level of development may be necessary for a country to benefit from capital account liberalization.

Given the importance of this topic, the lack of a clear consensus in the literature, and, perhaps most importantly, the fact that undertaking capital account liberalization is more easily achieved than many other policies advocated to governments of developing countries, it is very likely that the literature on the topic surveyed in this paper will continue to expand. The concern that this research is hampered by a strong set of variables reflecting capital account openness should be somewhat allayed by the statistics presented in this paper showing a common cross-country picture of capital account openness regardless of the (admittedly imperfect) indicators that are employed. But, as better indicators are developed, and as we obtain a longer time series that encompasses a wider range of experiences, we expect that our understanding of this important topic will be refined.

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