Why doesn't Capital Flow from Rich to Poor Countries? An Empirical Investigation *

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Abstract

We examine the role of different explanations for the lack of flows of capital from rich to poor countries—the Lucas paradox—in an empirical framework. Broadly speaking, the theoretical explanations for this paradox include differences in fundamentals affecting the production structure versus international capital market imperfections. Our cross-country regressions show that, for the period 1971−1998, institutional quality is the most important causal variable explaining the Lucas paradox. Human capital and asymmetric information play a role as determinants of capital inflows but these variables cannot fully account for the paradox.

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1 Introduction

The neoclassical theory predicts that capital should flow from rich to poor countries. Under the standard assumptions such as countries produce the same goods with the same constant returns to scale production function and the same factors of production—capital and labor—differences in income per capita reflect differences in capital per capita. Thus, if capital were allowed to flow freely, the return to investment in any location should be the same. However, in his now classic example, Lucas (1990) compares the U.S. and India in 1988 and finds that, if the neoclassical model were true, the marginal product of capital in India should be about 58 times that of the U.S. In the face of such return differentials all capital should flow from U.S. to India. We do not observe such flows. Lucas questions the validity of the assumptions that give rise to these differences in the marginal product of capital and asks what assumptions should replace these. According to Lucas, this is the central question of economic development.

The main theoretical explanations for the Lucas paradox can be grouped into two categories. The first group of explanations includes differences in *fundamentals* that affect the production structure of the economy. These can be omitted factors of production, government policies, and institutions.[1] All of these affect the marginal product of capital via the production function.[2] The second group of explanations focuses on *international capital market imperfections*, mainly sovereign risk and asymmetric information. Although the capital is productive and has a high return in developing countries, it does not go there because of the market failures.[3] According to Lucas, international capital market failures cannot be an explanation for the lack of flows before 1945 since during that time all of the third world was subject to European legal arrangements imposed through colonialism. Hence, investors in the developed countries could expect contracts to be enforced in a similar fashion both in the home and in the foreign country.[4]

Our objective in this paper is to investigate the role of these different theoretical explanations for the lack of flows of capital from rich countries to poor countries in a systematic empirical

[1] For the role of different production functions, see King and Rebelo (1993); for the role of government policies, see Razin and Yuen (1994). Tornell and Velasco (1992) rationalize capital flight from poor countries in a model, where property rights are not well defined within the country.

[2] Lucas considers both the differences in human capital quality and the role of human capital externalities. He finds that accounting for the differences in human capital quality significantly reduces the return differentials and considering the role of externalities eliminates the return differentials. However his calculation assumed that the externalities from the country's stock of human capital accrue entirely to the producers within the country, i.e., all knowledge spillovers are local.

[3] Gertler and Rogoff (1990) show asymmetric information problems may cause a reversal in the direction of capital flows relative to the perfect information case. Gordon and Bovenberg (1996) develop a model with asymmetric information that explains the differences in corporate taxes and hence the differences in the real interest rates.

[4] Before 1945 European imperial powers granted trading rights to monopoly companies, an action that created one-way flows. In theoretical terms a large capital exporting economy can have monopoly power to limit capital flows in order to push interest rates in a favorable direction. However, Gordon and Bovenberg (1996) note that there is little evidence that large countries have restricted capital flows for this purpose.

framework.[5] We run cross-country regressions using a sample of 50 countries. Our empirical evidence shows that, for the period 1971−1998, the most important variable in explaining the Lucas paradox is the institutional quality. We find that this is a causal relationship that holds true even after controlling for other variables that might determine capital inflows.

The work on institutions and economic development shows that countries with better institutions, such as secure property rights and non-corrupt governments, invest more in physical and human capital, use these factors more efficiently, and achieve a higher level of income.[6] This paper suggests that institutional quality also shaped international capital flows in the period 1971−1998. In addition, we run regressions with a smaller set of countries for the period 1918−1945. The purpose of this exercise is to see whether pre− and post−1945 explanations differ, as Lucas claimed. Preliminary findings show that, in that earlier period human capital might have explained the lack of flows.[7]

The Lucas Paradox is related to some of the major puzzles in international macroeconomics and finance. These are the high correlation between savings and investment in OECD countries (the Feldstein-Horioka puzzle); the lack of investment in foreign capital markets by the home country residents (the home bias puzzle); the low correlations of consumption growth across countries (the lack of international capital market integration or the risk sharing puzzle).[8] All of these puzzles deal with the question of the lack of international capital flows, more specifically the lack of international portfolio equity holdings. However, the empirical literature on these issues is extremely thin and not in agreement. In particular, we still do not know what is more important in explaining the Lucas paradox: fundamentals or market failures? Some researchers provide indirect historical evidence that emphasizes the role of schooling, natural resources, and demographic factors as a reason for the European investment into the new world.[9] The empirical literature on the determinants of capital flows has focused on the role of external (push) and internal (pull) factors using a cross-section of countries. Researchers find that external factors, mostly low interest rates in the developed nations, in particular in the U.S., played an important role in accounting for the renewal of foreign lending

[5]Obstfeld (1995) argues that the most direct approach would be to compare capital's rate of return in different countries. Unfortunately, it is difficult to find internationally comparable measures of after tax returns to capital. King and Rebelo (1993) explore the role of each explanation by calibrating different models to see how much each can account for the paradox. However, some of the parameters needed for the calibration exercise have not been measured for most countries.

[6]See North (1981, 1994), Hall and Jones (1999), Acemoglu, Johnson and Robinson (2001, 2002).

[7]Note that no data is available for the Bretton-Woods era; 1945−1970. This is an era of capital controls and restructuring.

[8]See Obstfeld and Rogoff (2000) for an overview of the major puzzles in international economies.

[9]In the context of British investment experience before World War I, O'Rourke and Williamson (1999) found that, British capital chased European emigrants, where both were seeking cheap land and natural resources. Clemens and Williamson (2003) using data on British investment in 34 countries during 19th century show that, two thirds of the historical British capital exports went to labor-scarce new world and only about one quarter of it went to labor abundant Asia and Africa because of similar reasons.

to developing countries in 1990s.[10] The literature has paid particular attention to the determinants of foreign direct investment (FDI) and shows that government size, political stability, and openness have an important role.[11] In terms of the determinants of bilateral equity flows and external debt some studies find support for theories that emphasize imperfections in international credit markets.[12] These papers, however, have not paid particular attention to the role of institutions in shaping international capital flows.[13]

The rest of the paper is organized as follows. Section 2 examines the standard neoclassical model and presents the main empirical implications in terms of capital movements. Section 3 investigates the role of the different theoretical explanations of the Lucas Paradox in a cross-country regression framework. Section 4 concludes.

2 Conceptual Issues

Assume a small open economy where output is produced using capital (K) and labor (L) via a Cobb-Douglas production function.

$$Y_t = A_t F(K_t, L_t) = A_t K_t^{\alpha} L_t^{1-\alpha} \qquad F'(.) > 0, \qquad F''(.) < 0, \qquad F(0) = 0, \tag{1}$$

where Y denotes output and A is the productivity parameter. Agents can borrow and lend resources internationally. If all countries share a common technology, perfect capital mobility implies the instantaneous convergence of the interest rates. Hence, for countries i and j,

$$A_t f'(k_{it}) = r_t = A_t f'(k_{jt}), \tag{2}$$

where $f(.)$ is the net of depreciation production function in per capita terms. The property of diminishing returns to capital implies that in the transition process, resources will flow from capital abundant countries (low returns) to capital scarce countries (high returns). Although widely used in the growth literature, the neoclassical model has counterfactual implications for rates of returns since not enough capital seems to flow to capital scarce countries and implied interest rates do not seem to converge. As explained in the introduction the theoretical explanations for this paradoxical pattern in capital flows can be grouped as differences in fundamentals versus international capital market imperfections. We investigate each group in detail below.

[10] See Calvo, Leiderman and Reinhart (1996).

[11] See Edwards (1991). Wei and Wu (2002) find that corrupt countries receive substantially less FDI.

[12] See Lane (2000) and Portes and Rey (2002).

[13] In a recent paper using a proxy measure for capital, Kalemli-Ozcan, Sorensen, and Yosha (2003b) show that capital does flow from low marginal product states to high marginal product states across the U.S. Hence, the neoclassical model's prediction holds within the U.S., where there is a common institutional structure.

2.1 Fundamentals

2.1.1 Omitted Factors of Production

We can account for the lack of capital flows from rich to poor countries by looking at the existence of other factors—such as human capital and land—that positively affect the returns to capital but are generally ignored by the conventional neoclassical approach. For example, if human capital positively affects capital's return, less capital tends to flow to countries with lower endowments of human capital. Thus, if the production function is in fact given by

$$Y_t = A_t F(K_t, Z_t, L_t) = A_t K_t^{\alpha} Z_t^{\beta} L_t^{1-\alpha-\beta}, \tag{3}$$

where Z_t denotes another factor that affects the productive process, then (2) misrepresents the implied capital flows. Hence, for countries i and j, the true return is given by

$$A_t f'(k_{it}, z_{it}) = r_t = A_t f'(k_{jt}, z_{jt}). \tag{4}$$

2.1.2 Government Policies

Government policies can be another impediment to the flows and the convergence of the returns. For example, differences across countries in government tax policies can lead to substantial differences in capital-labor ratios. Also, inflation may work as a tax and decrease the return to capital.[14] In addition, the government can explicitly limit capital flows by imposing capital controls. We can model the effect of these distortive government policies by assuming that governments tax capital returns at a rate τ, which differs across countries. Hence, for countries i and j, the true return is given by

$$A_t f'(k_{it})(1 - \tau_{it}) = r_t = A_t f'(k_{jt})(1 - \tau_{jt}). \tag{5}$$

2.1.3 Institutions

Institutions are the rules of the game in a society.[15] They consist of both informal constraints (traditions, customs) and formal rules (rules, laws, constitutions, laws). They provide the incentive structure of an economy. Institutions are understood to affect economic performance through their effect on investment decisions by protecting the property rights of entrepreneurs against the

[14] See Razin and Yuen (1994) and Gomme (1993).

[15] More formally, North (1994) defines institutions as the humanly devised constraints that structure political, economic, and social interaction. There is an important distinction between policies and institutions. Policies are choices made within a political and social structure, i.e., within a set of institutions.

government and other segments of society and preventing elites from blocking the adoption of new technologies. In general, weak property rights due to poor institutions can lead to lack of productive capacities or uncertainty of returns in an economy. Moreover, capital-labor ratios across countries might differ because of differences in cultural context and technological capacity.[16] We model these as differences in A_t, which captures overall differences in efficiency in the production across countries.[17] Hence, for countries i and j, the true return is given by,

$$A_{it}f'(k_{it}) = r_t = A_{jt}f'(k_{jt}). \tag{6}$$

2.2 International Capital Market Imperfections

2.2.1 Asymmetric Information

Asymmetric information problems, intrinsic to capital markets, can be ex-ante (adverse selection), interim (moral hazard) or ex-post (costly state verification). In general, under asymmetric information, the main implications of the neoclassical model regarding the convergence of returns and capital flows tend not to hold. In a model with moral hazard, for example, where lenders cannot monitor borrowers' investment, poor countries' per capita investment depends positively on per capita wealth. Alternatively, if foreign investors are handicapped in terms of domestic market information, they tend to underinvest. These cases all lead to higher interest rates in capital importing countries.[18]

2.2.2 Sovereign Risk

Sovereign risk is defined as any situation, where a sovereign defaults on loan contracts with foreigners, seizes foreign assets located within its borders, or prevents domestic residents from fully meeting obligations to foreign contracts.[19] The problem stems from the fact that repayment incentives for sovereign debts differ from those of a contract between two nationals because the ability of a court to force a sovereign entity to comply is extremely limited. Sovereign debtors may repay

[16] See Eichengreen (2003). Although technology is available to all countries, there might be barriers and limitations to adopt the existing technologies, or differences in the efficient use of the same technology; see Parente and Prescott (2000) and Rajan and Zingales (2003).

[17] In defining the parameter A_t, we cannot differentiate between the effect of institutions on investment opportunities versus that of total factor productivity, TFP, (i.e., A_t defined as the incentive structure that allows for innovations versus A_t defined as a productivity index). Indeed, as Prescott (1998) argues, the efficient use of the currently operating technology or the resistance to the adoption of new ones depends on the "arrangements" a society employs.

[18] See Gertler and Rogoff (1990) and Gordon and Bovenberg (1996).

[19] Lucas (1990) discusses monopoly power and capital controls, i.e., distortive government policies under capital market imperfections since he combines domestic and international capital market imperfections. Following Obstfeld and Rogoff (1995), we considered international capital market imperfections only those related to sovereign enforcement problems or those based on information asymmetries. We put all domestic distortions under fundamentals since they affect capital's productivity.

some of their debts because of the threat of future exclusion from international capital markets or direct imposition of penalties. In both cases the optimal level of borrowing and lending—and thus convergence in returns—cannot be achieved.

3 Empirical Analysis: Explaining the Lucas Paradox

Capital inflows can broadly be divided into inflows of foreign capital (inflows of equity) and loans issued between domestic residents and foreigners (inflows of debt securities). We focus primarily on inflows of foreign capital which can further be divided into inflows of portfolio and direct investment (FDI).[20] We prefer to abstract our analysis from debt inflows for the following concerns. First, consequent to the eighties debt crisis there are several measurement errors in the data. Second, in general, inflows of debt tend to be shaped by government decisions to a greater extent than inflows of capital. We, on the other hand, would like to capture market decisions since they are the relevant ones for our purposes. Finally, our focus is on capital formation, whereas debt inflows tend to be used to smooth consumption.[21] We, nevertheless, examine the role of debt inflows in our robustness section.

We use capital inflows data from three different sources. Two of our data sets are Kraay, Loayza, Serven, and Ventura (2000) (KLSV) and Lane and Milesi-Ferretti (2001) (LM). These authors construct estimates of foreign assets and liabilities and their subcomponents for different countries in the seventies, eighties, and nineties paying particular attention to the valuation effects, that are not captured in the balance of payments statistics, published by The International Monetary Fund (IMF) in the International Financial Statistics (IFS). Lane and Milesi-Ferretti (2001) found these effects to be quantitatively important for a number of countries. They estimated stocks of equity and foreign direct investment based on the IMF inflow data adjusted to reflect changes in financial market prices and exchange rates. In order to estimate FDI stocks, the authors cumulate inflows and adjust for the effects of exchange rate changes. For equity stocks, they adjust for changes in the end of year U.S. dollar value of the domestic stock market. Kraay, Loayza, Serven, and Ventura (2000), on the other hand, argue against the valuation of stocks using financial market prices. They argue that, capital listed on the stock market and the corresponding share prices—especially in developing countries—are not representative of the stock of capital of a country or

[20] When a foreign investor purchases a local firm's securities without exercising control over the firm, that investment is regarded as a portfolio investment; direct investments include greenfield investments and equity participation giving a controlling stake. The International Monetary Fund classifies an investment as direct if a foreign investor holds at least 10 percent of a local firm's equity while the remaining equity purchases are classified under portfolio equity investment. We do not distinguish between minority and majority shareholders, as this distinction is not important for our analysis.

[21] Debt data includes both private and government debt. Data on how governments allocated foreign debt is not available across countries for our sample period.

of the value of a firm. Instead, they use the price of investment goods in local currency, which is the investment deflator. They also adjust for exchange rate changes. We calculate annual net inflows of capital out of the stocks in the KLSV and LM data sets as the yearly change in the stock of foreign claims on domestic capital. This corresponds to net inflows of capital−that is, net inflows of direct and portfolio equity investment.[22] The inflows of direct investment from the IMF, IFS include reinvested earnings of foreign-owned firms (net inflows of FDI), while data on inflows of portfolio equity investment do not. As Kraay, Loayza, Serven, and Ventura (2000) point out, in principle, changes in the stock market valuation of equities will reflect these reinvested earnings while changes in the investment deflator valuation will not. Hence, KLSV procedure will underestimate the claims on portfolio equity. We believe the weakness of the stock market data for developing countries to be of greater concern and hence use KLSV data in most of our analysis. Nevertheless we also use LM data to correct for this undervaluation of the stocks of portfolio equity. Lane and Milesi-Ferretti (2001) found the correlation between first difference of foreign claims on capital and current account to be generally high but significantly below unity for several countries, confirming the importance of valuation adjustments. Nevertheless, as a further robustness we use, as our third source, capital inflows as calculated in the Balance of Payments Statistics, published by the IMF in IFS. These data correspond to inflows of direct and portfolio equity investment. Since this data does not capture the valuation effects, we can use this data to judge the importance of the valuation effects for our results. We have data for 46 countries between 1971−1997 from the KLSV data set, 57 countries between 1971−1998 from the LM data set, and 59 countries between 1971−1998 from IMF, IFS. By using long term averages of the yearly differences of the valuated stocks, we capture the adjustments in foreign investments due to changes in the exchange rate and local prices in order to achieve the optimal long run capital stock.

In all our regressions the dependent variable is the net inflows of capital (or inflows) per capita, averaged over the sample period. We believe per capita measures are more in line with the theoretical literature.[23] We use the initial level of the logarithm of GDP per capita on the right hand side in each regression as a measure for the Lucas Paradox, in other words, the positive significance of this variable demonstrates the presence of the paradox. Then we include other right hand side variables, which we group as fundamentals versus capital market imperfections. We analyze which one makes the GDP per capita variable insignificant when included, hence providing an explanation for the paradox.[24]

[22]KLSV data is in 1990 U.S. dollars. LM use real exchange rates to adjust for U.S. inflation. We converted the LM data to be in 1995 U.S. dollars.

[23]In addition a histogram revealed the fact that this measure is more normally distributed than the other potential measure, inflows/GDP.

[24]Note that upon the inclusion of the other right-hand side variable, the insignificance of the initial GDP per

The Role of Fundamentals

The right-hand side variables that we use to capture fundamentals are the initial level of the logarithm of human capital (average years of total schooling in total population) and institutional quality, averaged over the sample period. The measurement of institutional quality is a challenging task. The institutions that matter for economic performance are composed of formal and informal rules and constraints. To measure this complex web of interactions, we construct a yearly composite index using International Country Risk Guide's (ICRG) political safety variables. The composite index is the sum of the indices of government stability, internal conflict, external conflict, no-corruption, non-militarized politics, protection from religious tensions, law and order, protection from ethnic tensions, democratic accountability, and bureaucratic quality.[25]

Figure 1 plots the evolution of each component of our composite institutional quality index, averaged for all countries. It is clear that there is almost no time variation in the institutional quality index during our sample period. Figures 2a-2d plot the evolution of four specific sub-components of the composite index for developed and developing countries: government stability, internal conflict, non-corruption, and law and order. These components show no time variation for developed countries and some variation for the developing countries.[26] The improvement in the government stability and internal conflict components for developing countries during the nineties captures the political changes in Latin America and Asia, in particular in Guatemala and El Salvador, where the civil wars were ended, and in India, where government stability improved after the violence in the eighties.

Theoretical papers show that low levels of human capital and weak institutions dampen the productivity of capital. Thus, we expect these fundamental variables to be positively significant. We use additional variables on the right-hand side to capture domestic distortions associated with government policies. These are inflation volatility and capital controls both averaged over the sample period. Inflation volatility captures the macroeconomic stability.[27] Our capital controls

capita is the sufficient condition for the paradox to disappear. The neoclassical theory implies a negative relationship between the initial capital stock (or the initial output) and the future inflows only if the countries are at the same technological development level. Unfortunately data does not allow us to control for the cross-country differences in technology. Nevertheless, following the empirical growth literature, we construct a proxy measure for the international total factor productivity (TFP) differences. We use this as an additional control as shown in the robustness section.

[25]The index takes values from 0 to 76 for each country, where a higher score means lower risk. The previous ICRG classification (1982−1995) had risk of government repudiation of contracts and risk of expropriation. After 1995 these variables are reported under ICRG's Investment Profile category. We use these two variables from the older ICRG classification as robustness checks.

[26]The improvement in the government stability index for the developed countries in the last years is due to the political changes in Portugal, Spain and Greece.

[27]We also use the level of inflation and get the same qualitative results.

measure is the average of four dummy variables constructed using data collected by the IMF: exchange arrangements, payments restrictions on current transactions and on capital transactions, and repatriation requirements for export proceeds. We expect inflation volatility and capital controls to be negatively significant.

The Role of International Capital Market Imperfections

In general, it is difficult to get the appropriate information (from an investment point of view) about a country without visiting the country and hence how far that country is located could be a concern. Portfolio managers and investment bankers, who advise their clients about investing in China, for example, advertise themselves by pointing out how frequently they visit the country. As Adam Smith noted, "In the home trade, his capital is never so long out of his sight as it frequently is in the foreign trade of consumption. He can know better the character and situation of the persons whom he trusts, and if he should happen to be deceived, he knows better the laws of the country from which he must seek redress."[28] Recently, in the capital flows literature, distance has been used a proxy for the international capital market failures, mainly asymmetric information.[29] We construct a variable called distantness, which is the weighted average of the distances from the capital city of the particular country to the capital cities of the other countries, using the GDP shares of the other countries as weights.[30] We expect the distantness variable to be negatively significant.

Results

Table 1 gives descriptive statistics.[31] It is clear that there is extensive cross-sectional variation. Net inflows of capital per capita varies from -42 dollars to 197 dollars with a mean of 49 dollars. Institutional quality index varies from 34 to 73 with a mean of 55. Real GDP per capita varies from 800 dollars to 16 thousand dollars with a mean of 6 thousand dollars. Table 2 presents the correlation matrix. Some of our independent variables are highly correlated, such as GDP per

[28] Adam Smith (1976, p. 454) quoted in Gordon and Bovenberg (1996).

[29] Analyzing the equity holdings of a large sample of actively managed mutual funds in the U.S., Coval and Moskowitz (1999, 2001) find that fund managers earn substantially abnormal returns in geographically proximate investments (within a 100 kilometers of a fund's headquarters). The authors interpret the results as fund managers exploiting informational advantages in their selection of nearby stocks. Portes and Rey (2002) use a similar interpretation of distance in the context of bilateral capital flows and Wei and Wu (2002) in analyzing the determinants of FDI and bank lending.

[30] We construct this variable following Kalemli-Ozcan, Sorensen, and Yosha (2003a). We use Arcview software to get latitude and longitude of each capital city and calculate the great arc distance between each pair. The GDP weights capture the positive relation between trade volume and GDP.

[31] All data is described in detail in Appendix B.

capita and human capital, and GDP per capita and institutional quality. Hence, it is essential that we seek the effect of each variable one at a time to see which one will be picked up by the data.

Table 3 shows our main result. Institutional quality is the most important variable that explains the Lucas paradox. Column (1) demonstrates the Lucas paradox; capital flows to rich countries. In column (2) we add human capital. Although it enters positively and significantly, it can not account for the paradox.[32] In column (3) we take out human capital and add institutional quality instead. Upon this addition, we see that Lucas paradox disappears. In fact, only in the regressions that are shown in column (3) and columns (5) through (8), where the institutional quality is included on its own or together with the other explanatory variables, GDP per capita becomes insignificant. Note that we are capturing the direct effect of institutional quality on capital inflows. However, GDP per capita can also depend on institutional quality, creating an indirect effect. Indeed, the correlation between these two variables is very high. However, upon the inclusion of institutions, GDP per capita becomes insignificant, hence the institutional quality is the "preferred" variable by the data. In column (4) we add distantness on its own. It has the expected sign but it is not significant. Column (6) thorough (8) add inflation volatility and capital controls. They have the expected signs, though they are insignificant. The institutional quality variable, on the other hand, is robust to the inclusion of these other right-hand side variables. It is significant at the 1 % level in all specifications.

Figure 3 plots the residuals from the regression of net inflows of capital per capita on the right-hand side variables except institutions against the residuals from the regression of institutions on the other right-hand side variables. The slope of the fitted line is 3.29 as shown in column (8) of Table 3.[33] The strong positive relation between the institutional quality index and the net inflows of capital per capita is evidently not due to the outliers.[34]

The effect of institutions is also economically significant; if we move up from the 25 percentile to the 75 percentile in the distribution of the institutional quality variable, we have 70 dollars more inflows per capita over the sample period on average. This represents a 44% increase in net inflows per capita over the sample mean, which is 49 dollars, hence it is quite an effect. Moving up from the 25 percentile to the 75 percentile in the distribution of the institutional quality variable represents a move from a country such as Turkey to a country such as U.K.

[32] We repeat the analysis using average years of higher schooling instead of total schooling in total population as the measure human capital. In this case human capital is still significant in all the specifications, though it still cannot account for the paradox.

[33] We first regressed net inflows of capital per capita on GDP per capita, human capital, distantness, inflation, and capital controls. We took the residuals and regressed them on the residuals from a regression of institutional quality on the other regressors. Frisch-Waugh theorem says the coefficient from this regression is exactly the same as the one in the multiple regression. The figure plots these two sets of residuals against each other.

[34] The second fitted line denotes a regression without Trinidad and Tobago. Institutional quality index has a coefficient of 2.68 and a t-stat of 3.58 in this regression.

We repeat the analysis using capital stock per capita instead of GDP per capita as a measure of the Lucas paradox.[35] We use the 1970 value of the domestic capital stock per capita since this will be the relevant value for the future inflows. As shown in Table 4, the results are very similar. Institutional quality remains the main explanation for the Lucas paradox. In this case, human capital seems to play a lesser role.

Table 5 repeats the analysis for the decades in our sample period, 1971−1997. Institutional quality remains the main explanation for the Lucas paradox for the different decades and subperiods, as shown in columns (1) to (5). For 1971−1980 and 1980−1990, as shown in columns (1) and (2), the institutional quality variable is significant at the 5% level.[36] Notice that the ICRG data, hence our composite institutional quality index starts in 1984. As shown in Figures 1 and 2, our composite index does not change much over our sample period. Thus we can use the average value of the index for these decades. To be cautious, however, we use the sub-components of the composite index, with no time variation at all, as the measures of institutional quality for these decades. They deliver similar results. We report the results with the law and order component. Hence, the first two columns of Table 5 use the law and order index instead of the composite index as the measure of institutional quality. The institutional quality variable is highly significant for the periods 1985−1995 and 1990−1997 as shown in columns (3) and (4), respectively. Finally, as column (5) shows, the results are robust to the exclusion of the last two years, which corresponds to the Asian crisis period.

3.1 Robustness

How Robust is the Role of Institutional Quality?

The institutional quality variable is a composite index of the political safety components. We use each component of this index independently to see which ones are driving the result. We report the results in Table 6. Government stability, internal conflict, non-corruption, law and order, democratic accountability, and bureaucratic quality, as shown in columns (1) through (6), seem to be important determinants of capital inflows.[37] Other components such as external conflict,

[35] Neoclassical theory suggest that capital will flow from the capital abundant country to the capital scarce country. From another point of view, this exercise can also be viewed as evidence for the presence of externalities in the localization of production; capital goes where capital is.

[36] We conjecture that the lower significance of the institutional quality variable during the eighties can be accounted by the general cutoff of lending in the international capital markets following Mexico's announcement to halt foreign interest payments on August 15, 1982, which marked the beginning of the international debt crisis. As Eichengreen and Lindert (1989) observe, during the eighties private creditors tended to withhold capital from potential borrowers in all developing countries, not just the conspicuous problem debtor countries.

[37] Note that the significance of the human capital variable decreases, when our institutional quality indicators are closer proxies of property rights protection, such as the no-corruption index or protection from expropriation. This

non-militarized politics, and protection from religious tensions turn out to be insignificant.[38] We further test the robustness of our results using protection from government repudiation of contracts and from risk of expropriation, which are other well known measures of institutional quality. As shown in columns (7) and (8), these measures are highly significant.[39]

Other Measures of Fundamentals

An additional concern is that our results might be driven by capital account liberalization. Recently "opened up" economies like East Asian countries might be a group of outliers, who are driving the results. In order to see if this is the case, we plot the country names in Figure 3. It is clear from the figure that our results, on the contrary, are driven by the countries, which typically, ceteris paribus, have very high levels of institutional quality, such as Denmark, Sweden, Norway, and U.K. As a further test we construct a variable called removal of capital controls. We first difference our yearly capital controls measure, then average these differences over the sample period and subtract it from one. Hence, this variable on average should be greater than one for countries that liberalized over the sample period. As seen in column (1) of Table 7, upon the addition of this variable, institutional quality remains positive and significant. Moreover, as expected, the removal of the capital controls variable is associated with higher net inflows of capital per capita.

Another variable that might have a role is trade.[40] As shown in column (2), our results are robust to the inclusion of the initial value of the trade variable defined as the sum of exports and imports as a share of output. The institutional quality variable remains highly significant. Trade, however, has no effect.[41]

We also add corporate income tax as another policy variable since the lack of flows can be due to heavy taxation. As shown in column (3), our results are robust to the inclusion of this variable. As expected corporate taxes have a negative effect. Institutional quality remains positive

suggests that property rights protection plays a particularly important role in explaining the lack of flows from rich to poor countries. Recently, Acemoglu and Johnson (2003) explore the importance of what they label "property rights institutions," those which protect citizens against expropriation by the government and the elites; and "contracting institutions," those which enable private contracts between citizens. They find that property rights institutions have a first-order effect on long-run growth, investment, and financial development.

[38] t-ratios of 0.91, 1.13 and 0.96 respectively.

[39] The results are also robust to the inclusion of linguistic ties defined as the fraction of the population that speaks English or any one of the five primary West European languages. These variables have also been used in the literature as indirect measures of institutions. They enter insignificantly and they do not affect other coefficients. We, therefore, do not report the results. Appendix B reports further robustness results for institutions.

[40] Mundell (1957) shows commodity movements and factor movements to be substitutes. Markusen (1983) and Svensson (1984) show that, whether trade and factor mobility are complements or substitutes, depends on the assumptions made with respect to factor intensities, technology, and preferences.

[41] Lane (2000) finds a positive association between trade openness and the level of external debt. He argues that this result supports theories of constrained access to international credit markets.

and significant. Columns (4) and (5), respectively, test for the effects of restrictions and incentives to FDI. The restriction index is the sum of four dummies for exchange controls, exclusion of foreign firms from certain strategic sectors, exclusion of foreign firms from other non-strategic sectors, and restriction on the share of foreign ownership. Since this variable includes a capital controls component, we use this index without our capital controls variable. The incentive index is a dummy for incentives for foreigners to invest in specific industries or geographic areas.[42] As expected, incentives have a positive effect attracting capital inflows, while restrictions a negative; the results, however, are not significant. The role of institutional quality, on the other hand, remains positive and significant.

As seen in column (6), the results are robust to using variables that proxy government infrastructure, mainly public goods. We use the percentage of paved roads in total roads, averaged over the sample period, as a measure of infrastructure. Because of complementarities between public and private capital, the former can be considered another omitted factor of production that affects the productive opportunities in an economy. The effect of this variable is positive, but not significant.

We also use financial market development as another variable that represents good domestic fundamentals. In theory, higher levels of financial development lead to higher productivity of capital.[43] We try several standard measures of credit market development, namely liquid liabilities of the financial system, total credit to private sector, and credit by deposit money banks to private sector (all as shares of GDP, averaged over the sample period). Bank credit delivers the only significant result as shown in column (7). We also try measures of capital market development. We use stock market capitalization (shown in column (8)) and total value traded on the stock market (as shares of GDP, averaged over the sample period). Both turn out to be insignificant. Inclusion of these measures together with the credit market variables and/or on their own did not change the overall picture.[44]

Another concern is about the role total factor productivity (TFP) differences across countries. As explained before, it is hard to separate the effects of the incentive structure (institutions) on

[42] We also used the other incentive variables, namely tax concessions, non-tax concessions, special promotion for exports and got similar results. These indices were coded by Wei (2000) following a detailed description compiled by PriceWaterhouseCoopers. Corporate tax rate is also from Wei (2000). Unfortunately these variables are available only for one year, where that year changes between 1990−1997 from country to country.

[43] Note that financial market development can also be considered a measure of asymmetric information as it mitigates information problems. In a standard frictionless general equilibrium model a la Arrow-Debreu financial intermediaries are redundant. Information asymmetries or transaction costs are required to justify the existence of financial intermediaries.

[44] The negative significant coefficient delivered by the bank credit measure is rather unusual. We hypothesize the following: financial market development is composed of two components; strong financial institutions and high domestic investment, which are proxied mostly by the bank credit. The institutions part is captured by our institutional quality variable. The high domestic investment part giving rise to a crowding out effect, i.e., foreign investment will not come since all investment opportunities are exhausted domestically. This result, however, is not robust using other indices of financial market development.

the adoption of new technologies from the TFP itself. Hence it might be the case that our institutional quality variable is a proxy for TFP differences. However, we do not have a good measure that captures international TFP differences given the fact that technology can be transferred and imitated. Hence the empirical literature on growth tends to calculate TFP measures as a residual of growth rates minus factor accumulation weighted by their relative contribution to production. We also construct a similar proxy variable for TFP by solving for A in equation (1) and assuming the value of $\alpha = 1/3$. We also calculate TFP growth rates calculated as the growth rate of per capita output minus one third of the growth rate of the per capita capital stock. We calculate both of these variables for every year and every country in our sample period. As seen in column (9), initial level of TFP growth has a positive and insignificant effect. Our institutional quality variable remains positive and significant.[45]

We also experiment with some other variables for fundamentals. For example, we use land since it can be another omitted factor of production such as human capital and hence countries with less land may have low marginal productivity of capital. This variable turns out to be insignificant and thus we do not report the results. We also use ratio of external debt to GDP, which turns out to be negatively insignificant, and hence not reported. Our capital control measure is an average of four dummy variables as explained before. We try two of these measures on their own: restrictions on payments for capital transactions and surrender or repatriation requirements for export proceeds. The results are qualitatively the same and hence not reported.

Other Measures of Market Imperfections

To test the robustness of the results obtained using the distantness variable as a measure of asymmetric information, we try several other measures for asymmetric information. First as shown in column (1) in Table 8, we use distantness as weighted by population instead of GDP. The results are the same as before. We then replace this measure with a variable called Reuters. This is the number of times the country is mentioned in Reuters. This measure should potentially reflect the international business community's awareness about the country that they are investing in. The sign is positive, but the coefficient is not significant. Then we try foreign banks (share of foreign banks with at least 10% of foreign capital in total banks) and accounting practices (an index for the degree of transparency in accounting) as alternative measures of asymmetric information. Both enter with correct signs but are not significant.[46]

[45] The results with the initial level of TFP are qualitatively the same. We also use both initial level and the growth rate of TFP together with the other measure of the paradox, namely the capital stock per capita and got similar results.

[46] We also try share of foreign banks with 50% of foreign capital and got similar results. Note that this variable

We also use the sovereign debt ratings, from Standard and Poor's (S&P), as a measure of sovereign risk. These data reflect the assessment of each government's capacity and willingness to repay debt according to its terms. S&P's appraisal of each sovereign's creditworthiness is based on economic and financial performance and political factors. They observe that "willingness to repay is a qualitative issue that distinguishes sovereigns from most other types of issuers. Partly because creditors have only limited redress, a government can (and does) default selectively on its obligations, even when it possesses the financial capacity for timely debt service." Thus, although this measure is highly correlated with the ICRG variables, their objective and methodology are quite different. In order to eliminate any possible perception bias, ICRG does not use any outside expert opinion, such as influential investors who might have assets in the rated country. S&P, on the other hand, relies on this from time to time. This variable turns out to be negative and significant. Our institutional quality variable is robust to the inclusion of the sovereign risk variable.

Other Ways of Calculating Capital Inflows

In Table 9, we use the stock estimates from the LM data set. As before, we calculate net inflows of capital as the difference in these stocks. The results are qualitatively the same with the exception of distantness, which is now negative significant. However, human capital is not significant when we use all of the explanatory variables together. In column (7) we add data on net inflows of loan liabilities, which are calculated as the difference in stocks of the portfolio debt liabilities and other investment liabilities.[47] Institutions remain robust to all these modifications.

Until now we have calculated net inflows of capital (portfolio and direct investment) as the change in the stock of foreign claims on domestic capital. We repeat the analysis using capital inflows from the Balance of Payments Statistics of IMF, as given in IFS, specifically, inflows of direct and portfolio equity investment. We have data for 59 countries between 1971−1998. The results are given in columns (1) through (6) of Table 10. Institutional quality remains the main explanation for the paradox.[48]

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can also be picking up government policies as some governments have placed restrictions on foreign bank ownership. Of course foreign bank ownership is an endogenous variable so the results need to be interpreted with caution.

[47] As Lane and Milesi Ferretti (2001) note, for developing countries there are discrepancies between the loan flows reported in the IMF Balance of Payments Statistics and the changes in external debt stocks as reported by the World Bank's Global Development Finance Database. The latter data, however, is available only for developing countries. There are no comparable estimates of gross debt position for industrialized countries to those of developing countries, which adjust for cross-currency fluctuations.

[48] We also control for the price of investment goods and domestic stock prices in the country. Both these variables are indices relative to U.S and they are unit free. The purpose of this exercise is to try to mimic the valuation effect, that we have in our main data sets. Both of these variables enter insignificantly. We do not report these results due to space considerations.

3.2 Endogeneity Issues

So far there has been no discussion of the endogeneity problem. Theoretically it is possible that the capital inflows affect the institutional quality of a country. More inflows can generate incentives to reform and create an investor friendly environment by improving property rights.[49] Moreover most institutional quality measures are constructed ex-post, and the analysts may have had a natural bias in 'assigning' better institutions to countries with higher growth rates and/or higher capital inflows. One way to solve this problem is to find variables that are not subject to reverse causality and can account for the institutional variation.

La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1997, 1998) emphasize the importance the legal origin on the current institutions. They examine the laws governing investor protection, the enforcement of these laws, and the extent of concentration of firm ownership across countries (more popularly known as the LLSV variables). They find that countries with different legal histories offer different types of legal protection to their investors. Most countries' legal rules, either through colonialism, conquest, or outright borrowing, can be traced to one of four distinct European legal systems: English common law, French civil law, German civil law, and Scandinavian civil law. They show that countries whose legal rules originate in the common law tradition offer the greatest protection to investors. As far as law enforcement is concerned, German civil law and Scandinavian civil law countries emerge superior. The French civil law countries offer both the weakest legal protection and the worst enforcement. These legal origin variables have been increasingly adopted as exogenous determinants of institutional quality in the economic growth literature. We also use these legal origins as instruments for institutions.

In contrast, Acemoglu, Johnson, and Robinson (2001, 2002) emphasize the conditions in the colonies. They argue that it is not the identity of the colonizer or the legal origin what matters, but whether the European colonialists could safely settle in a particular location. If the European settlement was discouraged by diseases or where the surplus extraction was beneficial via an urbanized and prosperous population, the Europeans set up worse institutions. Thus, they argue that historical mortality rates of European settlers are good instruments for today's institutions. We also use European settler mortality rates as an instrument for institutions. However, we do this in a smaller sub-sample of 26 countries since given the nature of our sample—which includes industrialized countries—we cannot use these rates as an instrument for the whole sample. In order to take into consideration local conditions when creating institutions in our original sample, we complement legal origins indicators with variables from Berkowitz, Pistor, and Richard (2003). These variables are mainly corrections for the familiarity with the adopted legal origin. They analyze

[49] See Gourichas and Jeanne (2003) and Rajan and Zingales (2003).

the determinants of effective legal institutions and test the proposition that, the way in which the legal order was transplanted (demand) is more important than the supply of the law (legal origin). They find that countries that developed legal orders or had a population familiar with the law had more effective legality. Based on Berkowitz, Pistor, and Richard (2003) we construct a variable called "familiarity," which considers whether a country is the origin of the legal family or exhibited familiarity with the imported law. We use this variable as an instrument for institutions together with legal origin variables.

We complement these instruments with early indicators of regime type and political constraints to the executive power from the Polity data set, which we use as proxies for whether the political institutions impose restrictions on the state. In order to avoid any effect on capital inflows other than through institutions we used indicators for 1900. The recent values of these variables were used as alternative measures of institutional quality in this paper as shown in Appendix A.

Table 11 presents the results of the first stage regressions. Table 12 reports the corresponding second stage regressions together with corresponding OLS counterparts. Thus, column (1) in Table 12 reports the results of the IV regression, estimated by 2SLS, using the logarithm of settler mortality rates together with the polity data set variables as instruments. Column (2) adds fraction of the population speaking English.[50] Column (3) uses familiarity with the legal code together with the legal origin variables.[51] Columns (4) and (5) add the polity data set variables together with the fraction of the population speaking English.[52] In all of these IV specifications, the institutional quality variable is always positive and significant with a coefficient similar to the one in the OLS regressions, as reported in the last 2 columns for comparison.[53]

3.3 Historical Evidence: 1918-1946

We obtained data on capital inflows from the League of Nations Balance of Payments for the period between 1918−1948 for 15 countries. Despite the limited sample, this analysis provides a historical perspective to our examination of the determinants of the Lucas Paradox.

The literature characterizes different periods in terms of the evolution of capital mobility. There

[50] Hall and Jones (1999) used this latter variable as an instrument for what they called as social infrastructure. They proxy social infrastructure by combining ICRG rates on (i) law and order, (ii) bureaucratic quality, (iii) corruption, (iv) risk of expropriation, and (v) government repudiation of contracts with a measure of openness to trade. However, note that English language may also be considered as a proxy for asymmetric information.

[51] We drop the English and Scandinavian legal origins since they are insignificant when used alone.

[52] We also used a variable called "State Antiquity" as an instrument. This is an index constructed by Bockstette, Chanda, and Putterman (2002) that shows the in-depth experience of a country with state level institutions. They show state antiquity to be significantly correlated with measures of political stability and institutional quality. The results are similar to the ones in column (5).

[53] Note that somewhat larger coefficient is normal given the dummy nature of the instruments except the mortality rate. We also test for the validity of the instruments and the data easily passes this test.

was an upswing in capital mobility from 1880 to 1914 during the Gold Standard period. Before 1914 capital movements were free and flows reached unprecedented levels. The international financial markets broke up during World War I. Starting in 1920 policymakers around the world tried to reconstruct the international financial markets. Britain returned to gold in 1925 and led the way to restoring the international gold standard for a limited period and this was followed by a brief period of increased capital mobility between 1925 and 1930. As the world economy collapsed into depression in the thirties, so did the international capital markets. World War II was followed by a period of limited capital mobility. Capital flows began to increase starting in the sixties, becoming faster in the seventies after the demise of the Bretton Woods system.[54]

In this section, we analyze the interwar period and study the determinants of capital inflows between 1918−1946. We also analyze the period pre−Great Depression period (1918−1929) and Great Depression−War Period (1929−1946) and the years of 1925−1929 when most countries returned to the Gold Standard following Great Britain. We obtain similar results from all these sub-periods and hence we report the results for the full sample only. We run an OLS regression using as dependent variable the average annual capital inflows per capita. Table 13 presents the basic results. In this case, we have much lower levels of significance than the conventional levels due to our small sample size. Column (1) suggests that capital flows to rich countries, although GDP per capita is significant only at the 15% level. Column (2) shows that human capital accounts for the Lucas paradox. The variable distantness is constructed as before and it proxies transaction costs of information flows limitations. Column (3) shows that it enters insignificantly. We also use telegraph communications per capita and mail per capita as proxies for asymmetric information obtaining similar results to those delivered by the distantness variable. As discussed before, the French civil law countries offer both the weakest legal protection and the worst enforcement. Hence we include a dummy for French legal origin as the measure for institutions in column (4). This variable has a negative and significant role as a determinant of capital inflows and also can partly account for the paradox. As a results, in the period of 1918−1946, human capital has an important role in accounting for the Lucas paradox together with institutional quality. Nevertheless, this period needs further exploration by using additional data.

4 Conclusion

Our objective in this paper has been to analyze empirically the role of different theoretical explanations behind the lack of flows of capital from rich countries to poor ones. We undertake a systematic empirical study to evaluate the role of the alternative explanations behind the Lucas

[54] See Obstfeld and Taylor (2002), Eichengreen (2003) and Clemens and Williamson (2003).

Paradox, which include differences in fundamentals versus capital market imperfections.

Our empirical evidence shows that for the period 1971−1998, institutional quality is the most important variable explaining the Lucas paradox. The results are robust to the consideration of the omitted variables and the endogeneity issues. Human capital−and to some extent asymmetric information and government policies−do also have a role as determinants of inflows but they cannot account for the paradox fully on their own. We find that variables such as government stability, bureaucratic quality, non-corruption, and law and order play a particularly important role in explaining the lack of flows to poor countries.

The Lucas Paradox has received a lot of attention as the different explanations behind the puzzle have different and sometimes opposite policy responses. For example, if human capital plays an important role in explaining the Lucas paradox, transfers of capital goods from rich to poor countries would be offset by reductions in private foreign investment or increases in the poor country's investment abroad. Asymmetric information view, on the other hand, implies that external debt crowds out investment by lowering the collateralizable wealth of domestic entrepreneurs. Our results suggest that policies aimed at strengthening property rights and improving institutions should be at the top of the list of policy makers seeking to increase capital inflows to poor countries. This of course is not an easy task.

Although our work demonstrates the importance of institutions for capital inflows, it is silent on the broader question of the welfare and growth effects of capital inflows. These issues have been investigated extensively in the literature.[55] Recent work suggests that institutions also matter for the effectiveness of capital inflows on growth.[56] Thus, better institutions are important not only to attract foreign capital but also to enable host economies to maximize the benefits of such investments.

[55]See Eichengreen (2003); Gourinchas and Jeanne (2003); Razin and Yuen (1994).
[56]See Alfaro, Chanda, Kalemli-Ozcan, and Sayek (2003) and Klein (2003).

Appendix A: Additional Robustness for Institutions

Although the ICRG variables are most widely used indicators of institutions, the Polity data set variables constructed by Gurr (1974) have also been used in the literature recently.[57] These variables, which include indicators of political authority for a wide range of countries, are used to proxy the state's autonomy (restrictions to the power of the state) and capacity (effectiveness). Researchers argue that given the state's legitimate use of force, one of its central functions is to protect property rights. However, secure property rights would in turn imply restrictions on the state's ability to use its force: "establishing a credible commitment to secure property rights over time requires either a ruler who exercises forbearance and restraint in using coercive force, or the shackling of the ruler's power to prevent arbitrary seizure of assets."[58] A critical role of the political institutions is then to place restrictions on the state in order to produce rules that foster long-term growth. Furthermore, "good institutions" are also those that prevent the elites from monopolizing the power and preventing the adoption of alternative technologies. We use the Polity data set variables as proxies for whether the political institutions impose restrictions on the state and the elites.

We report the results in Table 14. Column (1) uses competitiveness of participation (the extent to which non-elites have access to the institutional structure of political expression); column (2) uses regulation of participation (development of institutional structure for political expression) and column (3) uses a measure of institutional independence of the chief executive (monocratism). Columns (1), (2) and (3) use the average values of these variables over the 1984−1997 period to be comparable with ICRG variables. However polity data is available throughout our sample period. Hence columns (4), (5) and (6) use the average values of the same variables over the sample period 1971−1997. The results are similar. They are significant at the 10% or 15% levels throughout.[59] These political indicators are most likely capturing the indirect effect of political constraints on institutional quality (institutions that secure property rights are those that allow the state to credibly commit to upholding property rights and monitor and enforce contracts) while ICRG variables are reflecting the more direct effect of secure property rights.

[57] See Acemoglu, Johnson, and Robinson (2002) and Acemoglu and Johnson (2003).
[58] North (1995, p101).
[59] Other variables from this data set, such as constraints on the executive, were also significant at 15%.

Appendix B: Data

Countries

Cross-Country Sample of 46 countries (for KLSV data): Argentina, Australia, Austria, Bolivia, Brazil, Canada, Colombia, Costa Rica, Germany, Denmark, Dominican Republic, Ecuador, Spain, Finland, France, United Kingdom, Greece, Guatemala, Honduras, Indonesia, India, Ireland, Israel, Italy, Jamaica, Japan, Korea, Sri Lanka, Mexico, Malaysia, Netherlands, Norway, New Zealand, Pakistan, Peru, Philippines, Portugal, El Salvador, Sweden, Thailand, Trinidad and Tobago, Tunisia, Turkey, United States, Venezuela, South Africa.

Cross-Country Sample of 44 countries (for Capitalization): 46 country sample without Dominican Republic and El Salvador.

Cross-Country Sample of 44 countries (for Trade): 46 country sample without Germany and New Zealand.

Cross-Country Sample of 44 countries (for Sovereign Risk): 46 country sample without Honduras and Sri Lanka.

Cross-Country Sample of 39 countries (for Government Infrastructure): Argentina, Australia, Austria, Bolivia, Brazil, Canada, Colombia, Costa Rica, Germany, Denmark, Dominican Republic, Ecuador, Finland, France, United Kingdom, Greece, Guatemala, Honduras, Israel, Italy, Jamaica, Japan, Sri Lanka, Mexico, Malaysia, Netherlands, Norway, New Zealand, Pakistan, Peru, Philippines, El Salvador, Sweden, Trinidad and Tobago, Tunisia, Turkey, United States, Venezuela, South Africa.

Cross-Country Sample of 32 countries (for Corporate Taxes, Restrictions and Incentives): Argentina, Australia, Austria, Brazil, Canada, Colombia, Germany, Denmark, Spain, Finland, France, United Kingdom, Greece, Indonesia, India, Ireland, Israel, Italy, Japan, Korea, Mexico, Malaysia, Netherlands, Norway, New Zealand, Philippines, Portugal, Sweden, Turkey, United States, Venezuela, South Africa.

Cross-Country Sample of 31 countries (for Accounting Standards): Argentina, Australia, Austria, Brazil, Canada, Colombia, Germany, Denmark, Spain, Finland, France, United Kingdom, Greece, India, Israel, Italy, Japan, Korea, Mexico, Malaysia, Netherlands, Norway, New Zealand, Peru, Philippines, Portugal, Thailand, Turkey, United States, Venezuela, South Africa.

Cross-Country Sample of 59 countries (for IMF Data): Argentina, Australia, Austria, Belgium-Luxembourg, Bolivia, Brazil, Botswana, Canada, Switzerland, Chile, China, Colombia, Costa Rica, Germany, Denmark, Dominican Republic, Ecuador, Egypt, Spain, Finland, France, United Kingdom, Greece, Guatemala, Indonesia, India, Ireland, Iceland, Israel, Italy, Jamaica, Jordan, Japan, Korea, Kuwait, Sri Lanka, Mexico, Malaysia, Netherlands, Norway, New Zealand,

Pakistan, Peru, Philippines, Portugal, Paraguay, El Salvador, Sweden, Syria, Thailand, Trinidad and Tobago, Tunisia, Turkey, Uruguay, United States, Venezuela, South Africa, Zimbabwe.

Cross-Country Sample 57 countries (for LM Data): Argentina, Australia, Austria, Belgium-Luxembourg, Bolivia, Brazil, Botswana, Canada, Switzerland, Chile, China, Colombia, Costa Rica, Germany, Denmark, Dominican Republic, Ecuador, Egypt, Spain, Finland, France, United Kingdom, Guatemala, Indonesia, India, Iceland, Israel, Italy, Jamaica, Jordan, Japan, Korea, Kuwait, Sri Lanka, Mexico, Malaysia, Netherlands, Norway, New Zealand, Pakistan, Peru, Philippines, Portugal, Paraguay, El Salvador, Sweden, Syria, Thailand, Trinidad and Tobago, Tunisia, Turkey, Uruguay, United States, Venezuela, South Africa, Zimbabwe.

Dependent Variable

Inflows of Capital: 1971-98, Data on inflows of capital (equity) include inflows of direct and portfolio equity investment from the IMF, International Financial Statistics (lines 78bed and 78bmd respectively). Inflows are expressed in constant 1995 U.S. dollars. Direct investment (line 78bed) includes equity capital, reinvested earnings, other capital and financial derivatives associated with various intercompany transactions between affiliated enterprises. Excluded are inflows of direct investment capital into the reporting economy for exceptional financing, such as debt-for-equity swaps. Equity Liabilities (line 78bmd) include shares, stock participations, and similar documents that usually denote ownership of equity.

Stocks of Foreign Capital (KLSV): 1970-97, Foreign claims on domestic capital in 1990 constant U.S. dollars, from Kraay, Loayza, Serven, and Ventura (2000). The authors construct estimates of stocks of foreign capital using initial stocks and inflows of direct and portfolio investment and adjust the capital stock to reflect the effects of changes in market prices and exchange rates according to $S_{it} = V_{it}S_{it-1} + F_{it}$, where S_{it} denotes the initial stock of the asset in country i at the end of period t in constant 1990 U.S. dollars; F_{it} the inflow of new investment in constant 1990 U.S. dollars; and V_{it} the gross change between periods *t-1* and t in the value of the asset. The gross change in the value of the asset was calculated using $V_{it} = (1-\delta)\frac{P_{t-1}}{P_t}\frac{e_{it}}{e_{it-1}}\frac{P^I_{it}}{P^I_{it-1}}$; where $\delta = 0.6$ is the depreciation rate; P_t is the U.S. price level; e_{it} is the exchange rate in local currency units per U.S. dollars; and P^I is the investment deflator in country i at time t. The authors argue that in principle, one would like the capital stock to be measured at market value. An obvious choice would be to proxy changes in the value of capital by changes in a share price index. The authors argue against this because capital listed on the stock market, especially in developing countries, is not representative of the stock capital as a whole. Moreover, in thin markets, the link between changes in share prices and the underlying value of firms is tenuous. Thus, the authors consider replacement cost, and proxy changes in this by the change in the local currency investment deflator.

For depreciation, they use the average value of 6 percent used by Summers and Heston. Data on initial stocks were taken from the IMF, Balance of Payments Statistics and OECD's (1972) "Stocks of Private Direct Investment by DAC countries in Developing Countries End 1967." For countries for which no stock information is available in any of these sources, they infer initial stocks as the ratio of the flow of investment in that asset relative to the gross domestic investment, multiplied by the domestic capital stock obtained above. In order to smooth out year-to-year deviations, they use the average investment ratio in the first three years for which flow data is available. In most cases for portfolio equity investment, the observed initial flows are zero, and so this results in an estimate of a zero initial stock, which is probably correct. Inflows data on direct investment and portfolio equity liabilities were taken from IMF, IFS statistics as described above.

Stocks of Foreign Capital (LM): 1970-98, Foreign claims on domestic capital, from Lane and Milesi-Ferretti (2001). We converted the data to be in 1995 constant U.S. dollars. The authors construct estimates of stocks of equity and foreign direct investment using initial stock data and inflow data adjusted to reflect the effect of changes in market prices and exchange rates.

Stock measures of Portfolio Equity (EQL) are constructed based on cumulative equity inflows, taken from the IMF's IFS and BOPS. For equity inflows, Lane and Milesi-Ferretti adjust the stock outstanding at the end of year *t-1* for changes in the value of the stock market in U.S. dollar terms between the end of the year *t-1* and the end of the year (market value). The flows are assumed to occur uniformly during the year and thus their end of year value was calculated by multiplying them by the ratio of the stock market value in U.S. dollars at the end of the year (p*) over its average during the year ($\bar{p}*$). Hence, $EQL_t = EQL_{t-1}\frac{p*_t}{p*_{t-1}} + \Delta EQL_t\frac{p*_t}{\bar{p*}_t}$. Inflows data on portfolio equity liabilities were taken from IMF, IFS statistics as described above. Stock measures are taken from the International Investment Position (IIP) data published by BOPS and IFS.

The stock value of Foreign Direct Investment liabilities (FDIL) is obtained by cumulating the dollar amount of yearly inflows (including reinvested profits) adjusted for variations in the price of capital. Instead of assuming that FDI is in the form of investment in some standardized "machinery" whose price in dollar terms follows the price of capital in the U.S. (i.e. the price of capital goods increases at the same rate regardless of location), the authors assume that capital goods are closer to non-traded goods and that the relative price of investment goods across countries follows relative CPIs. These assumptions imply that the change in the domestic price of capital goods is the sum of the change in the relative price of capital between the country and the U.S. (the currency of denomination of flows), plus the increase in the U.S. price of capital; $FDIL_t = FDIL_{t-1}\frac{rerus_t}{rerus_{t-1}}(1+\pi^k_t) + \Delta FDIL_t$, where *rerus* is the country's real exchange rate vis-a-vis the US dollar, and an increase measures an appreciation; and $\pi^{\mathbf{k}}$ is the rate of change of the price of capital in U.S. dollars. The estimates of stocks of FDI according to this methodology,

however, can overstate the actual stock of FDI because a) write-offs of existing capital are not taken into account[60] and b) given accounting practices, in the presence of inflation, nominal depreciation allowances imply that part of reinvested profits are offsetting real capital depreciation and should not be counted as capital. The inflation adjustment to the stock implies instead that each dollar of reinvested profits is calculated in "real" terms. In order to address these problems, the authors compute the measure of FDI capital based on the above formula but without any correction for inflation in capital goods' prices, $FDIL_t = FDIL_{t-1}\frac{rerus_t}{rerus_{t-1}} + \Delta FDIL_t$. Inflows data on direct investment were taken from IMF, IFS statistics as described above. The initial values for stocks were taken from from the IMF, Balance of Payments Statistics, OECD's (1972) "Stocks of Private Direct Investment by DAC countries in Developing Countries End 1967" and Sinn (1990) "Net External Asset Position of 145 Countries: Estimation and Interpretation." When stocks were unavailable, the authors use cumulative inflows using data back to the 1950s.

Stocks of Debt Liabilities (LM): 1970-98, Debt liabilities, from Lane and Milesi-Ferretti (2001). We converted the data to be in 1995 constant U.S. dollars. Estimates are based on stock measures, when available, supplemented with cumulative debt inflows. Stocks of loan liabilities are composed of stocks of portfolio investment debt liabilities and other investment liabilities. Stock measures of debt liabilities for industrial countries are reported in the International Investment Position (IIP) data (published in BOPS and IFS). In the absence of such data, the authors use cumulated debt inflows. The authors also collected BIS data on debt to banks by country's residents. For developing countries, they use data on gross debt reported by the World Bank and the OECD/BIS. Inflows of portfolio investment liabilities (one 78bgd) include transactions with nonresidents in financial securities of any maturity (such as corporate securities, bonds, notes and money market instruments) other than those included in direct investment, exceptional financing and reserve assets. Other investment assets (line 78bid) include all financial transactions not covered in direct investment, portfolio investment, financial derivatives or other assets. Major categories are transactions in currency and deposits, loans and trade credits.

Independent Variables

Accounting Standards: 1990, index created by examining and rating companies 1990 annual reports in their inclusion of 90 items in balance sheets and income statements. The index ranges from 0 to 90. The index is published by the Center for International Financial Analysis and Research Inc., from La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1998).

Bank credit: 1971-97, Claims on private sector by deposit money banks as share of GDP, from Beck,

[60] Notice that the formula does not include a depreciation term or allowances for when a machine becomes obsolete.

Demirguc-Kunt, Levine (2000).

Capital controls: 1971-97, The mean value of four dummy variables: 1) Exchange Arrangements: separate exchange rates for some or all capital transactions and/or some or all invisibles; 2) Payments Restrictions: restrictions on payments for current transactions; 3) Payments Restrictions: restrictions on payments for capital transactions; 4) Surrender or Repatriation Requirements for Export Proceeds. From International Monetary Fund, Annual Report on Exchange Arrangements and Exchange Restrictions.

Removal of capital controls: 1-average (1972-1997) yearly differences of the capital controls index.

Capital Stock, domestic: 1970, Domestic capital stock including gold reserves per capita in 1970 expressed in constant 1990 U.S. dollars, from Kraay, Loayza, Serven, and Ventura (2000). See above explanation for this data set.

Corporate Taxes: 1990-97, Corporate tax rates from PricewaterhouseCoopers (PwC), taken from Wei (2000).

Distance: Km., from Arcview 3.x software.

English-fraction: Fraction of the population speaking English as a mother tongue, from Hall and Jones (1999).

Foreign Banks: 1991-98, Share of banks in total with at least 10% of foreign capital, from The Bankers Almanac, BANKbase CD-ROM.

GDP per capita: 1971-97, Purchasing Power Parity Basis 1990 U.S. dollars, from Kraay, Loayza, Serven, and Ventura (2000) and World Bank, World Development Indicators (2002).

Government Infrastructure (Paved Roads): 1990, Paved roads are those surfaced with crushed stone (macadam) and hydrocarbon binder, with concrete or with cobblestones, as a percentage of country's roads, measured in length; from World Bank, World Development Indicators (2002).

Human Capital: 1970,75,80,85,90,95, Average years of secondary, higher and total schooling in the total population over 25 years old, from World Bank, World Development Indicators (2002).

Incentives: 1990-97, Index on incentives to FDI, constructed by Wei (2000). Wei (2000) converts the textual information in the PwC reports on FDI incentives into numerical codes. For the measurement of incentives, a variable was created based on the presence or absence of restrictions in: 1) existence of special incentives for foreigners to invest in certain industries or certain geographic areas; 2) tax concessions specific to foreign firms (including tax holidays and tax rebates, but excluding concessions for export promotion); 3) non-tax concessions such as tax grants, subsidized loans and reduced rent; 4) special promotion for exports.

Inflation Volatility: 1970-98, Consumer Price Index, annual percentage change, from World Bank, World Development Indicators (2002).

Legal origin: Origin of formal legal code in the country: English common-law, French civil law, Ger-

man civil law, and Scandinavian civil law from La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1997, 1998).

Familiarity with the legal code: Variable taking a value of 1 - if country is origin of legal family or exhibited familiarity with imported law; 0 - otherwise. Berkowitz, Pistor, and Richard (2003).

Mid-year population: 1971-97, from Kraay, Loayza, Serven, and Ventura (2000) and World Bank, World Development Indicators (2002).

Institutional Quality: Composite political safety: 1984-98, Sum of all the rating components from International Country Risk Guide except for Socioeconomic Conditions and Investment Profile. Average yearly rating from 0 to 76, where a higher score means lower risk. Data from International Country Risk Guide, the PRS Group.

Government Stability: 1984-98, The government's ability to carry out its declared program(s), and its ability to stay in office. Average yearly rating from 0 to 12, where a higher score means lower risk. Data from International Country Risk Guide, the PRS Group.

Internal Conflict: 1984-98, Political violence in the country and its actual or potential impact on governance. Average yearly rating from 0 to 12, where a higher score means lower risk. Data from International Country Risk Guide, the PRS Group.

External Conflict: 1984-98, Assessment both of the risk to the incumbent government from foreign action, ranging from non-violent external pressure (diplomatic pressures, withholding of aid, trade restrictions, territorial disputes, sanctions, etc) to violent external pressure (cross-border conflicts to all-out war). Average yearly rating from 0 to 12, where a higher score means lower risk. Data from International Country Risk Guide, the PRS Group.

Non-corruption index: 1984-98, Assessment of corruption within the political system. Average yearly rating from 0 to 6, where a higher score means lower risk. Data from International Country Risk Guide, the PRS Group.

Non-militarized politics: 1984-98, Protection from the military involvement in politics. Average yearly rating from 0 to 6, where a higher score means lower risk. Data from International Country Risk Guide, the PRS Group.

Protection from religious tensions: 1984-98, Protection from the religious tensions in society. Average yearly rating from 0 to 6, where a higher score means lower risk. Data from International Country Risk Guide, the PRS Group.

Law and Order: 1984-98, The Law sub-component is an assessment of the strength and impartiality of the legal system; the Order sub-component is an assessment of popular observance of the law. Average yearly rating from 0 to 6, where a higher score means lower risk. Data from International Country Risk Guide, the PRS Group.

Protection from Ethnic Tensions: 1984-98, Assessment of the degree of tension within a country

attributable to racial, nationality, or language divisions. Average yearly rating from 0 to 12, where a higher score means lower risk. Data from International Country Risk Guide, the PRS Group.

Democratic Accountability: 1984-98, Average yearly rating from 0 to 6, where a higher score means lower risk. In general, the highest number of risk points is assigned to Alternating Democracies, while the lowest number of risk points is assigned to autarchies. Data from International Country Risk Guide, the PRS Group.

Quality of Bureaucracy: 1984-98, Institutional strength and quality of the bureaucracy is another shock absorber that tends to minimize revisions of policy when governments change Average yearly rating from 0 to 4, where a higher score means lower risk. Data from International Country Risk Guide, the PRS Group.

Protection from Government repudiation of contracts: 1982-95, Average yearly rating from 0 to 10, where a higher score means lower risk. Data from IRIS Time-Series of International Country Risk Guide Data.

Protection from Expropriation: 1984-98, Average yearly rating from 0 to 10, where a higher score means lower risk. Data from IRIS Time-Series of International Country Risk Guide Data.

Polity Data:

The dataset focuses on indicators of both regime type and political authority.

Democracy Score: variable taking values from 0 to 10; with 0 denoting low democracy and 10 high democracy. Data for 1900, from Gurr (1974) and Gurr and Jaggers (1996).

Monocratism: independence of the chief executive. Data for averages for 1984-94, 1971-97, from Gurr (1974) and Gurr and Jaggers (1996).

Executive Recruitment Competition: Extent to which executives are chosen through competitive elections; (0) = Unregulated; (1) = Selection; (2) = Dual/Transitional; (3) = Election. Data for 1900, from Gurr (1974) and Gurr and Jaggers (1996).

Executive Recruitment Openness: Opportunity for non-elites to attain executive office; (0) = Unregulated; (1) = Closed; (2) = Dual/Designation; (3) = Dual/Election; (4) = Open. Data for 1900, from Gurr (1974) and Gurr and Jaggers (1996).

Executive Constraints: variable reflecting operational (de facto) independence of chief executive: taking values of (1) = Unlimited authority; (2) = Intermediate category; (3) = Slight to moderate limitations; (4) = Intermediate category; (5) = Substantial limitations; (6) = Intermediate category. Data for 1900, from Gurr (1974) and Gurr and Jaggers (1996).

Regulation of Participation: variable reflecting development of institutional structures for political expression; taking values of (1) = Unregulated; (2) = Factional/Transitional; (3) = Factional/Restricted; (4) = Restricted; (5) = Institutionalized. Data for averages for 1984-94, 1971-97, from Gurr (1974)and Gurr and Jaggers (1996).

Competitiveness of Participation: Extent to which non-elites are able to access institutional structures of political expression; (0) = Unregulated; (1) = Suppressed; (2) = Restricted/Transitional; (3) = Factional; (4) = Transitional; (5) = Competitive. Data for averages for 1984-94, 1971-97, from Gurr (1974) and Gurr and Jaggers (1996).

Restrictions: 1990-97, Index on restrictions to FDI constructed by Wei (2000). Wei (2000) converts the textual information in the PwC reports into numerical codes. For the measurement of restrictions, a variable was created based on the presence or absence of restrictions in: 1) exchange controls; 2) exclusion of foreign firms from certain strategic sectors (in particular, national defense and the mass media); 3) exclusion of foreign firms from other sectors where their presence would be considered harmless in most developed countries; 4) restriction on the share of foreign ownership. The overall restriction index is the sum of these variables.

Reuters: 1987-1997, Number of times a country is mentioned in Reuters, Reuters database following Goldstein (1992) coding, from "Integrated Data for Events Analysis (IDEA) project" by Doug Bond, Joe Bond, Churl Oh (Harvard University), 2001, provided by Doug Bond.

Sovereign Risk: Sovereign risk is an index based on Standard and Poors long term foreign currency denominated sovereign debt ratings, average from 1971 to 1997. Index ranges from 1 (an obligor rated "AAA") to 23 (an obligor rated "SD" (Selective Default)).

Stock market capitalization: 1976-97, Stock market capitalization as share of GDP, from Beck, Demirguc-Kunt and Levine (2000).

Total Factor Productivity (TFP): 1970-97, is approximated from the neoclassical production function as y/k^{α} where y is GDP per capita, k is domestic capital stock per capita as defined above, and $\alpha = 0.3$.

Trade: 1970, Sum of exports and imports as a share of GDP, from World Bank, World Development Indicators (2002).

Historical Data

Sample: Argentina, Australia, Canada, Denmark, France, Germany, India, Indonesia, Japan, Netherlands, Norway, South Africa, Sweden, United Kingdom, United States.

Capital Inflows: From League of Nations, Balance of Payments, 1918-1946 in U.S. Dollars. Data was deflated using US CPI index, 1913=100 , various issues.

GDP Per capita: From Maddison, Monitoring the World Economy 1820-1992.

U.S. CPI Index: From Maddison, Monitoring the World Economy 1820-1992.

Population: From Maddison, Monitoring the World Economy 1820-1992 and Mitchell B.R, International Historical Statistics.

Human Capital: Pupils enrolled in primary and secondary school per population from Mitchell B.R,

International Historical Statistics.

Legal Origin: La Porta, Lopez-de-Silanes, Shleifer, Vishny (1997, 1998).

References

Acemoglu, Daron and Simon Johnson (2003), "Unbundling Institutions," mimeo.

Acemoglu, Daron, Simon Johnson and James A. Robinson (2001), " The Colonial Origins of Comparative Development: An Empirical Investigation," *American Economic Review* 91, 1369–1401.

Acemoglu, Daron, Simon Johnson and James A. Robinson (2002), "Reversal of Fortune: Geography and Institutions in the Making of the Modern World Income Distribution," *The Quarterly Journal of Economics* 117, 1231–1294.

Alfaro Laura, Arendamd Chanda, Sebnem Kalemli-Ozcan and Selin Sayek (2003), "FDI and Economic Growth: The Role of Local Financial Markets," *Journal of International Economics*, forthcoming.

The Bankers Almanac (2001), *BANKbase,* CD-ROM. Windsor Court East Grinstead House, United Kingdom.

Beck, Thorsten, Asli Demirguc-Kunt, and Ross Levine (2000), "A New Database on Financial Development and Structure," *World Bank Economic Review* 14, 597–605.

Berkowitz, Daniel, Katharina Pistor and Jean-Francois Richard (2003), "Economic Development, Legality and the Transplant Effect," *European Economic Review* 47, 165–195.

Bockstette, Valerie, Areendam Chanda and Louis Putterman (2002), "States and Markets: The Advantage of an Early Start," *Journal of Economic Growth* 7, 347–369.

Calvo, Guillermo, Leonardo Leiderman and Carmen Reinhart (1996), "Inflows of Capital to Developing Countries in the 1990s," *The Journal of Economic Perspectives* 10, 123–139.

Coval, Joshua and Tobias J. Moskowitz (1999), "Home Bias at Home: Local Equity Preferences in Domestic Portfolios," *Journal of Finance* 54, 2045–2073.

Coval, Joshua and Tobias J. Moskowitz (2001), "The Geography of Investment: Informed Trading and Asset Prices," *Journal of Political Economy* 109, 811–841.

Clemens, Michael and Jeffrey G. Williamson (2003), "Wealth Bias in the First Global Capital Market Boom, 1870-1913," *Economic Journal*, forthcoming.

Edwards, Sebastian (1991), "Capital Flows, Foreign Direct Investment, and Debt-Equity Swaps in Developing Countries," in *Capital Flows in the World Economy*, Horst Siebert editor. J.C.B. Mohr, Tubingen.

Eichengreen, Barry (2003), *Capital Flows and Crisis.* The MIT Press, Cambridge.

Eichengreen, Barry and P. H. Lindert (1989), "Overview," in *The International Debt Crisis in Historical Perspective*, eds: B. Eichengreen and P.H. Lindert. The MIT Press, Cambridge.

Gertler, Mark and Kenneth Rogoff (1990), "North-South Lending and Endogeneous Domestic Capital Market Inefficiencies," *Journal of Monetary Economics* 26, 245–266.

Gomme, Paul (1993), "Money and Growth Revisited: Measuring the Costs of Inflation in an Endogenous Growth Model," *Journal of Monetary Economics* 32, 51–77.

Gordon, Roger H. and A. Lans Bovenberg (1996), "Why is Capital so Immobile Internationally? Possible Explanations and Implications for Capital Income Taxation?" *American Economic Review* 86, 1057–1075.

Gourinchas, Pierre Olivier and Olivier Jeanne (2003), "The Elusive Gains from International Financial Integration," NBER Working Paper 9684.

Gurr, Ted (1974), "Persistence and Change in Political Systems, 1800-1971," *The American Political Science Review* 68, 1482–1504.

Gurr, Ted and Keith Jaggers (1996), *Polity III: Regime Type and Political Authority 1880-1994.* Inter-university Consortium for Political and Social Research, Ann Arbor, Michigan.

Hall, Robert E. and Charles Jones (1999), "Why Do Some Countries Produce So Much More Output per Worker than Others?" *The Quarterly Journal of Economics* 114, 83–116.

International Monetary Fund (2001), *International Financial Statistics*, CD-ROM. The International Monetary Fund, Washington, DC.

International Monetary Fund, *Annual Report on Exchange Arrangements and Exchange Restrictions*, issues from 1970 to 1997.

Kalemli-Ozcan, Sebnem, Bent Sorensen and Oved Yosha (2003a), "Risk Sharing and Industrial Specialization: Regional and International Evidence," *American Economic Review* 93, 903–918.

Kalemli-Ozcan, Sebnem, Ariell Reshef, Bent Sorensen and Oved Yosha (2003b), "What Determines Capital Income Flows and Ownership Across U.S. States?" mimeo.

King, Robert and Rebelo Sergio (1993), "Transitional Dynamics and Economic Growth in the Neoclassical Model," *American Economic Review* 83, 908–931.

Klein, Michael (2003), "Capital Account Openness and the Varieties of Growth Experience," NBER Working Paper 2003.

Kraay, Aart, Norman Loayza, Luis Serven, and Jaume Ventura (2000), "Country Portfolios," NBER Working Paper 7795.

La Porta, Rafael, Florencio Lopez-de-Silanes, Andrei Shleifer, and Robert Vishny (1997), "Legal Determinants of External Finance," *Journal of Finance* 52, 1131–1150.

La Porta, Rafael, Florencio Lopez-de-Silanes, Andrei Shleifer, and Robert Vishny (1998), "Law and Finance," *Journal of Political Economy* 106, 1113–1155.

Lane, Philip (2000), "Empirical Perspectives on Long-Term External Debt," mimeo.

Lane, Philip and Gian Maria Milesi-Ferretti (2001), "The External Wealth of Nations: Measures of Foreign Assets and Liabilities for Industrial and Developing Countries," *Journal of International Economics* 55, 263–294.

League of Nations, *Balance of Payments: 1918−1946.* League of Nations, Geneva, various issues.

Lucas, Robert (1990), "Why doesn't Capital Flow from Rich to Poor Countries?" *American Economic Review* 80, 92–96.

Maddison, Angus (1995), *Monitoring the World Economy 1820-1992.* Organization for Economic Cooperation and Development, Washington D.C.

Markusen, James R. (1983), "Factor Movements and Commodity Trade as Complements," *Journal of International Economics* 14, 314–356.

Mitchell, B.R. (1998), *International Historical Statistics: fourth edition. 1750-1993.* Macmillan, London.

Mundell, Robert (1957), "International Trade and Factor Mobility," *American Economic Review* 47, 321–335.

North, Douglass C. (1981), *Structure and Change in Economic History.* Norton, New York.

North, Douglass C. (1994), "Economic Performance Through Time," *American Economic Review* 84, 359–368.

North, Douglass C. (1995), "Institutions," *Journal of Economic Perspective* 5, 97–112.

Obstfeld, Maurice (1995), "International Capital Mobility in the 1990s," in *Understanding Interdependence. The Macroeconomics of the Open Economy*, Peter Kenen, editor. Princeton University Press, Princeton.

Obstfeld, Maurice and Kenneth Rogoff (1995), *Foundations of International Macroeconomics.* The MIT Press, Cambridge.

Obstfeld, Maurice and Kenneth Rogoff (2000), "The Six Major Puzzles in International Macroeconomics: Is There a Common Cause?" NBER Working Paper 7777.

Obstfeld, Maurice and Alan Taylor (2002), "Globalization and Capital Markets," NBER Working paper 8846.

O'Rourke, Kevin H. and Jeffrey G. Williamson (1999), *Globalization and History: The Evolution of a Nineteenth-Century Atlantic Economy.* The MIT Press, Cambridge.

Parente L. Stephen and Edward C. Prescott (2000), *Barriers to Riches.* The MIT Press, Cambridge.

The Political Risk Sevices Group (2001), *International Country Risk Guide.* The PRS Group, New York.

Portes, Richard and Helene Rey (2002), "The Determinants of Cross-Border Equity Transaction Flows," mimeo.

Prescott, Edward (1998), "Needed: A Theory of Total Factor Productivity," *International Economic Review* 39, 525–552.

Rajan, Raghuram G. and Luigi Zingales (2003), "The Great Reversals: The Politics of Financial Development in the 20th Century," *Journal of Financial Economics* 69, 5–50.

Razin, Assaf and Chi-Wa Yuen (1994), "Convergence in Growth Rates: a Quantitative Assessment of the Role of Capital Mobility and International Taxation," in *Capital Mobility: The Impact on Consumption, Investment, and Growth*, Leonardo Leiderman and Assaf Razin, eds. Cambridge University Press, New York.

Standards & Poor's, Sovereign Credit Ratings, collected from the site www.standardandpoors.com. Standard & Poor's, New York.

Svensson, Lars E.O. (1984), "Factor Trade and Goods Trade," *Journal of International Economics* 16, 365–378.

Tornell, Aaron and Andres Velasco (1992), "Why Does Capital Flow from Poor to Rich Countries? The Tragedy of the Commons and Economic Growth," *Journal of Political Economy* 100, 1208–1231.

Wei, Shang-Jin (2000), "Local Corruption and Global Capital Flows," *Brookings Papers in Economic Activity* 2, 303–346.

Wei, Shang-Jin and Yi Wu (2002), "Negative Alchemy? Corruption, Composition of Capital Flows, and Currency Crises," *Preventing Currency Crises in Emerging Markets* Sebastian Edwards and Jeffrey A. Frankel, eds. The University of Chicago Press, Chicago.

World Bank (2001), *World Development Indicators,* CD-ROM. The World Bank, Washington, DC.

Table 1: **Descriptive Statistics**

Sample: 46 countries (1971-97)

	Mean	St.Dev.	Min	Max
Net Inflows of Capital per capita ($)	49	63	–42	197
GDP per capita ($ thousands)	6	4	0.8	16
Capital Stock per capita ($ thousands)	13	12	0.7	54
Human Capital (years)	5	3	1	10
Institutional Quality (index)	55	11	34	73
Distantness (thousand kms)	7.8	2.5	5.0	14.5
Inflation Volatility	123	409	2	2180
Trade (%)	43	22	8	97
Capital Controls (index)	0.5	0.3	0.0	1
Removal of Capital Controls	1	0.01	0.98	1.1
Corporate Tax (%)	33	4	28	42
Restrictions (index)	1.6	1	0	4
Incentives (index)	0.9	0.3	0	1
Government Infrastructure (%)	54	32	5	100
Bank Credit (%)	30	20	10	70
Capitalization (%)	10	50	1	60
Reuters (thousand times)	5	13	0.049	86
Sovereign Risk (index)	8	5	1	17
Foreign Banks (%)	20	10	1	60
Accounting (index)	62	11	36	78
Total Factor Productivity (thousands)	0.4	0.2	0.2	0.8

Notes: All variables are sample averages except GDP per capita, Capital Stock per capita, Human Capital and Trade, which are initial values. Net Inflows of Capital per capita is calculated as the difference in stock of foreign claims on domestic capital divided by population (PPP 1990 U.S. Dollars). Hence, it is net inflows of foreign direct investment and portfolio equity investment in per capita. GDP per capita is Gross Domestic Product divided by population in 1971 (PPP 1990 U.S. Thousand Dollars). Capital Stock per capita is domestic capital stock including gold reserves divided by population in 1970 (constant 1990 U.S. Thousand Dollars). Human Capital is measured as the average years of total schooling over 25 years old in the total population, in 1970. Institutional Quality is represented by the composite political safety index calculated as the sum of all the rating components from International Country Risk Guide (ICRG), average from 1984 to 1997. Distantness is the weighted average of the distances in thousands of kms from the capital city of the particular country to the capital cities of the other countries, using the GDP shares of the other countries as weights, average from 1971 to 1997. Inflation Volatility is the standard deviation of the annual CPI inflation, average from 1971 to 1997. Trade is measured as the sum of exports and imports as a share of GDP in 1970, multiplied by 100. It is available for 44 countries. Capital Controls is an index calculated as the mean value of the four dummy variables−exchange arrangements, payments restrictions on current transactions, and capital transactions, repatriation requirements for export proceeds− average from 1971 to 1997. Removal of capital controls is 1-average (1972−1997) yearly change in capital controls. Corporate Taxes represents the corporate income tax rate. Restrictions is an index calculated as the sum of four dummy variables representing restrictive policies on inward investment. Incentives is a dummy variable that shows the existence of special incentives to foreign firms to invest in certain industries or geographical regions. These three variables are available for 32 countries and only for one year, where this year changes from country to country between 1990−1997. Government Infrastructure is the percent of paved roads in total roads. It is average over 1990−1997 and available for 39 countries. Bank credit is the claims on private sector by deposit money banks as a share of GDP, average from 1971 to 1997, multiplied by 100. Capitalization stands for stock market capitalization as a share of GDP, average from 1976 to 1997, multiplied by 100. It is available for 44 countries. Reuters stands for the number of thousand times the country is mentioned in Reuters, average from 1987 to 1997. Sovereign Risk is an index based on Standard and Poor's long term foreign currency denominated sovereign debt ratings, average from 1971 to 1997. Index ranges from 1 (an obligor rated "AAA") to 23 (an obligor rated "SD"−Selective Default). Non-rated debt is considered missing. It is available for 44 countries. Foreign Banks represents the share of banks in total with at least 10% of foreign capital, average from 1990−1997, multiplied by 100. Accounting represents an index created by rating companies' 1990 annual reports in their inclusion of 90 items in balance sheets and income statements. It is available for 31 countries. Total Factor Productivity, average from 1970 to 1997, is approximated from the neoclassical production function as y/k^{α} where y is GDP per capita, k is domestic capital stock per capita as defined above, and $\alpha = 0.3$.

Table 2: **Correlation Matrix**

46 country sample; Main explanatory variables

	GDP	K	HK	Inst	Dist	InfVol
K	0.42					
HK	0.82	0.24				
Inst.	0.85	0.33	0.74			
Dist.	–0.37	0.07	–0.16	–0.39		
Inf. V.	–0.21	–0.01	–0.15	–0.37	0.36	
K Cont.	–0.59	–0.25	–0.58	–0.60	0.16	0.33

Other explanatory variables

	Trade	BCrd	Reut	Fbank	RKcon	Capit	Srisk
Obs.	44	46	46	46	46	44	44
GDP	0.13	0.51	0.40	–0.13	0.28	0.50	–0.65
HK	0.15	0.36	0.49	0.02	0.20	0.44	–0.64
Inst	0.13	0.56	0.42	–0.08	0.34	0.41	–0.76
Dist	–0.19	–0.55	–0.15	–0.01	–0.14	–0.30	0.48
InfV	–0.23	–0.57	–0.25	0.00	–0.32	–0.26	0.47
KCon	–0.11	–0.31	–0.43	0.08	–0.10	–0.11	0.63

	GInf	Ctax	Rest	Inct	Acc	TFP
Obs.	39	32	32	32	31	46
GDP	0.50	0.06	–0.55	–0.22	0.29	0.95
HK	0.41	0.01	–0.51	–0.27	0.57	0.80
Inst	0.53	–0.04	–0.37	–0.48	0.43	0.86
Dist	–0.58	-0.01	0.18	–0.04	–0.06	–0.43
InfV	–0.64	0.09	0.06	0.37	–0.57	–0.32
KCon	–0.41	0.05	0.45	0.27	–0.47	–0.62

Notes: Upper panel shows the correlation matrix for the main regressions with 46 country sample. The values are similar for 57 and 59 country samples. Lower Panel reports the correlation between the main explanatory variables and the other independent variables that are used in robustness regressions. Sample sizes vary for these variables. The abbreviations represent: GDP per Capita (GDP), Capital Stock per Capita (K), Human Capital (HK), Institutional Quality (Inst), Distantness (Dist), Inflation Volatility (InfVol), Capital Controls (KCon), Trade (Trade), Bank Credit (BCrd), Reuters (Reut), Foreign Banks (Fbank), Removal of Capital Controls (RKcon), Capitalization (Capit), Sovereign Risk (Srisk), Paved Roads (GInf), Corporate Tax (Ctax), Restrictions (Rest), Incentives (Inct), Accounting (Acc), and Total Factor Productivity (TFP). See notes to Table 1 for the detailed explanations of these variables.

Table 3: **Explaining the Lucas Paradox I**

Dependent Variable: Net Inflows of Capital per capita

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Countries	47	47	46	47	46	46	46	46
GDP per capita	4.99***	2.94**	0.10	4.99***	–1.10	–0.99	–1.15	–1.06
	(5.75)	(2.40)	(0.08)	(5.03)	(0.83)	(0.67)	(0.89)	(0.73)
Human Capital	–	3.60*	–	–	2.88**	2.90**	2.75**	2.79**
	–	(1.97)	–	–	(2.15)	(2.19)	(2.15)	(2.20)
Institutional Quality	–	–	4.10***	–	3.46***	3.34***	3.37***	3.29***
	–	–	(4.39)	–	(4.46)	(3.79)	(4.05)	(3.68)
Distantness	–	–	–	–1.51	–1.23	–1.03	–1.29	–1.14
	–	–	–	(0.53)	(0.50)	(0.41)	(0.51)	(0.43)
Inflation Volatility	–	–	–	–	–	–0.14	–	–0.10
	–	–	–	–	–	(0.49)	–	(0.37)
Capital Controls	–	–	–	–	–	–	–1.32	–1.13
	–	–	–	–	–	–	(0.45)	(0.37)
R^2	0.43	0.46	0.58	0.46	0.62	0.63	0.63	0.63

Notes: All regressions include a constant and are estimated by OLS with White's correction of heteroskedasticity. t-statistics are in parentheses denoting *** 1%, ** 5%, and * 10% significance. All variables are in logs except for Institutional Quality and Capital Controls. All variables are sample averages except GDP per capita and Human Capital, which are initial values. See notes to Table 1 for the description of the variables.

Table 4: **Explaining the Lucas Paradox II**

Dependent Variable: Net Inflows of Capital per capita

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Countries	47	47	46	47	46	46	46	46
Capital stock per capita	3.77*** (7.27)	2.73*** (4.03)	0.76 (0.98)	3.66*** (6.10)	0.09 (0.10)	0.27 (0.29)	0.04 (0.05)	0.22 (0.21)
Human Capital	– –	2.73* (1.82)	– –	– –	2.13* (1.61)	2.14* (1.65)	2.02* (1.65)	2.06* (1.71)
Institutional Quality	– –	– –	3.30*** (4.48)	– –	3.06*** (4.47)	2.82*** (3.39)	2.99*** (4.24)	2.81*** (3.41)
Distantness	– –	– –	– –	–1.13 (–0.43)	–0.86 (–0.36)	–0.56 (1.23)	–0.92 (–0.37)	–0.64 (–0.24)
Inflation Volatility	– –	– –	– –	– –	– –	–0.21 (0.73)	– –	–0.18 (0.60)
Capital Controls	– –	– –	– –	– –	– –	– –	–1.16 (–0.38)	–0.79 (–0.25)
R^2	0.51	0.53	0.61	0.51	0.62	0.62	0.62	0.62

Notes: All regressions include a constant and are estimated by OLS with White's correction of heteroskedasticity. t-statistics are in parentheses denoting *** 1%, ** 5%, and * 10% significance. All variables are in logs except for Institutional Quality and Capital Controls. All variables are sample averages except Capital Stock per capita and Human Capital, which are initial values. See notes to Table 1 for the description of the variables.

Table 5: **Explaining the Lucas Paradox III: Analysis by Decades**

Dependent Variable: Net Inflows of Capital per capita

	(1)	(2)	(3)	(4)	(5)
Countries	46	46	46	46	46
Time period	(1971−1980)	(1980−1990)	(1985−1995)	(1990−1997)	(1971−1995)
GDP per capita	0.23 (0.17)	–1.94 (0.69)	–1.94 (0.63)	–2.06 (0.52)	–0.68 (0.42)
Human Capital	2.56 (1.13)	1.54 (0.71)	3.29 (1.56)	4.85 (1.15)	2.06 (1.45)
Institutional Quality	1.01** (2.01)	2.65** (2.09)	6.29*** (3.49)	7.68*** (2.56)	2.94*** (3.52)
Distantness	–1.87 (0.60)	–0.38 (0.07)	–1.86 (0.28)	–1.31 (0.53)	–1.55 (0.42)
Inflation Volatility	–0.29 (0.49)	–0.17 (0.40)	–0.15 (0.39)	–0.82 (1.10)	–0.25 (0.85)
Capital Controls	1.31 (0.70)	–2.81 (0.69)	–10.21** (2.14)	–6.57 (1.23)	–1.71 (0.62)
R^2	0.30	0.35	0.62	0.43	0.57

Notes: All regressions include a constant and are estimated by OLS with White's correction of heteroskedasticity. t-statistics are in parentheses denoting ***1%, **5%, *10% significance levels. All variables are in logs except for Institutional Quality and Capital Controls. All variables are sample averages for the corresponding sub-period except GDP per Capita and Human Capital, which are initial values for the corresponding sub-periods. In columns (1) and (2) institutional quality is captured by the law and order index instead of the composite index. The other columns use the composite index. See notes to Table 1 for the description of the variables.

Table 6: **Robustness I: Institutions I**

Dependent Variable: Net Inflows of Capital per capita

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Observations	46	46	46	46	46	46	46	46
GDP per capita	1.03 (0.78)	0.28 (0.18)	–0.11 (0.11)	–0.40 (0.28)	0.52 (0.45)	1.45 (1.06)	0.85 (0.62)	1.23 (0.97)
Human Capital	3.17** (2.35)	4.15*** (2.76)	0.60 (0.58)	2.60* (1.96)	1.25 (0.72)	2.03* (1.68)	1.98 (1.57)	1.58 (1.22)
Institutional Quality	3.24*** (3.76)	0.88*** (3.08)	3.13*** (3.39)	2.83*** (4.13)	2.89*** (3.72)	1.62** (2.21)	1.75*** (3.00)	1.87*** (3.64)
Distantness	–0.02 (0.01)	–1.94 (0.69)	–0.30 (0.10)	–0.23 (0.09)	–0.70 (0.25)	–1.29 (0.43)	–0.73 (0.25)	–0.35 (0.12)
Inflation Volatility	–0.06 (0.21)	–0.30 (1.06)	–0.04 (0.12)	–0.03 (0.10)	–0.17 (0.59)	–0.13 (0.39)	–0.09 (0.27)	–0.10 (0.33)
Capital Controls	–1.57 (0.43)	–0.59 (0.18)	–3.81 (1.09)	–1.40 (0.43)	–2.07 (0.65)	–4.01 (1.10)	–0.81 (0.24)	–0.70 (0.22)
R^2	0.63	0.59	0.65	0.64	0.61	0.56	0.59	0.60

Notes: All regressions include a constant and are estimated by OLS with White's correction of heteroskedasticity. t-statistics are in parentheses denoting *** 1%, ** 5%, and * 10% significance levels. All variables are in logs except for Institutional Quality and Capital Controls. All variables are sample averages except GDP per Capita and Human Capital, which are initial values. Institutional Quality is captured by the following ICRG variables: (1) Government Stability—the government's ability to carry out its declared program(s), and its ability to stay in office, ranges from 0 to 12, (1984−1997); (2) Internal Conflict—protection from political violence in the country and its actual or potential impact on governance, ranges from 0 to 12, (1984−1997); (3) Non-corruption index—assessment of corruption within the political system, ranges from 0 to 6, (1984−1997); (4) Law and Order: the Law sub-component is an assessment of the strength and impartiality of the legal system; the Order sub-component is an assessment of popular observance of the law, ranges from 0 to 6, (1984−1997); (5) Democratic Accountability—ranges from 0 to 6, where a higher score represents stable democracies and lower scores represent autocratic regimes (1984−1997); (6) Bureaucratic Quality ranges from 0 to 4 and represents institutional strength and quality of the bureaucracy (1984−1997); (7) Protection from government repudiation of contracts ranges from 0 to 10, where a higher score represents higher protection (1982−1995); (8) Protection from Expropriation ranges from 0 to 10, where a higher score represents higher protection (1982−1995). See notes to Table 1 for the description of the other variables.

Table 7: **Robustness II: Other Measures of Fundamentals**

Dependent Variable: Net Inflows of Capital per capita

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Observations	46	44	32	32	32	39	46	44	46
GDP per capita	–1.23 (0.85)	–1.56 (1.10)	–1.40 (0.73)	–2.80* (1.78)	–2.29 (1.39)	–2.02 (1.13)	–0.58 (0.36)	–1.24 (0.71))	–1.87 (0.65)
Human Capital	2.89** (2.47)	3.03*** (2.72)	4.19** (2.18)	3.91** (2.38)	4.45*** (2.69)	2.91* (1.95)	2.77** (2.00)	3.18** (2.50)	2.45* (1.90)
Institutional Quality	3.11*** (3.32)	2.87*** (3.59)	4.46*** (3.76)	4.86*** (3.99)	4.94*** (3.89)	3.52*** (3.50)	3.46*** (3.68)	3.33** (3.54)	3.30*** (3.37)
Distantness	–1.39 (0.54)	–4.48* (1.59)	–0.37 (0.14)	–0.66 (0.27)	–0.29 (0.13)	0.47 (0.15)	–2.36 (1.04)	–1.89 (0.62))	0.03 (0.01)
Inflation Volatility	–0.03 (0.10)	0.04 (0.16)	–0.06 (0.12)	0.09 (0.22)	–0.10 (0.20)	0.14 (0.35)	–0.30 (0.79)	–0.07 (0.21)	–0.09 (0.28)
Capital Controls	–1.85 (0.67)	–3.71 (1.35)	3.34 (1.09)	– –	3.03 (0.79)	–1.47 (0.44)	0.25 (0.09)	–0.95 (0.28)	–0.75 (0.26)
Removal of Cap. Controls	0.59 (1.31)	– –	– –	– –	– –	– –	– –	– –	– –
Trade	– –	0.49 (0.60)	– –	– –	– –	– –	– –	– –	– –
Corporate Taxes	– –	– –	–0.45** (2.67)	– –	– –	– –	– –	– –	– –
Restrictions	– –	– –	– –	–0.44 (0.58)	– –	– –	– –	– –	– –
Incentives	– –	– –	– –	– –	0.39 (0.18)	– –	– –	– –	– –
Government Infrastructure	– –	– –	– –	– –	– –	1.32 (1.01)	– –	– –	– –
Bank Credit	– –	– –	– –	– –	– –	– –	–2.15* (1.72)	– –	– –
Capitalization	– –	– –	– –	– –	– –	– –	– –	–0.16 (0.40)	– –
TFP	– –	– –	– –	– –	– –	– –	– –	– –	2.24 (0.29)
R^2	0.64	0.69	0.72	0.63	0.64	0.62	0.65	0.63	0.63

Notes: All regressions include a constant and are estimated by OLS with White's correction of heteroskedasticity. t-statistics are in parentheses denoting *** 1%, ** 5%, and * 10% significance levels. All variables are in logs except for Institutional Quality, Capital Controls, Removal of Capital Controls, Corporate Taxes, Restrictions and Incentives. All variables are sample averages except GDP per Capita, Human Capital, and Trade which are initial values. See notes to Table 1 for the description of the variables.

Table 8: **Robustness II: Other Measures of Market Imperfections**

Dependent Variable: Net Inflows of Capital per capita

	(1)	(2)	(3)	(4)	(5)
Observations	46	46	46	31	44
GDP per capita	–0.64 (0.47)	–1.02 (0.79)	–0.57 (0.40)	–0.53 (0.29)	–1.75* (1.75)
Human Capital	2.15 (1.60)	2.25* (1.82)	2.24* (1.85)	2.75 (1.40)	1.20 (0.95)
Institutional Quality	3.54*** (4.00)	3.68*** (4.00)	3.33*** (3.63)	4.47*** (3.48)	2.54*** (2.71)
Inflation Volatility	0.07 (0.22)	–0.12 (0.48)	–0.15 (0.60)	0.31 (0.55)	0.43 (1.67)
Capital Controls	–1.22 (0.42)	–0.71 (0.24)	–1.08 (0.37)	5.07 (1.14)	3.22 (1.06)
Distantness	–2.91 (0.96)	– –	– –	– –	– –
Reuters	– –	0.22 (0.50)	– –	– –	– –
Foreign Banks	– –	– –	0.59 (0.78)	– –	– –
Accounting	– –	– –	– –	5.91 (1.33)	– –
Sovereign Risk	– –	– –	– –	– –	–3.91*** (3.51)
R^2	0.61	0.60	0.63	0.66	0.66

Notes: All regressions include a constant and are estimated by OLS with White's correction of heteroskedasticity. t-statistics are in parentheses denoting *** 1%, ** 5%, and * 10% significance levels. All variables are in logs except for Institutional Quality, and Capital Controls. All variables are sample averages except GDP per Capita, Human Capital, and Trade, which are initial values. In column (1) Distantness is population weighted instead of GDP. See notes to Table 1 for the description of the variables.

Table 9: **Robustness III: Calculation of Inflows of Capital**

Dependent Variable: Net Inflows of Capital per capita

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Countries	57	57	57	57	57	57	57
GDP per capita	2.19*** (3.21)	1.58** (2.20)	0.98* (1.95)	1.66*** (3.06)	0.16 (0.40)	0.01 (0.03)	–0.13 (0.19)
Human Capital	– –	2.00* (1.64)	– –	– –	2.25* (1.76)	2.05 (1.47)	3.85* (1.86)
Institutional Quality	– –	– –	1.91*** (3.73)	– –	1.26** (2.48)	1.17** (2.14)	3.06*** (2.98)
Distantness	– –	– –	– –	–5.44** (2.40)	–5.53** (2.28)	–5.20** (2.32)	–14.91*** (4.57)
Inflation Volatility	– –	– –	– –	– –	– –	–0.14 (0.76)	0.08 (0.23)
Capital Controls	– –	– –	– –	– –	– –	–2.09 (–0.92)	–3.56 (–0.84)
R^2	0.26	0.27	0.31	0.31	0.35	0.36	0.51

Notes: All regressions include a constant and are estimated by OLS with White's correction of heteroskedasticity. t-statistics are in parentheses denoting *** 1%, ** 5%, and * 10% significance levels. All variables are in logs except for Institutional Quality and Capital Controls. All variables are sample averages except GDP per Capita and Human Capital, which are initial values. This table uses a different data source for net inflows of capital. These inflows are calculated as the differences in stocks of direct investment liabilities and portfolio equity in constant 1995 U.S. Dollars. (Descriptive statistics: Mean: 294.27; Std.Dev.: 635.21; Min.: 0.78; Max.: 3514.78). In column (7) the capital inflows is calculated as the differences in stocks of direct investment liabilities, portfolio equity, portfolio debt liabilities, and other investment liabilities in constant 1995 U.S. Dollars (Descriptive statistics: Mean: 640.72; Std.Dev.: 1222.50; Min.: 0.78; Max.: 7001.03). The estimates of stocks come from Lane and Milesi-Ferretti (2001). See notes to Table 1 for the description of the other variables.

Table 10: **Robustness III: Calculation of Inflows of Capital**

Dependent Variable: Capital Inflows per capita

	(1)	(2)	(3)	(4)	(5)
Countries	59	59	59	59	59
GDP per capita	0.93*** (4.21)	0.47*** (2.57)	0.38* (1.91)	0.76*** (3.90)	–0.10 (0.60)
Human Capital	– –	1.50** (2.56)	– –	– –	1.49** (2.03)
Institutional Quality	– –	– –	0.87*** (4.65)	– –	0.46* (1.93)
Distantness	– –	– –	– –	–1.74 (1.34)	–1.68 (1.33)
Inflation Volatility	– –	– –	– –	– –	–0.13 (1.28)
Capital Controls	– –	– –	– –	– –	–0.69 (1.04)
R^2	0.27	0.31	0.32	0.29	0.39

Notes: All regressions include a constant and are estimated by OLS with White's correction of heteroskedasticity. t-statistics are in parentheses denoting *** 1%, ** 5%, and * 10% significance levels. All variables are in logs except for Institutional Quality and Capital Controls. All variables are sample averages except GDP per Capita and Human Capital, which are initial values. This table uses a different data source. The capital inflows is calculated as the inflows of direct investment liabilities and portfolio equity liabilities in constant 1995 U.S. Dollars (Descriptive statistics: Mean: 158.33; Std.Dev.: 263.15; Min.: 0.17; Max.: 1673.21). The capital inflows data are from IMF, IFS. See notes to Table 1 for the description of the variables.

Table 11: **Explaining the Lucas Paradox: IV Analysis (First Stage Regressions)**

Dependent Variable: Index of Institutional Quality

	(1)	(2)	(3)	(4)	(5)
Countries	46	46	46	26	26
French Legal Origin	0.04 (0.15)	0.08 (0.28)	0.25 (0.86)	– –	– –
German Legal Origin	0.78* (1.75)	0.53 (1.42)	0.87** (2.13)	– –	– –
Mortality	– –	– –	– –	–0.38** (2.48)	–0.33** (1.99)
Familiarity with Legal Code	2.04*** (9.68)	1.82*** (8.09)	1.89*** (8.64)	– –	– –
Democracy	– –	– –	– –	0.54*** (6.86)	0.45*** (5.07)
Executive Recruitment Comp.	– –	–0.34** (2.12)	– –	–1.94*** (4.81)	–1.64** (3.88)
Executive Recruitment Open.	– –	0.09 (0.67)	– –	1.06*** (5.13)	1.04*** (5.35)
Executive Constraints	– –	0.20*** (3.40)	0.12** (2.24)	– –	– –
English Language	– –	– –	0.06 (0.20)	– –	0.65* (1.72)
R^2	0.65	0.72	0.69	0.70	0.72

Notes: All regressions include a constant and are estimated by White's correction of heteroskedasticity. In columns (4) and (5) the sample is different from the main specification to be compatible with the data on Mortality. It includes former colonies: Argentina, Australia, Bolivia, Brazil, Canada, Colombia, Costa Rica, Dominican Republic, Ecuador, Guatemala, Honduras, Indonesia, India, Jamaica, Sri Lanka, Mexico, Malaysia, New Zealand, Pakistan, Peru, El Salvador, Trinidad and Tobago, Tunisia, United States, Venezuela, and South Africa. French, German, English and Scandinavian Legal Origin correspond to the Legal family. Familiarity with legal code corresponds to whether the country is the origin of the legal family or exhibited familiarity with the imported law. Mortality represents log of the historical European settlers mortality from Acemoglu, Johnson, and Robinson (2001). Democracy corresponds to regime type. Executive Constraints, Executive Recruitment Competition, Executive Recruitment Openness scores correspond to restrictions to the executive power and participation rules in the country. These are 1900 values from Polity data set. English language is the fraction of the population speaking English as the mother tongue.

Table 12: **Explaining the Lucas Paradox: IV Analysis (Second Stage Regressions)**

Dependent Variable: Net Inflows of Capital per capita

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	IV	IV	IV	IV	IV	OLS	OLS
Countries	46	46	46	26	26	46	26
GDP per capita	–3.31 (1.05)	–3.66 (1.55)	–4.19 (1.55)	0.08 (0.05)	–0.01 (0.01)	–1.06 (0.73)	–0.78 (0.51)
Human Capital	2.06 (1.02)	1.95 (1.03)	1.78 (0.84)	0.78 (0.43)	0.75 (0.43)	2.79** (2.20)	0.49 (0.30)
Institutional Quality	5.63* (1.78)	6.00*** (2.66)	6.54*** (2.44)	1.63 (1.46)	1.72* (1.88)	3.29*** (3.68)	2.56*** (2.64)
Distantness	–0.60 (0.22)	–0.52 (0.20)	–0.39 (0.15)	7.92** (2.07)	7.91** (2.07)	–1.14 (0.43)	7.80** (2.13)
Inflation Volatility	0.21 (0.45)	0.26 (0.62)	0.33 (0.72)	–0.40 (1.56)	–0.39 (1.50)	–0.10 (0.37)	–0.32 (1.27)
Capital Controls	–0.19 (0.06)	–0.04 (0.01)	0.1 (0.06)	–3.00 (1.26)	–2.98 (1.26)	–1.13 (0.37)	–2.84 (1.18)
R^2	0.61	0.61	0.62	0.63	0.63	0.63	0.63

Notes: All regressions include a constant and are estimated by with White's correction of heteroskedasticity. t-statistics are in parentheses denoting *** 1%, ** 5%, and * 10%. Institutional Quality is instrumented by (1) we use French and German Legal Origin and Familiarity with Legal Code variables; in (2) we use Executive Recruitment Competition, and Executive Recruitment Openness and Executive Constraints scores in addition to French and German Legal Origin and Familiarity with Legal Code; in (3) we use French and German Legal Origin, Familiarity with Legal Code, Executive Constraints and English Language; in (4) Mortality, Democracy, Executive Recruitment Competition, and Executive Recruitment Openness scores; in (5) Mortality, Democracy, Executive Recruitment Competition, Executive Recruitment Openness scores, and English Language. Last two columns give the corresponding OLS regressions. See notes to Table 1 for the description of the variables.

Table 13: **Explaining the Lucas Paradox: Historical Evidence**

Dependent Variable: Capital Inflows per capita

	1918−1946			
	(1)	(2)	(3)	(4)
Countries	15	15	15	15
GDP per Capita	0.013†	–0.012	0.012	0.012
	(1.54)	(0.55)	(1.32)	(1.29)
Human Capital	–	0.026	–	–
	–	(1.31)	–	–
Distantness	–	–	–0.005	–
	–	–	(0.81)	–
Institutional Quality	–	–	–	–0.010**
	–	–	–	(2.56)
R^2	0.10	0.21	0.13	0.29

Notes: Capital inflows per capita are long-term and short-term capital inflows per capita in U.S. dollars deflated using consumer price index and averaged over 1918-1946 (Mean:12.1, Std.dev:12.2, Min: 1.5, Max: 39). GDP per capita is 1918 value and it is in thousands of 1990 Geary-Khamis dollars as calculated by Maddison (1995) (Mean:3, Std.dev: 15, Min: 0.6, Max: 6). Human Capital is 1918 number of pupils in primary school in the total population multiplied by 100 (Mean:12, Std.dev: 5, Min: 2, Max: 20). Distantness is the weighted average of the distances in thousands of square kilometers from the capital city of the particular country to the capital cities of the other countries, using the GDP shares of the other countries as weights, averaged from 1918 to 1946 (Mean: 19, Std.dev: 8, Min: 12, Max: 39). Institutional Quality corresponds to French Legal Origin (Mean: 0.3, Std.dev: 0.5, Min: 0, Max:1). All regressions include a constant and are estimated by OLS with White's correction of heteroskedasticity. t-statistics are in parentheses denoting *** 1%, ** 5%, * 10% and †15% significance levels. All variables are in logs except institutional quality. Corr(GDP per capita, Human capital)=0.85; Corr(GDP per capita, Distantness)=–0.19; Corr(GDP per capita, Institutional Quality)=–0.08. Corr(Human capital, Distantess)=–0.31; Corr(Human capital, Institutional Quality)=–0.29. Corr(Distantness, Institutional Quality)=–0.05.

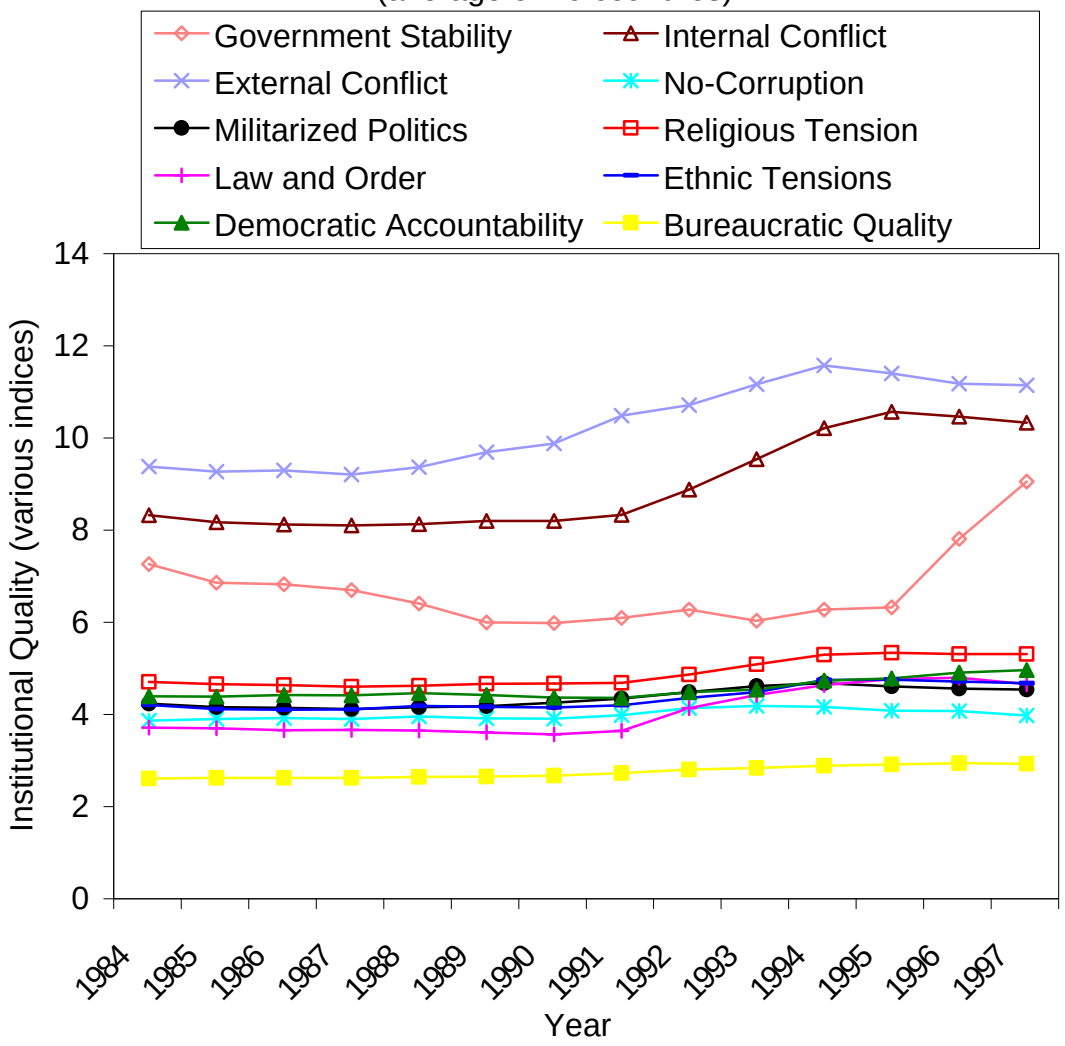
Table 14: **Additional Robustness for Institutions**

Dependent Variable: Net Inflows of Capital per capita

	(1)	(2)	(3)	(4)	(5)	(6)
Observations	46	46	46	46	46	46
GDP per capita	1.21	1.27	2.06	1.30	1.31	1.97
	(0.72)	(0.92)	(1.51)	(0.73)	(0.92)	(1.48)
Human Capital	3.53**	3.67***	3.24**	3.57**	3.71***	3.18**
	(2.32)	(2.69)	(2.07)	(2.27)	(2.68)	(2.06)
Institutional Quality	1.07	1.11*	1.36*	1.00	1.14	1.35*
	(1.17)	(1.75)	(1.78)	(1.10)	(1.43)	(1.70)
Distantness	–1.22	–1.17	–1.48	–1.41	–1.37	–1.61
	(0.41)	(0.41)	(0.50)	(0.47)	(0.47)	(0.54)
Inflation Volatility	–0.51*	–0.38	–0.37	–0.41	–0.44	–0.43
	(1.88)	(1.29)	(1.37)	(1.13)	(1.52)	(1.51)
Capital Controls	–3.17	–2.21	–1.74	–2.78	–1.93	–1.70
	(0.95)	(0.65)	(0.53)	(0.84)	(0.55)	(0.86)
R^2	0.55	0.56	0.56	0.54	0.56	0.56

Notes: All regressions include a constant and are estimated by OLS with White's correction of heteroskedasticity. t-statistics are in parentheses denoting *** 1%, ** 5%, and * 10% significance levels. All variables are in logs except for Institutional Quality and Capital Controls. All variables are sample averages except GDP per Capita and Human Capital, which are initial values. Institutional Quality is captured by the following Polity Data variables: (1) Competitiveness of Participation—the extent to which non-elites are able to access the institutional structure of the political expression, 1984−1994; (2) Regulation of Participation—development of the institutional structure for the political expression, 1984−1994; (3) Monocratism—institutional independence of the chief executive, 1984−1994. (4) Competitiveness of Participation, 1971−1997; (5) Regulation of Participation, 1971−1997; (6) Monocratism, 1971−1997. See notes to Table 1 for the description of the other variables.

Figure 1: Evolution of Institutional Quality
(average of 46 countries)



Notes: Data is from ICRG. Governement Stability is defined as the governement's ability to carry out its declared programs and its ability to stay in office. It ranges from 0 to 12. Internal conflict is defined as the political violence in the country and its actual or potential impact on governance. It ranges from 0 to 12. External conflict is the risk to the incumbent government from foreign action, ranging from non-violent external pressure to violent external pressure. It ranges from 0 to 12. No-corruption is an index of the degree of the non-corruption within the political system. It ranges from 0 to 6. Militarized politics is the degree of protection from the military involvement in politics. It ranges from 0 to 6. Religious tensions is the degree of the protection from religious tensions in the society. It ranges from 0 to 6. The law component of the law and order index is an assesment of the strength and impartiality of the legal system; the order component is the assesment of the popular observence of the law. It ranges from 0 to 6. Ethnic tensions is the degree of protection from the tensions attributable to ratial, nationality or language divisions in the society. It ranges from 0 to 12. Democratic Accountability ranges from 0 to 6, where a higher score represents stable democracies and lower scores represents autocracies. Bureaucratic Quality ranges from 0 to 4 and represents institutional strength and quality of the bureacracy.

Figure 2a: Evolution of Government Stability

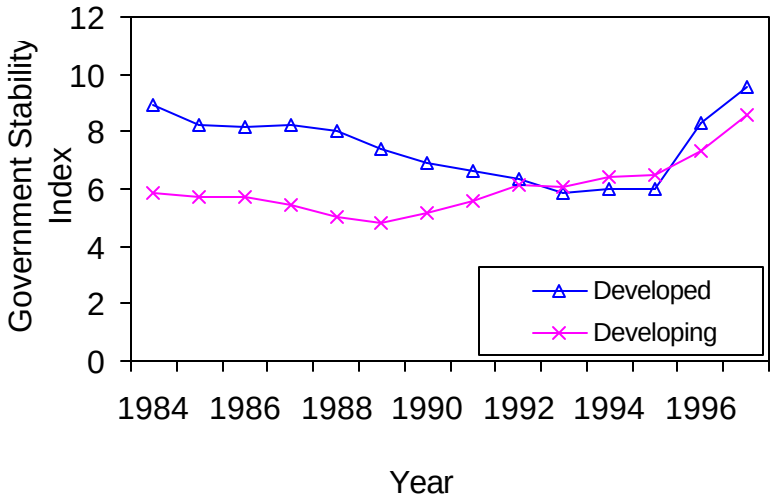


Figure 2b: Evolution of Internal Conflict

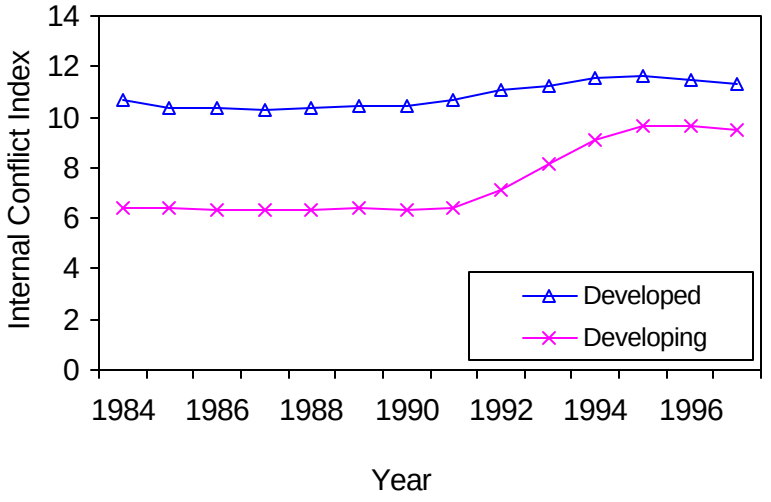


Figure 2c: Evolution of No-Corruption

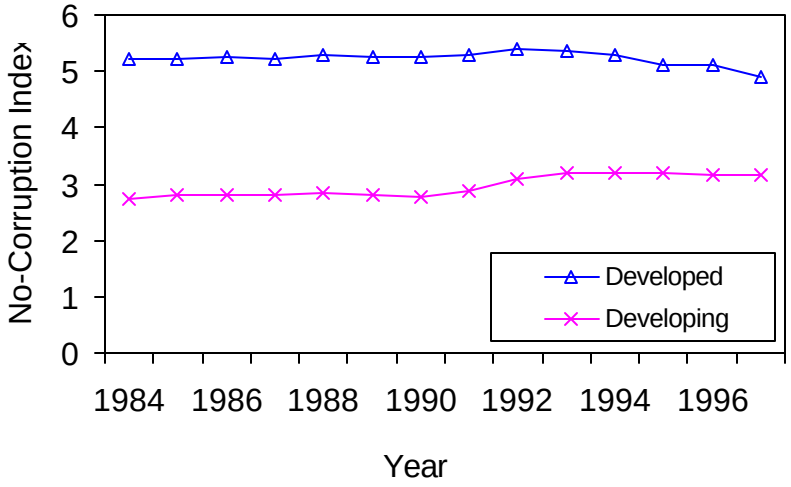
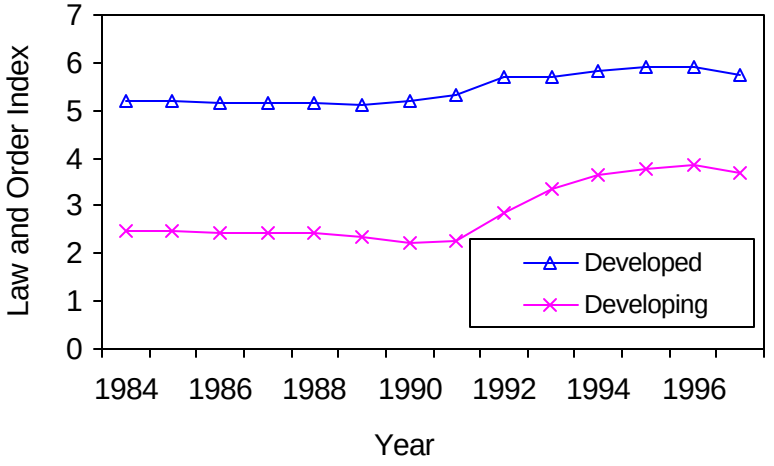
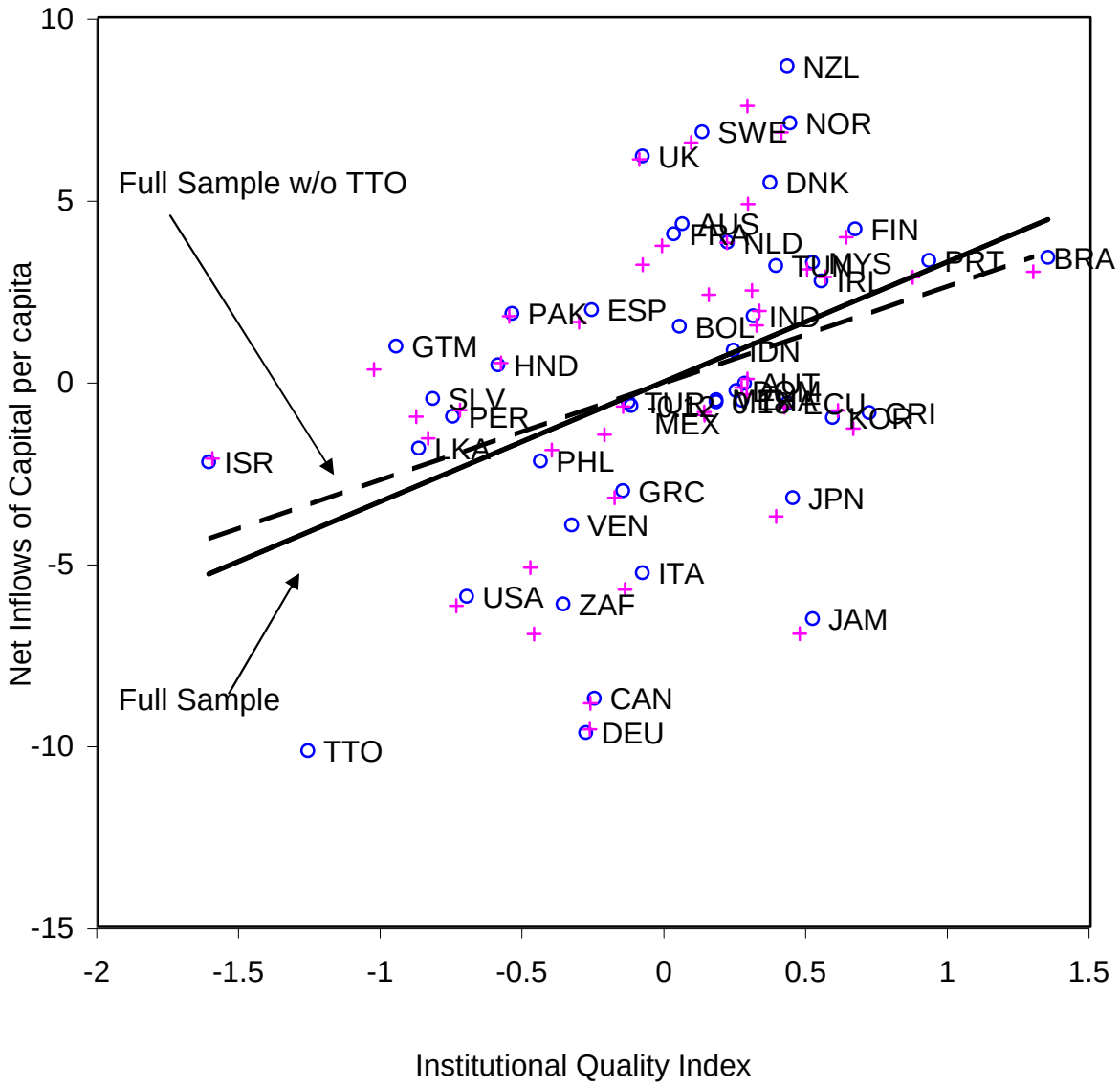


Figure 2d: Evolution of Law and Order



Notes: See Notes to Figure 1. Developed countries are composed of 20 OECD countries. Developing countries are composed of 15 Latin American, 11 Asian and 2 African countries.

Figure 3: Regression of Net Inflows of Capital per capita on Institutional Quality after controlling for other regressors



Notes: We first regressed the net inflows of capital per capita on the regressors other than institutional quality and took the residuals, which we then regressed on the residuals from a regression of institutional quality on the other regressors (including a constant in both regressions). The coefficent on institutional quality is then exactly the same as the coefficient in the multiple regression. We plot the first set of residuals against the second set in the figure.