

FEASIBLE GLOBALIZATIONS

Dani Rodrik¹
Harvard University
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Introduction

We want economic integration to help boost living standards. We want democratic politics so that public policy decisions are made by those that are directly affected by them (or their representatives). And we want self-determination, which comes with the nation-state. This paper argues that we cannot have all three things simultaneously. The political trilemma of the global economy is that the nation-state system, democratic politics, and full economic integration are mutually incompatible. We can have at most two out of the three. It follows that the direction in which we seem to be headed—global markets without global governance—is unsustainable.

The alternative is a renewed “Bretton-Woods compromise:” preserving some limits on integration, as built into the original Bretton Woods arrangements, along with some more global rules to handle the integration that can be achieved. Those who would make a different choice—toward tighter economic integration—must face up to the corollary: either tighter world government or less democracy.

During the first four decades following the close of the Second World War, international policy makers had kept their ambitions in check. They pursued a limited form of internationalization of their economies, leaving lots of room for national economic management. Successive rounds of multilateral trade negotiations made great strides, but focused only on the most egregious of the barriers at the border and excluded large chunks of the economy

¹ I am grateful to Michael Weinstein for very helpful suggestions.

(agriculture, services, “sensitive” manufactures such as garments). In capital markets, restrictions on currency transactions and financial flows remained the norm rather than the exception. This Bretton Woods/GATT regime was successful because its architects subjugated international economic integration to the needs and demands of national economic management and of democratic politics.

This strategy changed drastically during the last two decades. Global policy is now driven by an aggressive agenda of “deep” integration—elimination of all barriers to trade and capital flows wherever those barriers may be found. The results have been problematic--in terms of both economic performance (relative to the earlier post-war decades) and political legitimacy. The simple reason is that “deep” economic integration is unattainable in a context where nation states and democratic politics still exert considerable force.

The title of this essay conveys therefore two ideas. First, there are inherent limitations to how far we can push global economic integration. It is neither feasible nor desirable to maximize what Keynes called “economic entanglements between nations.”² Second, within the array of feasible globalizations, there are many different models to choose from. Each of these models has different implications for whom we empower and whom we don’t, and who gains and who loses. We need to recognize these two facts in order to make progress in the globalization debate. One implication is that we need to scale down our ambitions with respect to global economic integration. Another is that we need to do a better job of writing the rules for a thinner version of globalization.

² Keynes used this phrase in an essay written in the midst of the Great Depression, in which he appeared to have given up on free trade altogether: “I sympathize with those who would minimize, rather than those who would maximize economic entanglements between nations. Ideas, art, knowledge, hospitality and travel should be international. But let goods be homespun whenever it is reasonable and conveniently possible, and above all let finance be primarily national.” (John Maynard Keynes, “National Self-Sufficiency”, *Yale Review*, 1933.)

My argument about the limits to globalization is not (or should not be) self-evident. It rests on several building blocks, and it may be useful to state these at the outset. The argument proceeds from the starting point that markets need to be embedded in a range of non-market institutions in order to work well. These institutions perform several functions critical to markets' performance: they create, regulate, stabilize, and legitimate markets.

The second and much less appreciated point is that there is no simple or unique mapping between these functions and the form that the institutional infrastructure can take. American-style capitalism differs greatly from Japanese-style capitalism; there is tremendous variety in labor-market and welfare-state institutions even within Europe; and low-income countries often require heterodox institutional arrangements to embark on development.

The third point is that institutional diversity of this kind is a significant impediment to full economic integration. Indeed, now that formal restrictions on trade and investment have mostly disappeared, regulatory and jurisdictional discontinuities created by heterogeneous national institutions constitute the most important barriers to international commerce. "Deep integration" would require removing these transaction costs through institutional harmonization—an agenda on which the World Trade Organization has already embarked. However, once we recognize that institutional diversity performs a valuable economic (as well as social) role, it becomes clear that this is a path full of dangers.

Fortunately, there are "feasible" models of globalization that would generate significantly more benefits than our current version—and a much more equitable distribution thereof. I discuss towards the end of the paper a modification of global rules that would produce particularly powerful results: a multilaterally negotiated visa scheme that allows expanded (but temporary) entry into the advanced nations of a mix of skilled and unskilled workers from

developing nations. Such a scheme would create income gains that are larger than all of the items on the WTO negotiating agenda taken together, even if it resulted in a relatively small increase in cross-border labor flows.

Markets and non-market institutions

The paradox of markets is that they thrive not under *laissez-faire* but under the watchful eye of the state. Here is how Jacques Barzun describes the extensive regulatory apparatus in place in Venice at the height of its wealth and power around 1650:

There were inspectors of weights and measures and of the Mint; arbitrators of commercial disputes and of servants and apprentices' grievances; censors of shop signs and taverns and of poor workmanship; wage setters and tax leviers; consuls to help creditors collect their due; and a congeries of marine officials. The population, being host to sailors from all over the Mediterranean, required a vigilant board of health, as did the houses of resort, for the excellence of which Venice became noted. All the bureaucrats were trained as carefully as the senators and councilors and every act was checked and rechecked as by a firm of accountants.³

What made Venice the epicenter of international trade and finance in 17th century Europe was the quality of its public institutions. The same can be said of London in the 19th century and New York in the second half of the 20th.

It is generally well understood that markets require non-market institutions—at the very least, a legal regime that enforces property rights and contracts. Without property rights and contract enforcement, markets cannot exist in any but the most rudimentary fashion. But the dependence of markets on public institutions goes beyond property rights. Markets are not self-regulating, self-stabilizing, or self-legitimizing. Businessmen seldom meet together, complained Adam Smith, without the conversation ending up in a “conspiracy against the public.” In the

³ Jacques Barzun, From Dawn to Decadence: 500 Years of Western Cultural Life, Perennial, New York, 2000, p. 172.

absence of regulations pertaining to anti-trust, information disclosure, prudential limits, public health and safety, and environmental and other externalities, markets can hardly do their job correctly. Without a lender-of-last-resort and a public fisc, markets are prone to wild gyrations and periodic bouts of underemployment. And without safety nets and social insurance to temper risks and inequalities, markets cannot retain their legitimacy for long. The genius of capitalism, where it works, is that it has managed to continually re-invent the institutional underpinnings of a self-sustaining market economy: central banking, stabilizing fiscal policy, antitrust and regulation, social insurance, political democracy.

What is generally less well understood is that the institutional basis of market economies is not unique. Creating, regulating, stabilizing, or legitimating markets are *functions* that do not map into specific institutional *forms*. Consider property rights, for example. What is relevant from an economic standpoint is whether current and prospective investors have the assurance that they can retain the fruits of their investments—and not the precise legal form that this assurance takes. China, to take an extreme but illustrative example, has managed to provide investors with this assurance despite the complete absence of *private* property rights. Institutional innovations in the form of the Household Responsibility System or the Township and Village Enterprises, it turns out, have served as functional equivalents of a private-enterprise economy. How else can we explain the tremendous burst in entrepreneurial activity that has taken place in China since the reforms of the late 1970s? By contrast, many countries fail to provide investors with effective control rights over cash flow even though private property rights are nominally protected. Russia during the 1990s provides a good example of the latter.

Perhaps the best way to observe that market economies are compatible with diverse institutions is to note the variety that exists among today's advanced countries. The United

States, Europe, and Japan are all successful societies: they have each produced comparable amounts of wealth over the long term. Yet their institutions in labor markets, corporate governance, regulation, social protection, and banking and finance have differed greatly. Scandinavia was everyone's favorite in the 1970s; Japan became the model to emulate in the 1980s; and the United States was the undisputed king of the 1990s. Such predictable changes in institutional fashions should not blind us to the reality that none of these models can be deemed a clear winner in the contest of "capitalisms." Furthermore, despite much talk about convergence in recent years, there have been few real signs of it. Financial systems (and to a much lesser extent corporate governance regimes) have tended to move towards an Anglo-American model. But labor market arrangements (as captured by union membership or collective bargaining coverage rates) have in fact diverged.⁴

There are good reasons for institutional diversity, and for why national institutions are resistant to convergence. For one thing, societies differ in the values and norms that shape their institutional choices. To take an obvious example, Americans and Europeans tend to have different views as regards the determinants of economic outcomes: compared to Americans, Europeans put greater weight on luck and smaller weight on individual effort.⁵ Europeans correspondingly favor extensive redistribution and social protection schemes. Americans, for

⁴ On the limited convergence in effective patterns of corporate governance, see Colin Mayer, "Corporate Cultures and Governance: Ownership, Control, and Governance of European and US Corporations," Saïd Business School, University of Oxford, unpublished paper, March 2002, and Tarun Khanna, Joe Kogan, and Krishna Palepu, "Globalization and Corporate Governance Convergence? A Cross-Country Analysis," Harvard Business School, unpublished paper, October 2001. On divergence in labor market institutions, see Richard Freeman, "Single Peaked vs. Diversified Capitalism: The Relation Between Economic Institutions and Outcomes," National Bureau of Economic Research Working Paper 7556, Cambridge, MA, February 2000.

⁵ For an analysis of differences in attitudes towards inequality, see Alberto Alesina, Rafael di Tella, and Robert MacCulloch, "Inequality and Happiness: Are Europeans and Americans Different?" National Bureau of Economic Research Working Paper 8198, Cambridge, MA, April 2001.

their part, tend to focus on equality of opportunity and tolerate much larger amounts of inequality.

There is a second, subtler reason for the absence of convergence in institutional arrangements. Different elements of a society's institutional configuration tend to be mutually reinforcing. Consider, for example, the manner in which Japanese society provides its citizens with social protection. Unlike Europe, the Japanese government does not maintain an expensive welfare state financed by transfers from taxpayers. Instead, social insurance has been provided in the postwar period through a combination of elements unique to "Japanese-style" capitalism: lifetime employment in large enterprises, protection of agriculture and small-scale services ("mom-and-pop" stores), government-organized cartels, and regulation of product markets. All of these have in turn repercussions for other parts of the institutional landscape. One implication of these arrangements is that they strengthen "insiders" (managers and employees) relative to "outsiders" (shareholders) and therefore necessitate a different corporate governance model than the Anglo-American one: in Japan, "insiders" have traditionally been monitored and disciplined not by shareholders but by banks.⁶ In the United States, by contrast, the prevailing model of shareholder-value maximization privileges profits over the interests of insiders and other "stakeholders." But the flip side of this is that profit-seeking behavior is constrained by the toughest anti-trust regime in the world. It is difficult to imagine governments in Europe or Japan humiliating their premier high-tech company the way that U.S. has done with Microsoft.

With such mutual dependence among the different parts of the institutional landscape, anything short of comprehensive change can be quite disruptive, and is therefore difficult to

⁶ See Masahiko Aoki, "Unintended Fit: Organizational Evolution and Government Design of Institutions in Japan," in M. Aoki et al, eds., The Role of Government in East Asian Economic Development: Comparative Institutional Analysis, Clarendon Press, Oxford, 1997.

contemplate in normal times. The result is what economists call “path dependence” or “hysteresis:” once the institutional setup performs reasonably successfully (and often when it is not), it gets locked in.

The last major category of reasons for institutional diversity has to do with the special needs of developing nations. Sparking and maintaining economic growth often requires institutional innovations that can depart significantly from American or Western ideals of “best practice.” Consider China again, the most spectacular case of success in the developing world in the last quarter century. A Western trained economist advising China in 1978 would have advocated the complete overhaul of the socialist economic regime: private property rights in land, corporatization of state enterprises, deregulation and price liberalization, currency unification, tax reform, reduction of import tariffs and elimination of quantitative restrictions on imports. China undertook few of these, and those that it did take on (such as currency unification and trade liberalization) were delayed for a decade or two after the onset of high growth. Instead, the Chinese leadership devised highly effective institutional shortcuts. The Household Responsibility System, Township and Village Enterprises, Special Economic Zones, and Two-Tier Pricing, among many other innovations, enabled the Chinese government to stimulate incentives for production and investment without a wholesale restructuring of the existing legal, social, and political regime.⁷

The Chinese experience represents not the exception, but the rule: transitions to high growth are typically sparked by a relatively narrow range of reforms that mix orthodoxy with domestic institutional innovations, and not by comprehensive transformations that mimic best-

⁷ See the discussion of “transitional institutions” in Yingyi Qian, “How Reform Worked in China,” in Dani Rodrik, ed., *In Search of Prosperity: Analytic Narratives on Economic Growth*, Princeton University Press, Princeton, NJ, forthcoming.

practice institutions from the West. South Korea and Taiwan since the early 1960s, Mauritius since the early 1970s, India since the early 1980s, and Chile since the mid-1980s are some of the more significant examples of this strategy.⁸

Institutional diversity versus deep integration

When economists talk about obstacles to global economic integration, they typically have in mind things like import tariffs, quantitative restrictions on trade, multiple currency practices, restrictive regulations on foreign borrowing and lending, and limitations on foreign ownership. The past few decades have witnessed unparalleled reduction in such barriers, as all of these have been eliminated or slashed across the globe. With the textbook impediments gone, one would have expected national economies to become seamlessly integrated with each other. But, to their surprise, economists have discovered that economic integration remains seriously incomplete.

To be sure, the volume of cross-border trade and investment flows has increased by leaps and bounds in recent decades. Still, when measured against the benchmark of *national* markets, international markets remain highly fragmented. A well-known study calculated that the volume of trade between two Canadian provinces is 20 times larger than trade between a province and an equidistant U.S. state across the border.⁹ While later academic studies have been able to reduce this large differential, they all confirm that national borders exert strong depressing effects on

⁸ This is why studies such as David Dollar and Aart Kraay's "Trade, Growth, and Poverty" (Development Research Group, The World Bank, unpublished paper, March 2001), which purport to show that "globalizers" grow faster than "non-globalizers," are so misleading. The countries used as exemplars of "globalizers" in these studies (China, India, Vietnam) have all employed heterodox strategies, and the last conclusion that can be derived from their experience is that trade liberalization, adherence to WTO strictures, and adoption of the "Washington Consensus" are the best way to generate economic growth. China (until recently) and Vietnam were not even members of the WTO, and together with India, these countries remain among the most protectionist in the world.

⁹ John McCallum, "National Borders Matter: Canada-U.S. Regional Trade Patterns," *The American Economic Review*, Vol. 85, No. 3. (Jun., 1995), pp. 615-623.

economic exchange.¹⁰ A different strand of the literature has focused on a related phenomenon trade economists call “missing trade.” This refers to the observation that factor flows (e.g., labor and capital) embodied in trade fall far short of what standard theories of comparative advantage predict. Given the very large differences in relative factor endowments across countries and the apparent absence of formal trade barriers, there is much less trade in “factor services” than there should be.¹¹

From an economic standpoint, what matters most is not the volume of trade as much as the degree of price convergence across national markets. Here too, the results have been disappointing. Prices of tradable commodities often diverge substantially across national markets, even after indirect taxes and retail costs are purged from the comparison.¹² Moreover, when prices do converge to a common level, the process of convergence tends to be slow, taking several years.¹³ All of these pieces of evidence point to the same conclusion: national borders continue to act as serious impediments to economic exchange, even though formal trade barriers have all but disappeared.

It may come as a surprise that the situation is not much different in capital markets. In a world of free capital mobility, households would place their wealth in internationally diversified portfolios, and the location of enterprises would not affect their access to financing. In reality,

¹⁰ See James E. Anderson and Eric van Wincoop, “Gravity with Gravitas: A Solution to the Border Puzzle,” National Bureau of Economic Research Working Paper 8079, Cambridge, MA, January 2001.

¹¹ The standard reference on this is Daniel Trefler, “The Case of the Missing Trade and Other Mysteries,” *The American Economic Review*, Vol. 85, No. 5. (Dec., 1995), pp. 1029-1046.

¹² For example, Scott Bradford estimates that domestic prices of motorcycles and bicycles exceed world prices by 100% in the U.K., 76% in Belgium, and 60% in Germany. For these and other estimates, see Bradford, “Paying the Price: The Welfare and Employment Effects of Protection in OECD Countries,” Economics Department, Brigham Young University, December 2000, unpublished paper, Table 2.

¹³ See the survey by Kenneth S. Rogoff, “The Purchasing Power Parity Puzzle,” *Journal of Economic Literature*, Vol. 34, No. 2. (Jun., 1996), pp. 647-668.

financial markets are subject to a great amount of “home bias.” Investments in plant and equipment are still constrained by the availability of domestic savings and portfolios remain remarkably parochial.¹⁴ Even in periods of exuberance, *net* capital flows between rich and poor nations fall considerably short of what theoretical models would predict. And in periods of panic, which occur with alarming frequency, capital flows from North to South can dry up in an instant. Global foreign exchange markets may turn over \$1.5 trillion in a single day, but any investor who acts on the assumption that it’s all one big capital market out there and national borders don’t matter would be in for a big surprise—sooner rather than later.

Where do these border barriers arise from if not from attempts by governments to directly restrict trade and capital flows? We are now in a position to link this discussion with the previous one on institutional diversity. The key point is that national borders, and the institutional boundaries that they define, impose a wide array of transaction costs. Institutional and jurisdictional discontinuities serve to segment markets in much the same way that transport costs or import taxes do.

These transaction costs arise from various sources. Most obviously, contract enforcement is more problematic across national boundaries than it is domestically. Domestic courts may be unwilling--and international courts unable--to enforce a contract signed between residents of two different countries. This problem exists across the board, but is particularly severe in the case of capital flows as financial contracts inevitably involve a promise to repay. A key reason why more capital does not flow to poorer countries is that there is no good way such

¹⁴ Linda Tesar and Ingrid Werner, “The Internationalization of Securities Markets since the 1987 Crash,” in R. Litan and A. Santomero, eds., Brookings-Wharton Papers on Financial Services, The Brookings Institution, Washington, DC, 1998.

a promise can be rendered binding across national jurisdictions—short of resorting to the gunboat diplomacy of old.

Often, contracts are implicit rather than explicit, in which case they require repeated interaction between the parties or side constraints to make them sustainable. In the domestic context, implicit contracts are often "embedded" in social networks, which allow incentives to be aligned properly by providing sanctions against opportunistic behavior. One of the things that keep businessmen honest is fear of social ostracism. The role played by ethnic networks in fostering cross-border trade and investment linkages (as in the case of the Chinese in Southeast Asia) is indicative of the importance of group ties in facilitating economic exchange.¹⁵ But such ties are generally harder to set up across national borders, in the absence of fortuitous ethnic and other social linkages. More broadly, the poor quality of national institutions and the lack of adequate protection of property rights in many developing countries is a serious handicap for these countries' effective participation in the international economy.

Transaction costs also result from national differences in regulatory regimes and in the rules of doing business—informal as well as legal. That such differences raise the cost of buying, selling, and investing across national boundaries is one of the most frequent complaints heard from businessmen around the world. Indeed, trade conflicts are increasingly the consequence of these differences. When the United States blames Japan's retail distribution practices for keeping Kodak out of the Japanese market or when it lodges a complaint against the EU in the WTO because of the latter's ban on hormone treated beef, what is at issue is the impact that different styles of regulation have on international trade. These complaints do not go in a unique direction. Developing nations have won WTO judgments against the U.S. that centered

¹⁵ See Alessandra Casella and James Rauch, "Anonymous Market and Group Ties in International Trade," National Bureau of Economic Research Working Paper W6186, September 1997.

on gasoline standards and fishing regulations enacted pursuant to the U.S. Clean Air Act and the U.S. Endangered Species Act—on the grounds that these regulations were harmful to their sales of gasoline and shrimp, respectively. Trade negotiations have correspondingly become more focused on harmonizing such regulatory differences away. In the Uruguay Round, a major victory for this agenda was the Agreement on Trade Related Aspects of Intellectual Property Rights (TRIPs), which established a minimum patent length requirement. In the area of international finance, a similar push is under way through the promulgation of a series of codes and standards on corporate governance, capital adequacy, bank regulation, accounting, auditing, and insurance.

In sum, national borders stand in the way of deep economic integration because they demarcate institutional boundaries. One conclusion, and the one that many economists have drawn, is that the way forward is to offset these centrifugal forces through international agreements, harmonization and standard setting. That, after all, is how the economic gains from further integration can be reaped. But, as I have argued earlier, diversity in national institutions serves a real and useful purpose. It is rooted in national preferences, sustains social compacts, and allows developing nations to find their way out of poverty. There is no easy choice here.

The political trilemma of the global economy

The tradeoffs can be illustrated with the help of Figure 1, which displays what I call the political trilemma of the global economy.¹⁶ The key message of the figure is that the nation-state system, deep economic integration, and democracy are mutually incompatible. We can have at

¹⁶ The discussion of this trilemma draws heavily on my “How Far Will International Economic Integration Go?” *Journal of Economic Perspectives*, Winter 2000.

most two out of these three. If we want to push global economic integration much further, we have to give up either the nation state or mass politics. If we want to maintain and deepen democracy, we have to choose between the nation state and international economic integration. And if we want to keep the nation state, we have to choose between democracy and international economic integration.

To see the logic in this, consider a hypothetical perfectly integrated world economy in which national borders do not interfere with exchange in goods, services or capital. Transaction costs and tax differentials would be minor; convergence in commodity prices and factor returns would be almost complete. Is such a world compatible with the nation-state system? Can we maintain the nation-state system largely as is, but ensure that national jurisdictions—and the differences among them—do not get in the way of economic transactions? Possibly, if nation states were to singularly focus on becoming attractive to international markets. National jurisdictions, far from acting as an obstacle, would then be geared towards maximizing international commerce and capital mobility. Domestic regulations and tax policies would be either harmonized according to international standards, or structured such that they pose the least amount of hindrance to international economic integration. The only public goods provided would be those that are compatible with integrated markets.

It is possible to envisage a world of this sort, and in fact many commentators believe we already live in it. Governments today try to outdo each other in pursuing policies that they believe will earn them market confidence and attract trade and capital inflows: tight money, small government, low taxes, flexible labor legislation, deregulation, privatization, and openness all around. These are the policies that comprise what Thomas Friedman (1999) has aptly termed the Golden Straitjacket. As Friedman notes, the price of maintaining national sovereignty while

markets become international is that politics has to be exercised over a much narrower domain.

"As your country puts on the Golden Straitjacket," Friedman writes (1999, 87),

two things tend to happen: your economy grows and your politics shrinks.... [The] Golden Straitjacket narrows the political and economic policy choices of those in power to relatively tight parameters. That is why it is increasingly difficult these days to find any real differences between ruling and opposition parties in those countries that have put on the Golden Straitjacket. Once your country puts on the Golden Straitjacket, its political choices get reduced to Pepsi or Coke--to slight nuances of tastes, slight nuances of policy, slight alterations in design to account for local traditions, some loosening here or there, but never any major deviation from the core golden rules.

The crowding out of democratic politics gets reflected in the insulation of economic policy making bodies (central banks, fiscal authorities, and so on), the disappearance (or privatization) of social insurance, and the replacement of developmental goals with the need to maintain market confidence. Once the rules of the game are set by the requirements of the global economy, domestic groups' access to, and their control over, national economic policy-making has to be restricted.

No country went farther down this path in the 1990s than Argentina, which looked for a while like the perfect illustration of Friedman's point. Argentina's ultimate collapse carries an important lesson for this discussion. Argentina undertook more trade liberalization, tax reform, privatization, and financial reform than virtually any other country in Latin America. It did everything possible to endear itself to international capital markets. Obtaining investment-grade rating—the ultimate mark of approval by international markets—became the Argentine government's first priority.¹⁷ Why did international investors nonetheless abruptly abandon the country as the decade was coming to a close?

¹⁷ The much-maligned currency board system, originally aimed at stopping inflation, eventually became part of this same strategy. A government that was prevented from printing money, it was felt, would be more attractive to foreign investors.

Whatever financial markets feared, it could not have been a lack of commitment by the political leadership to pay back the foreign debt. Indeed, during the course of 2001 President de la Rúa and economy minister Cavallo abrogated their contracts with virtually all domestic constituencies--public employees, pensioners, provincial governments, bank depositors--so as to not skip one cent of their obligations to *foreign* creditors. What ultimately sealed Argentina's fate in the eyes of financial markets was not what Cavallo and de la Rúa were doing, but what the Argentine people were willing to accept. Markets grew increasingly skeptical that the Argentine congress, provinces, and common people would tolerate the policy of putting foreign obligations before domestic ones. And in the end the markets were proven correct. After a couple of days of mass protests and riots just before Christmas, Cavallo and de la Rúa had to resign in rapid succession.

So Argentina's lesson has proved to be a different one than Friedman's: Mass politics casts a long shadow on international capital flows, even when political leaders single-mindedly pursue the agenda of deep integration. In democracies, when the demands of foreign creditors collide with the needs of domestic constituencies, the former eventually yield to the latter. When push comes to shove, democracy shoves the Golden Straitjacket aside.

Conceptually, an obvious alternative is to drop nation states rather than democratic politics. This is the solution of "global federalism" shown in Figure 1. Global federalism would align jurisdictions with markets, and remove the "border effects." Politics need not, and would not, shrink: it would relocate to the global level. This is the United States model expanded on a global scale. Despite the continuing existence of differences in regulatory and taxation practices among states, the presence of a national constitution, national government, and federal judiciary ensures that markets in the U.S. are truly national. The European Union, while very far from a

federal system at present, is headed broadly in the same direction. Under global federalism national governments would not necessarily disappear, but their powers would be severely circumscribed by supranational legislative, executive, and judicial authorities.

If this sounds like pie in the sky, it is. The historical experience of the U.S. shows how tricky it is to establish and maintain a political union in the face of large differences in institutional arrangements in the constituent parts. The halting way in which political institutions within the EU have developed and the persisting complaints about their democratic deficit are also indicative of the difficulties involved--even when the union encompasses a group of nations at similar income levels and with similar historical trajectories. Federalism on a truly global scale is at best a century away.

The only remaining option is to sacrifice the goal of deep economic integration. I have termed this the Bretton Woods compromise in Figure 1. The essence of the Bretton Woods-GATT regime was that countries were free to dance to their own tune as long as they removed a number of border restrictions on trade and generally did not discriminate among their trade partners.¹⁸ They were allowed (indeed encouraged) to maintain restrictions on capital flows, as Keynes and the other architects of the postwar economic order did not believe that a system of free capital flows was compatible with domestic economic stability. Even though an impressive amount of trade liberalization was undertaken during successive rounds of GATT negotiations, there were also gaping exceptions. Services, agriculture and textiles were effectively left out of the negotiations. Various clauses in the GATT (on anti-dumping and safeguards, in particular) permitted countries to erect trade barriers when their industries came under severe competition

¹⁸ John Ruggie has written insightfully on this, describing the system that emerged as "embedded liberalism." See his "International Regimes, Transactions, and Change: Embedded Liberalism in the Postwar Economic Order," in Stephen D. Krasner, ed., International Regimes, Cornell University Press, Ithaca, NY, 1983.

from imports. And developing country policies were effectively left outside the scope of international discipline.

Until roughly the 1980s, these loose rules left enough space for countries to follow their own, possibly divergent paths of development. Western Europe chose to integrate within itself and to erect an extensive system of social insurance. Japan caught up with the West using its own distinctive brand of capitalism, combining a dynamic export machine with large doses of inefficiency in services and agriculture. China grew by leaps and bounds once it recognized the importance of private initiative, even though it flouted every other rule in the guidebook. Much of the rest of East Asia generated an economic miracle relying on industrial policies that have since been banned by the WTO. And scores of countries in Latin America, the Middle East, and Africa generated unprecedented economic growth rates until the late 1970s under import-substitution policies that insulated their economies from the world economy.

The Bretton Woods compromise was largely abandoned in the 1980s as the liberalization of capital flows gathered speed and trade agreements began to reach behind national borders. We have since been trapped in the uncomfortable (and unsustainable) zone somewhere in between the three nodes of Figure 1. Neither of the alternatives to the Bretton Woods compromise provides a real way forward. The Golden Straitjacket may be feasible, but it is not desirable. Global federalism may be desirable, but it is not feasible. If the principal locus of democratic politics is to remain the nation state, we have to lower our sights on economic globalization. We have no choice but to settle for a “thin” version of globalization—to reinvent the Bretton Woods compromise for a different era.

Alternative globalizations: example of labor mobility

What kind of globalization should we strive for then? Posing the question is important in its own right, as it makes us aware that there are real choices to be made. Global economic rules are not written by Platonic rulers, or their present-day pretenders, academic economists. If WTO agreements were truly about “free trade,” as their opponents like to point out, a single sentence would suffice (“there shall be free trade”). The reality of course is that there is considerable politics in agenda setting and rule making—and those who have power get more out of the system than those who do not. While this is well understood at some level, advocates of globalization have to a tendency to present their agenda with an air of inevitability, as if it has a natural logic that only economic illiterates would reject. Recognizing that there is a multiplicity of feasible globalizations—as there is a multiplicity of institutional underpinnings for capitalist economies—would have an important liberating effect on our policy discussions.

To make the point as starkly as possible, consider the following thought experiment. Imagine that the negotiators who recently met in Doha to hammer out an agenda for world trade talks were really interested in boosting incomes around the world. Imagine further that they really meant it when they said the new round would be a “development round,” i.e., one designed to bring maximum benefit to poor countries. What would they have focused on? Increasing market access for developing country exports? Reform of the agricultural regime in Europe and other advanced countries? Intellectual property rights and public health in developing nations? Rules on government procurement, competition policy, environment, or trade facilitation?

The answer is none of the above. These are areas where the benefits to developing countries are slim at best. The biggest bang by far lies in something that was not even on the agenda at Doha: relaxing restrictions on the international movement of workers. This would

produce the largest possible gains for the world economy, and for poor countries in particular. Nothing else comes close to the magnitude of economic benefits that this would generate.

We know this because of a simple principle of economics. The income gains that derive from international trade rise with the square of the price differentials across national markets. Compare in this respect markets in goods and financial assets, on the one hand, with markets for labor services, on the other. Removal of restrictions in markets for goods and financial assets has narrowed the scope of price differentials in these markets (although not done away with them completely, as we have seen). Remaining price wedges rarely exceed a ratio of 2 to 1. Meanwhile, there has been virtually no liberalization of markets for cross-border labor services. Consequently, wages of similarly qualified individuals in the advanced and low-income countries can differ by a factor of 10 or more. Applying the economics principle enunciated above, liberalizing cross-border labor movements can be expected to yield benefits that are roughly 25 times larger than those that would accrue from the traditional agenda focusing on goods and capital flows!

It follows that even a minor liberalization of international labor flows would create gains for the world economy that are much larger than the combined effect of all the post-Doha initiatives under consideration. Consider for example a *temporary* work visa scheme that amounts to no more than 3 percent of the rich countries' labor force. Under the scheme, skilled and unskilled workers from poor nations would be allowed employment in the rich countries for 3-5 years, to be replaced by a new wave of inflows upon return to their home countries. A back-of-the-envelope calculation indicates that such a system would easily yield \$200 billion annually for the citizens of developing nations, vastly more than the existing estimates of the gains from the current trade agenda. The positive spillovers that the returnees would generate for their home

countries—the experience, entrepreneurship, investment, and work ethic they would bring back with them and put to work—would add considerably to these gains. What is equally important, the economic benefits would accrue directly to workers from developing nations. We would not need to wait for trickle-down to do its job.

Relaxing restrictions on cross-border flows through temporary work contracts and other schemes has a compelling economic logic, but is it politically feasible? One concern is that such flows would have adverse distributional implications in labor markets of advanced countries. In particular, wages of low-skill workers would be depressed. A second concern is that immigration is already highly unpopular in many industrial countries. Indeed, worries about crime and other social problems (as well as racism) have made immigration a hot political issue in an increasing number of rich countries. Third, might increased labor flows enhance the threat of terrorism in our post-September 11 world? All of these suggest that pushing for larger worker inflows may well amount to political suicide.

But while opposition to immigration is real, the political factors at work are subtler than is commonly supposed. Imports from developing countries—which are nothing other than inflows of embodied labor services—create the same downward pressure on rich country wages as immigration, and that has not stopped policymakers from bringing trade barriers down. The bias towards trade and investment liberalization is certainly not due to the fact that that is politically popular at home (whereas labor flows are not). The median voter in the advanced countries is against both immigration *and* imports: fewer than 1 in 5 Americans and Britons reject import restrictions when they are asked their views on trade policy. In these countries, the proportion of voters who want to expand imports tends to be about the same or lower than the proportion that believe immigration is good for the economy. In any case, a well-designed

scheme of labor inflows can mitigate much of the concern regarding adverse distributional implications for the host countries. For example, we can imagine aligning the skill mix of “guest” workers with that of the natives—allowing in no more than one construction worker or fruit picker, say, for every physician or software engineer. Finally, there is no clear answer to the question of whether the world would be a safer place with a small, multilaterally-regulated regime of registered contract workers than it is presently. Arguments can be made in either direction.

If substantial liberalization of trade and investment has taken place, it is not because it has been popular with voters at home, but largely because the beneficiaries have organized successfully and become politically effective. Multinational firms and financial enterprises have been quick to see the link between enhanced market access abroad and increased profits, and they have managed to put these issues on the negotiating agenda. Temporary labor flows, by contrast, have not had a well-defined constituency in the advanced countries. This is not because the benefits are smaller, but because the beneficiaries are not as clearly identifiable. When a Turkish worker enters the European Union or a Mexican worker enters the U.S., the ultimate beneficiaries in Europe and the U.S. are not known *ex ante*. It is only after the worker lands a job that his employer develops a direct stake in keeping him in the country. This explains why, for example, the U.S. federal government spends a large amount of resources on border controls to prevent *hypothetical* immigrants from coming in, while it has virtually no ability to deport employed illegals or fine their employers once they are actually inside the country. The same principle also explains why significant relaxations on labor restrictions do come about occasionally, but only in response to pressure from well-organized interest groups such as agricultural producers or Silicon Valley firms.

The lesson is that political constraints can be malleable. Economists have remained excessively tolerant of the political realities that underpin the highly restrictive regime of international labor mobility, even as they continually decry the protectionist forces that block further liberalization of an already very open trading system.

To ensure that labor mobility produces benefits for developing nations it is imperative that the regime be designed in a way that generates incentives for return to home countries. While remittances can be an important source of income support for poor families, they are generally unable to spark and sustain long-term economic development. Designing contract labor schemes that are truly temporary is tricky, but it can be done. Unlike previous such schemes, there need to be clear incentives for all parties—workers, employees, and home and host governments—to live up to their commitments. One possibility would be to withhold a portion of workers' earnings until return takes place. This forced saving scheme would also ensure to workers would come back home with a sizeable pool of resources to invest. In addition, there could be penalties for home governments whose nationals failed to comply with return requirements. For example, sending countries' quotas could be reduced in proportion to the numbers that fail to return. That would increase incentives for sending government to do their utmost to create a hospitable economic and political climate at home and to encourage their nationals' return.

In the end, it is inevitable that the return rate will fall short of 100 percent. But even with less than full compliance, the gains from reorienting our priorities towards the labor mobility agenda remain significant.

Concluding remarks

I have highlighted two shortcomings of the current discussion on globalization. First, there is inadequate appreciation of the fact that economic globalization is necessarily limited by the scope of desirable institutional diversity at the national level. Under current political configurations and economic realities, deep integration is a utopia. Second, there are many possible models of “feasible globalization,” with different implications for economic benefits and their incidence. As my discussion of labor mobility illustrates, we are not focusing currently on areas of economic integration where the biggest gains are. The hopeful message is that it is possible to squeeze much additional mileage out of globalization, while still remaining within the boundaries of feasibility I have identified.

THE POLITICAL TRILEMMA OF THE WORLD ECONOMY

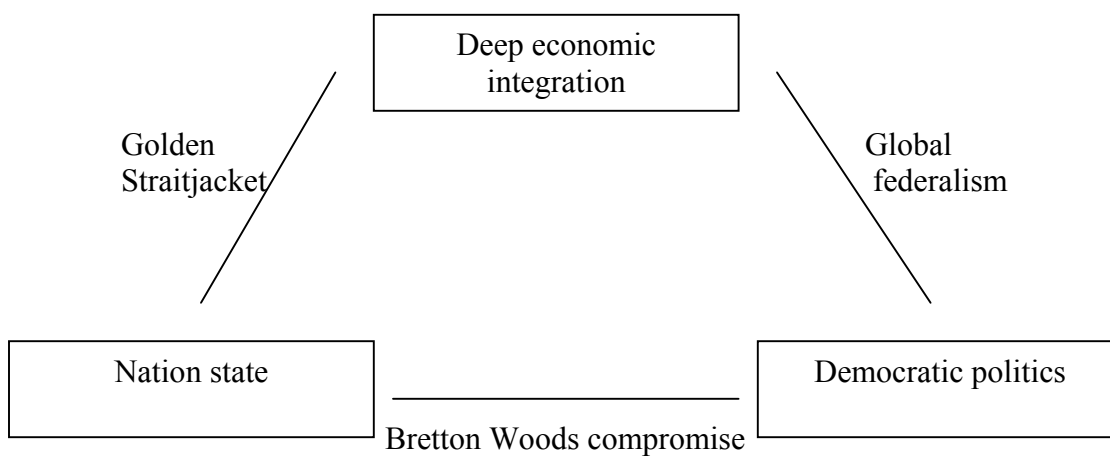


Figure 1: Pick two, any two

The Global Governance of Trade

As If

Development
Really Mattered

Dani Rodrik

October 2001

UNITED NATIONS DEVELOPMENT PROGRAMME

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Social Development Group
Bureau for Development Policy
United Nations Development Programme
One UN Plaza, 20th floor
New York, NY 10017

<http://www.undp.org/bdp>

This is a background paper to the UNDP project on Trade and Sustainable Human Development. The responsibility for opinions in this paper rests solely with its author, and publication does not constitute an endorsement by the United Nations Development Programme or the institutions of the United Nations system.

Background papers are designed to generate discussion and feedback on issues of trade and sustainable human development for a series of consultations culminating in the UNDP Trade and Human Development Report in 2002.

Design: VanGennep Design

About the Author

Dani Rodrik is the Rafiq Hariri Professor of International Political Economy at the John F. Kennedy School of Government, Harvard University. He has published widely in the areas of international economics, economic development, and political economy. What constitutes good economic policy and why some governments are better than others in adopting it are the central questions on which his research focuses.

Rodrik is the research coordinator of the Group of 24 (G-24), and is also affiliated with the National Bureau of Economic Research and the Centre for Economic Policy Research (London). He is the recipient of a Carnegie Scholar award for 2001, and his work has been supported also by the Ford and Rockefeller Foundations. He is the faculty chair of the new MPA in International Development (MPAID) degree programme at Harvard. He holds a Ph.D. in economics and an MPA from Princeton University, and an A.B. from Harvard College.

Preface

Events surrounding the WTO Ministerial meeting in Seattle in late 1999 became a kind of Rorschach test for how different constituencies view globalization—how different people and groups look at the same pictures but draw different meanings from them. Many developing country governments noted the asymmetry in the multilateral trading regime, which they viewed as dominated by a narrow agenda of a few industrialized countries, thereby marginalizing the genuine development concerns of the vast majority of the people. Civil society organizations (CSOs) from both the South and North, for their part, were equally upset that their constituencies' many concerns were once again excluded from the intergovernmental discussions and negotiations.

The breakdown in Seattle opened up the opportunity for a much-needed breathing space to discuss and debate the significance of trade for achieving the Millennium Development Goals (MDGs). The controversy surrounding the global trading system is not about whether trade is necessary, but about how the multilateral trade regime can operate in ways that support and foster human development.

As the dust settled on Seattle, we were convinced that given UNDP's vanguard role in advocating for human development and its 1999 Human Development Report on Globalization, our organization had a special responsibility to contribute to the trade debate. Our response was to conceptualize, design and implement a project, which came to be known as UNDP's Trade and Sustainable Human Development project.

The project was approved in June 2000 and has four main phases; first, the commissioning of several respected scholars and experts to write consultant papers on different aspects of trade and its global governance from a human development perspective; second, the convening of an advisory team of concerned and internationally respected government trade negotiators and diplomats, academics, civil society activists and senior UN colleagues to critically assess the consultant paper outlines and advise on the overall project strategy; third, the use of the draft papers as inputs into a series of consultations with both developing country governments and civil society organizations, both to obtain their feedback on them and understand their concerns more fully; and last but not least, drawing upon all of these and other inputs, to prepare a UNDP report tentatively entitled 'Trade and Sustainable Human Development.'

The UNDP project has had three interrelated objectives:

- To assist developing country governments and civil society organizations in ensuring that their countries can selectively and strategically seize the opportunities of global economic and trade integration for advancing national progress in human development and poverty eradication;
- To strengthen the participation and substantive negotiating and advocacy posi-

tions of developing countries in the debate and negotiations on the emerging global trading regime;

- To present a UNDP position on the human development outcomes of the current global trading regime and the reforms needed to make it more inclusive and balanced, thereby enabling trade to become an instrument for enhancing human development and reducing poverty.

While consultations continue and UNDP's report is under preparation, the three consultant papers commissioned as part of the project are being made available. Indeed, an important part of the commitment of the project was to publish, in their independent right, each of the papers. We believe that they deserve to be widely read and used to inform the current debate on trade and development.

This paper, by Professor Dani Rodrik of Harvard University, analyses the global governance of trade from a development perspective. Professor Rodrik looks at trade through a development lens, with particular emphasis on assessing the relationship between trade, growth and poverty. He provides an analysis of the strengths and weaknesses of the existing trading system. The assumptions underlying trade liberalization and its relationship with growth and poverty are critically analysed. Based on the evidence, the paper makes proposals for how the multilateral trade regime and its agreements and practices need to change to better serve the goals of human development. The paper makes suggestions to developing countries on a range of pertinent issues, including on the crucial question of the degree of trade openness which is likely to be consistent with development objectives and outcomes under different country circumstances.

We hope the reader will find the paper informative and useful as a contribution to the ongoing debate on trade and development.



Eimi Watanabe
Assistant Administrator and Director
Bureau for Development Policy
UNDP
October 2001

Executive Summary

It is widely accepted, not least in the agreement establishing the World Trade Organization (WTO), that the purpose of the world trade regime is to raise living standards all around the world—rather than to maximize trade per se. Increasingly, however, the WTO and multilateral lending agencies have come to view these two goals—promoting development and maximizing trade—as synonymous, to the point where the latter easily substitutes for the former. The net result is a confounding of ends and means. Trade has become the lens through which development is perceived, rather than the other way around.

Imagine a trading regime in which trade rules are determined so as to maximize development potential, particularly that of the poorest nations in the world. Instead of asking, ‘How do we maximize trade and market access?’ negotiators would ask, ‘How do we enable countries to grow out of poverty?’ Would such a regime look different than the one that exists currently?

The answer depends on how one interprets recent economic history and the role that trade openness plays in the course of economic development. The prevailing view in G7 capitals and multilateral lending agencies is that economic growth is dependent upon integration into the global economy. Successful integration in turn requires both enhanced market access in the advanced industrial countries and a range of institutional reforms at home (ranging from legal and administrative reform to safety nets) to render economic openness viable and growth-promoting. This can be called the ‘enlightened standard view’—enlightened because of its recognition that there is more to integration than simply lowering tariff and non-tariff barriers to trade, and standard because it represents the conventional wisdom. In this conception, the WTO’s focus on expanding market access and deepening integration through the harmonization of a wide range of ‘trade-related’ practices is precisely what development requires.

This paper presents an alternative account of economic development, one which questions the centrality of trade and trade policy and emphasizes instead the critical role of domestic institutional innovations. It argues that economic growth is rarely sparked by imported blueprints and opening up the economy is hardly ever critical at the outset. Initial reforms instead tend to combine unconventional institutional innovations with some elements from the orthodox recipe. They are country-specific, based on local knowledge and experimentation. They are targeted to domestic investors and tailored to domestic institutional realities.

A reinvigorated focus on development and poverty reduction, along with an empirically based understanding of the development process, would have far-reaching implications for the manner in which the international trading regime and the WTO function. This paper makes the case for such a reorientation, arguing that developing countries are short-changing themselves when they focus their complaints on specific asymmetries in market access (tariff

peaks against developing country exports, industrial country protection in agriculture and textiles, etc.). They would be better served by pressing for changes that enshrine development at the top of the WTO agenda, and thereby provide them with a better mix of enhanced market access and room to pursue appropriate development strategies.

Growth vs. Poverty Reduction

The paper first takes up the debate about whether growth or poverty reduction strategies yield the greatest benefits, and argues that the distinction is not significant, since policies targeted at the poor generally tend to have growth payoffs. Even so, poverty reduction is a worthwhile policy goal in itself, for three reasons: 1) growth is not a sufficient measure of social welfare, since it ignores both the level and distribution of income, and competing growth strategies may have different payoffs for the poor; 2) interventions to help the poor may be the best way to raise average incomes, since they seek to close gaps between private and social costs; and 3) policies that target poverty reduction seek to maximize people's capabilities, including those of the poor, thus contributing to more sustainable development. The problem with current trade rules is not that they over-emphasize trade and growth at the expense of poverty reduction, but that they over-emphasize trade at the expense of poverty reduction *and* growth.

Alternative Development Strategies

Turning to the determinants of economic growth, the paper discusses the enlightened standard view, which grew out of the failures of the Washington Consensus policies of the 1980s and 1990s. This view goes beyond liberalization and privatization to include the need for financial regulation and supervision, legal and administrative reform, labour market flexibility and social safety nets. Its reforms, however, are biased towards an Anglo-American conception of institutional soundness and are driven largely by the requirements of integration into the world economy. Needed instead is an approach that emphasizes domestic institutional innovations (comprising a mix of orthodoxy with 'local heresies') and of investment strategies tailored to each country.

This argument is supported by an examination of three types of successful development strategies: 1) import substitution strategies, based on (temporary) import protection for home producers, as done successfully in scores of developing countries during the 1960s and early 1970s; 2) outward oriented industrialization strategies, as pursued by the East Asian tigers in the 1980s, in which export led growth was made possible by government support of private investment, including credit subsidies, tax incentives, duty free access to inputs and capital goods as well as educational and infrastructural development; and 3) two-track reform strategies, as pursued for example by China and Mauritius in the late 1970s, that combine market liberalization and state regulation in different ways.

Trade Liberalization, Growth and Poverty Reduction

The third section examines the literature on trade policy and economic performance, which forms the basis for the oft-heard statements on the benefits of trade openness, and concludes that there is no convincing evidence that trade liberalization is predictably associated with subsequent economic growth. The claims for such links arise from the misattribution of macroeconomic phenomena (overvalued currencies, macroeconomic instability), institutional

failures, or geographical location to trade policies. The only systematic relationship is that countries dismantle trade restrictions as they get richer, which accounts for the fact that most of today's rich countries embarked on economic growth behind protective barriers, which they subsequently lowered. This raises serious questions about the priority placed on integrationist policies in orthodox reform programmes. The problem is not trade liberalization per se, but the diversion of financial resources and political capital from more urgent development priorities.

To elaborate this point, the paper next presents some trade-offs faced by developing countries in deciding to implement WTO agreements, which reflect little concern for needed development priorities. Bilateral and regional trade agreements are often worse in terms of the obligations required in exchange for enhanced market access. Moreover, their emphasis on eliminating the state from the formulation or regulation of economic policy undermines state capacity to undertake the institutional reforms necessary to benefit from global integration.

General Principles

The final section of the paper develops some general principles for a world trade regime that puts development first. Such a regime would accept institutional diversity and the right of countries to 'protect' their institutional arrangements—so long as they do not seek to impose it on others. Once these principles are accepted and internalized in trade rules, priorities of poor nations and the industrial countries can be rendered compatible and mutually supportive. An 'opt-out mechanism' would essentially extend the existing safeguard agreement to permit countries to restrict trade or suspend WTO obligations for reasons that include social and distributional goals as well as development priorities. This would require replacing the serious injury test with the need to demonstrate broad domestic support for the proposed measure among all relevant parties—including exporters and importers as well as consumer and public interest groups—and could be complemented by WTO monitoring as well as an automatic sunset clause.

The WTO is devoted largely to bargaining over market access. 'Free trade' is not the typical outcome of this process; nor is consumer welfare what negotiators prioritize. Instead, the negotiating agenda has been shaped in response to a tug-of-war between exporters and multinational corporations in the advanced industrial countries on one side, and import-competing interests (typically, but not solely, labour) on the other. The differential treatment of manufactures and agriculture, or of clothing and other goods within manufacturing, the anti-dumping regime, and the intellectual property rights (IPR) regime, for example, are all a result of this *political* process. There is little in the structure of the negotiations to ensure that their outcomes are consistent with development goals, let alone that they seek to further development.

One result of a shift to a development focus would be that developing nations articulate their needs not in terms of market access, but in terms of the policy autonomy needed to exercise institutional innovations. Another is that the WTO should function to manage the interface between different national systems rather than to reduce national institutional differences. The most obvious advantage would be a more development-friendly international economic environment. Countries would be able to use trade as a means for development,

rather than being forced to view trade as an end in itself (and thereby sacrifice development goals). It would save developing countries precious political capital by obviating the need to bargain for ‘special and differential treatment’—a principle that in any case is more form than substance at this point.

In addition, viewing the WTO as managing institutional diversity gets developing countries out of a negotiating conundrum that arises from the inconsistency between their demands for flexibility to implement their development policies, on the one hand, and their complaints about Northern protectionism in agriculture, textiles, and labour and environmental standards, on the other. As long as the issues are viewed in market-access terms, developing countries will remain unable to defend their need for flexibility. And the only way they can gain enhanced market access is by restricting their own policy autonomy in exchange. Once the objective of the trade regime is viewed as letting different national economic systems prosper side by side—the debate can centre on each nation’s institutional priorities and how they may be rendered compatible.

Finally, the shift in focus provides a way to reconcile the perspectives of developing country governments, which complain about asymmetry in trade rules, and civil society organizations, primarily in the North, which charge that the system pays inadequate attention to values such as transparency, accountability, human rights and environmental sustainability. The often conflicting demands of these two groups—over issues such as labour and environmental standards or the transparency of the dispute settlement process—have paralyzed the multilateral trade negotiation process and allowed the advanced industrial countries and the WTO leadership to seize the ‘middle’ ground.

Tensions over these issues become manageable if the debate is couched in terms of development processes—broadly defined—instead of the requirements of market access. Viewing the trade regime—and the governance challenges it poses—from a development perspective makes clear that developing country governments and NGO critics share the same goals: policy autonomy, poverty reduction, and environmentally sustainable human development.

The Global Governance of Trade As If Development Really Mattered

Introduction

What objectives does (or should) the World Trade Organization (WTO) serve? The first substantive paragraph of the Agreement establishing the WTO lists the following aspirations:

raising standards of living, ensuring full employment and a large and steadily growing volume of real income and effective demand, and expanding the production of and trade in goods and services, while allowing for the optimal use of the world's resources in accordance with the objective of sustainable development, seeking both to protect and preserve the environment and to enhance the means for doing so in a manner consistent with their respective needs and concerns at different levels of economic development. (WTO 1995:9)

A subsequent paragraph cites 'mutually advantageous arrangements directed to the substantial reduction of tariffs and other barriers to trade and to the elimination of discriminatory treatment in international trade relations' as a means of 'contributing to these objectives' (ibid.). It is clear from this preamble that the WTO's framers placed priority on raising standards of living and on sustainable development. Expanding trade was viewed as a means towards that end, rather than an end in itself. Recently, promoting economic development has acquired an even higher standing in the official rhetoric of the WTO, partly in response to its critics.¹

That the purpose of the world trade regime is to raise living standards all around the world—rather than to maximize trade per se—has never been controversial. In practice, however, these two goals—promoting development and maximizing trade—have increasingly come to be viewed as synonymous by the WTO and multilateral lending agencies, to the point where the latter easily substitutes for the former. As the WTO's Mike Moore (2000) puts it, 'the surest way to do more to help the poor is to continue to open markets.' This view has the apparent merit that it is backed by a voluminous empirical literature that identifies trade as a key determinant of economic growth. It also fits nicely with the traditional *modus operandi* of the WTO, which is to focus predominantly on

This is a paper prepared for the UNDP. I thank Kamal Malhotra, Yilmaz Akyuz, Murray Gibbs, Gerry Helleiner, Gita Sen, UNDP staff and participants in a brainstorming meeting held in New York City 13–14 October 2000 for guidance and suggestions. The paper draws extensively on several of my previous writings, including, most notably, Rodrik 2001a, 2001b, 2000a, 2000b and 1999.

reciprocal market access (instead of development-friendly trade rules). However, the net result is a confounding of ends and means. Trade becomes the lens through which development is perceived, rather than the other way around.

Imagine a trading regime that is true to the WTO preamble, one in which trade rules are determined so as to maximize development potential, particularly of the world's poorest nations. Instead of asking, 'How do we maximize trade and market access?' negotiators would ask, 'How do we enable countries to grow out of poverty?' Would such a regime look different from the one that exists currently?

The answer depends on how one interprets recent economic history and the role that trade openness plays in the course of economic development. The prevailing view in G7 capitals and multilateral lending agencies is that integration into the global economy is an essential determinant of economic growth. Successful integration in turn requires both enhanced market access in the advanced industrial countries and a range of institutional reforms at home (ranging from legal and administrative reform to safety nets) to render economic openness viable and growth promoting. This can be regarded as the 'enlightened standard view'—enlightened because of its recognition that there is more to integration than simply lowering tariff and non-tariff barriers to trade, and standard because it represents the prevailing conventional wisdom (see World Bank/IMF 2000). In this conception, today's WTO represents what the doctor ordered: the focus on expanding market access and deepening integration through the harmonization of a wide range of 'trade-related' practices is precisely what development requires.

This paper presents an alternative account of economic development, one that questions the centrality of trade and trade policy and emphasizes instead the critical role of domestic institutional innovations that often depart from prevailing orthodoxy. In this view, transitions to high economic growth are rarely sparked by blueprints imported from abroad. Opening up the economy is hardly ever a key factor at the outset. The initiating reforms instead tend to be a combination of unconventional institutional innovations with some of the elements drawn from the orthodox recipe. These combinations tend to be country-specific, requiring local knowledge and experimentation for successful implementation. They are targeted on domestic investors and tailored to domestic institutional realities.

In this alternative view, a development-friendly international trading regime is one that does much more than enhance poor countries' access to markets in the advanced industrial countries. It is one that enables poor countries to experiment with institutional arrangements and leaves room for them to devise their own, possibly divergent solutions to the developmental bottlenecks that they face. It is one that evaluates the demands of institutional reform not from the perspective of integration ('What do countries need to do to integrate?') but from the perspective of development ('What do countries need to do achieve broad-based, equitable economic growth?'). In this vision, the WTO would no longer serve as an instrument for the harmonization of economic policies and practices across countries, but become an organization that manages the interface between different national practices and institutions.

This paper argues that a renewed focus on development and poverty reduction,

along with an empirically-based understanding of the development process, would have far-reaching implications for the way in which the international trading regime and the WTO function. It focuses on broad principles, rather than specific recommendations, because it is only through a change in the overall perspective of trade negotiations that significant change can be accomplished.

One of the key propositions is that developing countries are short-changing themselves when they focus their complaints on specific asymmetries in market access (tariff peaks against developing country exports, industrial country protection in agriculture and textiles, etc.). This approach reflects acceptance of a market-access perspective that does developing countries limited good. They would be far better served by pressing for changes that enshrine development at the top of the WTO agenda, and correspondingly provide them with a better mix of enhanced market access and manoeuvring room to pursue appropriate development strategies.

Since this paper is as much about the approach to development that should inform views about the international trade regime as it is about the WTO itself, much of the discussion is devoted to the empirical content of these ideas. The paper begins with an assertion that the distinction between development strategies that focus on growth versus those that focus on poverty reduction is a false one, since in practice, the two ends are inseparable. The main strike against existing trade rules is not that they over-emphasize trade and growth at the expense of poverty reduction, but that they over-emphasize trade at the expense of poverty reduction *and* growth. It then argues that the enlightened standard development model encompasses an impossibly broad and unfocused development agenda, and one that is biased towards a particular set of institutional arrangements. It emphasizes instead the centrality of domestic institutional innovations (comprising a mix of orthodoxy with 'local heresies') and of investment strategies that are tailored to the circumstances of each country.

Much of the paper focuses on the link between trade policy and economic performance. The voluminous literature in this area, which forms the basis for the oft-heard claims to the benefits of trade openness, is, upon examination, less unequivocal. A close look reveals that there is no convincing evidence that trade liberalization is predictably associated with subsequent economic growth. This raises serious questions about the priority that the integrationist policy agenda typically receives in orthodox reform programmes. The problem is not trade liberalization per se, but the diversion of financial resources and political capital from more urgent and deserving developmental priorities.

Finally, the paper offers some general principles for a world trade regime that puts development first. First, the trade regime must accept, rather than seek to eliminate, institutional diversity, along with the right of countries to 'protect' their institutional arrangements. However, the right to protect one's own social arrangements is distinct from, and does not extend to, the right to impose it on others. Once these simple principles are accepted and internalized in trade rules, developmental priorities of poor nations and the needs of the industrial countries can be rendered compatible and mutually supportive.

Growth versus Poverty Reduction: A Meaningless Debate

Should governments pursue economic growth first and foremost, or should they focus on poverty reduction? Recent debate on this question has become embroiled in broader political controversies on globalization and its impact on developing economies. Critics of the WTO often take it to task for being overly concerned about the level of economic activity (and its growth) at the expense of poverty reduction. Supporters argue that expanded trade and higher economic growth are the best ways to reduce poverty. This largely sterile debate merely diverts attention from the real issues. In practice, economic growth and poverty reduction do tend to correlate very closely. However, the real question is (or ought to be) whether open trade policies are a reliable mechanism for generating self-sustaining growth *and* poverty reduction, the evidence for which is far less convincing.

Regarding the relationship between growth and poverty reduction, let's take some of the easier questions. Does growth benefit the poor? Yes, in general. The absolute number of people living in poverty has dropped in all of the developing countries that have sustained rapid growth over the past few decades. In theory, a country could enjoy a high average growth rate without any benefit to its poorest households, if income disparities grew significantly—that is, if the rich got richer while the incomes of the poor stagnated or declined. This is unlikely, however; income distribution tends to be stable over time, and rarely changes so much that the poor would experience an absolute decline in incomes while average incomes grow in a sustained fashion.

Moreover, to the extent that income distribution changes, its relationship to economic growth varies from country to country. Growth has been accompanied by greater equality of income in the Taiwan Province of China, Bangladesh and Egypt, for example, but by greater inequality in Chile, China and Poland. This suggests that the magnitude of the poverty-reduction payoff from growth depends, in part, on a country's specific circumstances and policies.

Is poverty reduction good for growth? Again, yes, in general. It is hard to think of countries where a large decrease in the absolute number of people living in poverty has not been accompanied by faster growth. Just as we can imagine growth occurring without any reduction of poverty, we can also imagine a strategy of poverty reduction that relies exclusively on redistributing wealth from the rich and the middle classes to the poor. In principle, a country pursuing redistributive policies could reduce poverty even if its total income did not grow. But we would be hard-pressed to find real-world examples. Policies that increase the incomes of the poor, such as investments in primary education, rural infrastructure, health and nutrition, tend to enhance the productive capacity of the whole economy, boosting the incomes of all groups.

What does a high correlation between growth and the incomes of the poor tell us? Practically nothing, for the reasons outlined above. All it shows is that income distribution tends to be stable and fairly unresponsive to policy changes. Moreover, a strong correlation between economic growth and poverty reduction is compatible with *both* of the following arguments: (1) only policies that target growth can reduce poverty; and (2) only policies that reduce poverty can boost overall economic growth. Therefore, the observed correlation between growth and poverty reduction is of little interest as far as policy choices and priorities are concerned.

The real question is (or ought to be) whether open trade policies are a reliable mechanism for generating self-sustaining growth and poverty reduction....

A somewhat different question is whether the well-being of the poor should enter as an independent determinant of policy choices, in addition to the usual focus on macroeconomic stability, microeconomic efficiency, and institutional quality. In other words, should economic reform strategies have a poverty focus?

Yes, for at least three reasons. First, in considering social welfare, most people in general, and most democratically elected governments in particular, would give more weight to the well-being of the poor than to that of the rich. An economy's growth rate is not a sufficient statistic for evaluating welfare because it ignores the distribution of the rewards of growth. A policy that increases the income of the poor by one rupee can be worthwhile at the margin even if it costs the rest of society more than a rupee. From this perspective, it may be entirely rational and proper for a government considering two competing growth strategies to choose the one that has greater potential payoff for the poor even if its impact on overall growth is less assured.

Second, even if the welfare of the poor does not receive extra weight, interventions aimed at helping the poor may still be the most effective way to raise average incomes. Poverty is naturally associated with market imperfections and incompleteness. The poor remain poor because they cannot borrow against future earnings to invest in education, skills, new crops and entrepreneurial activities. They are cut off from economic activity because they are deprived of many collective goods (e.g., property rights, public safety, infrastructure) and lack information about market opportunities. It is a standard tenet of economic theory that raising real average incomes requires interventions targeted at closing gaps between private and social costs. There will be a preponderance of such opportunities where there is a preponderance of poverty.

Third, focusing on poverty is also warranted from the perspective of an approach to development that goes beyond an exclusive focus on consumption or income levels to embrace human capabilities. As Amartya Sen (1999) has emphasized, the overarching goal of development is to maximize people's capabilities—that is, their ability to lead the kind of life they value. The poor face the greatest hurdles in this area and are therefore the most deserving of urgent policy attention.

Policy-makers make choices and determine priorities all the time. The lens through which they perceive development profoundly affects their choices. Keeping poverty in sight ensures that their priorities are not distorted. Consider some illustrative tradeoffs.

- **Fiscal policy.** How should a government resolve the trade-off between higher spending on poverty-related projects (rural infrastructure, say) and the need for tight fiscal policies? Should it risk incurring the disapproval of financial markets as the price of better irrigation? How should it allocate its educational budget? Should more be spent on building primary schools in rural areas or on training bank auditors and accountants?
- **Market liberalization.** Should the government maintain price controls on food crops, even if such controls distort resource allocation in the economy? Should it remove capital controls on the balance of payments, even if that means fiscal resources will be tied up in holding additional foreign reserves—resources that could otherwise have been used to finance a social fund?

- ***Institutional reform.*** How should the government design its anti-corruption strategy? Should it target the large-scale corruption that foreign investors complain about or the petty corruption in the police and judicial systems that affects ordinary citizens? Should legal reform focus on trade and foreign investment or domestic problems? Whose property rights should receive priority, peasants or foreign patent holders? Should the government pursue land reform, even if it threatens politically powerful groups?

As these examples illustrate, in practice, even the standard, growth-oriented desiderata of macroeconomic stability, microeconomic efficiency and institutional reform leave considerable room for manoeuvre. Governments can use this room to better or worse effect. A poverty focus helps ensure that the relevant trade-offs are considered explicitly.

Since growth and poverty reduction go largely hand in hand, the real questions are: What are the policies that yield these rewards? How much do we know about policy impacts? The honest answer is that we do not know nearly enough. We have evidence that land reforms, appropriately targeted price reforms and certain types of health and education expenditures benefit the poor, but we are uncertain about many things. It is one thing to say that development strategies should have a poverty focus, another to identify the relevant policies.

But this is not a strike against poverty-oriented programmes, since we are equally uncertain about growth-oriented programmes. The uncomfortable reality is that our knowledge about the kinds of policies that stimulate growth remains limited. We know that large fiscal and macroeconomic imbalances are bad for growth. We know that ‘good’ institutions are important, even though we have very little idea about how countries can acquire them. And, despite a voluminous literature on the subject, we know next to nothing about the kinds of trade policies that are most conducive to growth (see below).

For all of these reasons, it is not productive to make a sharp distinction between policies that promote growth and those that target the poor directly. These policies are likely to vary considerably depending on institutional context, making it difficult to generalize with any degree of precision. Our real focus should be on what works, how, and under what circumstances.

Achieving Economic Growth: What Really Matters?

The enlightened standard view of development policy grew out of dissatisfaction with the limited results yielded by the Washington Consensus policies of the 1980s and 1990s. The disappointing growth performance and increasing economic insecurity in Latin America—the region that went furthest with policies of privatization, liberalization and openness—the failures in the former Soviet Union, and the Asian financial crisis of 1997-98 all contributed to a refashioning, resulting in the ‘augmented Washington Consensus’ (shown in Table 1). This goes beyond liberalization and privatization to emphasize the need to create the institutional underpinnings of market economies. Reforms now include financial regulation and prudential supervision, governance and anti-corruption, legal and administrative reform, labour-market ‘flexibility’ and social safety nets.

Table 1

The Original Washington Consensus	The Augmented Washington Consensus
Fiscal discipline	<i>The original list plus:</i>
Reorientation of public expenditures	Legal/political reform
Tax reform	Regulatory institutions
Financial liberalization	Anti-corruption
Unified and competitive exchange rates	Labour market flexibility
Trade liberalization	WTO agreements
Openness to DFI	Financial codes and standards
Privatization	'Prudent' capital-account opening
Deregulation	Non-intermediate exchange rate regimes
Secure property rights	Social safety nets
	Poverty reduction

Operationally, these institutional reforms are heavily influenced by an Anglo-American conception of what constitutes desirable institutions (as in the preference for arms-length finance over 'development banking' and flexible labour markets over institutionalized labour markets). In addition, they are driven largely by the requirements of integration into the world economy: hence the emphasis on the international harmonization of regulatory practices, as in the case of financial codes and standards and of the WTO agreements.

Market economies rely on a wide array of non-market institutions that perform regulatory, stabilizing, and legitimizing functions (see Rodrik 2001a). Cross-national econometric work shows that the quality of a country's public institutions is a critical, and perhaps the most important, determinant of a country's long-term development (Acemoglu et al. 2000). While the recent emphasis on institutions is thus highly welcome, it needs to be borne in mind that the institutional basis for a market economy is not uniquely determined. There is no single mapping between a well-functioning market and the *form* of non-market institutions required to sustain it, as is clear from the wide variety of regulatory, stabilizing and legitimizing institutions in today's advanced industrial societies. The American style of capitalism is very different from the Japanese style of capitalism. Both differ from the European style. And even within Europe, there are large differences between the institutional arrangements in, say, Sweden and Germany. Over the long term, each of these have performed equally well.²

The point about institutional diversity has in fact a more fundamental implication. As Roberto Unger (1998) argues, the institutional arrangements in operation today, varied as they are, themselves constitute a subset of the full range of potential institutional possibilities. There is no reason to suppose that modern societies have exhausted

all useful institutional variations that could underpin healthy and vibrant economies. We must avoid thinking that a specific type of institution—mode of corporate governance, social security system or labour market legislation, for example—is the only one compatible with a well-functioning market economy.

Leaving aside the question of long-term choice over institutional forms, the enlightened standard view, insofar as it is presented as a recipe for stimulating economic growth, also suffers from a fatal flaw: it provides no sense of priorities among a long and highly demanding list of institutional prerequisites. This kitchen-sink approach to development strategy flies in the face of practical reality and is at odds with the historical experience of today's advanced industrial economies. What are today regarded as key institutional reforms in areas such as corporate governance, financial supervision, trade law and social safety nets did not take place in Europe or Northern America until quite late in the economic development process (Chang 2000). Indeed, many of the items on the augmented Washington Consensus agenda (Table 1) should be properly viewed as *outcomes* of successful economic development rather than its prerequisites.

The reality of growth transformations is that they are instigated by an initially narrow set of policy and institutional initiatives, which might be called 'investment strategies' (Rodrik 1999). Adequate human resources, public infrastructure, social peace and stability are all key enabling elements of an investment strategy. But often the critical factor is a set of targeted policy interventions that kindle the animal spirits of domestic investors. These investment strategies set off a period of economic growth, which in turn facilitates a cycle of institutional development and further growth. The initiating reforms are rarely replicas of each other, and they bear only partial resemblance to the requirements highlighted by the enlightened standard view. Typically, they entail a mix of orthodoxy with unconventional domestic innovations.

An analysis of three sets of investment strategies will elucidate this central point and highlight the different paths taken to greater prosperity: import-substitution, East-Asian-style outward orientation and two-track reform strategies. The list is not meant to be exhaustive, and in the future successful strategies are likely to differ from all three.

Import-Substituting Industrialization (ISI)

Import-substituting industrialization is based on the idea that domestic investment and technological capabilities can be spurred by providing home producers with (temporary) protection against imports. Although this approach has fallen into disgrace since the 1980s, it actually did quite well for a substantial period of time in scores of developing nations. Until the first oil shock hit in 1973, no fewer than 42 developing countries grew at rates exceeding 2.5 per cent per capita per annum (see Rodrik 1999: ch.4). At this rate, incomes would double every 28 years or less. Most of these countries followed ISI policies. The list includes 12 countries in South America, six in the Middle East and North Africa, and 15 in Sub-Saharan Africa. In fact, there were no less than six Sub-Saharan African countries among the 20 fastest-growing developing countries in the world prior to 1973: Swaziland, Botswana, Côte d'Ivoire, Lesotho, Gabon and Togo, with Kenya ranking 21st. There can be little doubt that economic growth led to substantial improvements in the living conditions of the vast majority of the house-

holds in these countries. Between 1967 and 1977, life expectancy at birth increased by four years in Brazil (from 58 to 62), by five years in Cote d'Ivoire (from 43 to 48), by five years in Mexico (from 60 to 65), and by five years in Pakistan (from 48 to 53). In Kenya, infant mortality fell from 112 (per 1,000 live births) in 1965 to 72 in 1980.

ISI policies spurred growth by creating protected and therefore profitable home markets for domestic entrepreneurs to invest in. Contrary to received wisdom, ISI-driven growth did not produce technological lags and inefficiency on an economy-wide scale. In fact, the productivity performance of many Latin American and Middle Eastern countries was, in comparative perspective, exemplary. According to estimates produced by Collins and Bosworth (1996), not only was average total factor productivity (TFP) growth during the period preceding the first oil shock quite high in the Middle East and Latin America (at 2.3 and 1.8%, respectively), it was actually significantly higher than in East Asia (1.3%)! Countries such as Brazil, the Dominican Republic and Ecuador in Latin America; Iran, Morocco and Tunisia in the Middle East; and Côte d'Ivoire and Kenya in Africa all experienced more rapid TFP growth than any of the East Asian countries in this early period (with the possible exception of Hong Kong, for which comparable data are not available). Mexico, Bolivia, Panama, Egypt, Algeria, Tanzania and Zaire experienced higher TFP growth than all but Taiwan. Of course, not all countries following ISI policies did well: Argentina is a striking counter-example, with an average TFP growth of only 0.2 per cent from 1960 to 1973.

The dismal reputation of ISI is due partly to the subsequent economic collapse experienced by many of the countries pursuing it in the 1980s, and partly to the extremely influential studies of Little, Scott and Scitovsky (1970) and Bela Balassa (1971). What these two studies did was to document in detail some of the *static* economic inefficiencies generated by high and extremely dispersed effective rates of protection (ERP) in the manufacturing sectors of the countries under study. The discovery of cases of negative value-added at world prices—that is, cases where countries would have been better off by throwing away the inputs than by processing them as they did in highly protected plants—was particularly shocking. However, neither study claimed to show that countries which had followed 'outward oriented' strategies had been systematically immune from the same kind of inefficiencies. In fact, their evidence can be read as suggesting that there was no such clear dividing line.³ In addition, the evidence on TFP growth reviewed above shows that the idea that ISI produced more dynamic inefficiency than did 'outward orientation' is simply incorrect.

Hence, as an industrialization strategy intended to raise domestic investment and enhance productivity, import substitution apparently worked pretty well in a very broad range of countries until at least the mid-1970s. However, starting in the second half of the 1970s, a disaster befell the vast majority of the economies that had been doing well. Of the 42 countries with growth rates above 2.5 per cent prior to 1973, less than a third (12) managed the same record over the next decade. The Middle East and Latin America, which had led the developing world in TFP growth prior to 1973, not only fell behind, but actually began to experience *negative* TFP growth on average. Only East Asia held its own, while South Asia actually improved its performance (see Collins and Bosworth 1996).

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Was this a result of the ‘exhaustion’ of import-substitution policies? As I have argued elsewhere (Rodrik 1999), the common timing implicates the turbulence experienced in the world economy following 1973—the abandonment of the Bretton Woods system of fixed exchange rates, two major oil shocks, various other commodity boom-and-bust cycles, plus the U.S. Federal Reserve interest-rate shock of the early 1980s. The fact that some of the most ardent followers of ISI policies in South Asia—especially India and Pakistan—managed to either hold on to their growth rates after 1973 (Pakistan) or increase them (India) also suggests that more than just ISI was involved.⁴

The actual story implicates macroeconomic policies rather than the trade regime. The proximate reason for the economic collapse was the inability to adjust macroeconomic policies appropriately in the wake of these external shocks. Macroeconomic maladjustment gave rise to a range of syndromes associated with macroeconomic instability—high or repressed inflation, scarcity of foreign exchange and large black-market premiums, external payments imbalances and debt crises—which greatly magnified the real costs of the shocks. Countries that suffered the most were those with the largest increases in inflation and black-market premiums for foreign currency. The culprits were poor monetary and fiscal policies and inadequate adjustments in exchange-rate policy, sometimes aggravated by shortsighted policies of creditors and the Bretton Woods institutions. The bottom line is that in those countries that experienced a debt crisis, the crisis was the product of monetary and fiscal policies that were incompatible with sustainable external balances: there was too little expenditure reducing and expenditure switching. Trade and industrial policies had very little to do with bringing on the crisis.

Why were some countries quicker to adjust their macroeconomic policies than others? The real determinants of growth performance after the 1970s are rooted in the ability of domestic institutions to manage the distributional conflicts triggered by the external shocks of the period. Social conflicts and their management—whether successful or not—played a key role in transmitting the effects of external shocks on to economic performance. Societies with deep social cleavages and poor institutions of conflict management proved worse at handling shocks (see Rodrik 1999).

‘Outward-Oriented’ Industrialization

The experience of the East Asian tigers is often presented as one of export-led growth, in which opening up to the world economy unleashed powerful forces of industrial diversification and technological catch-up. However, the conventional account overlooks the active role taken by the governments of Taiwan Province of China and the Republic of Korea (and Japan before them) in shaping the allocation of resources. In neither of these countries was there significant import liberalization early in the process of growth. Most of their trade liberalization took place in the 1980s, when high growth was already firmly established.

The key to these and other East Asian countries’ success was a coherent strategy of raising the return to private investment, through a range of policies that included credit subsidies and tax incentives, educational policies, establishment of public enterprises, export inducements, duty-free access to inputs and capital goods and actual govern-

ment coordination of investment plans. In the Republic of Korea, the chief form of investment subsidy was the extension of credit to large business groups at negative real interest rates. Korean banks were nationalized after the military coup of 1961, and consequently the government obtained exclusive control over the allocation of investible funds in the economy. Another important manner in which investment was subsidized in Korea was through the socialization of investment risk in selected sectors. This emerged because the government—most notably President Park—provided an implicit guarantee that the state would bail out entrepreneurs investing in ‘desirable’ activities if circumstances later threatened the profitability of those investments. In Taiwan, investment subsidies took the form of tax incentives.

In both the Republic of Korea and Taiwan, public enterprises played a very important role in enhancing the profitability of private investment by ensuring that key inputs were available locally for private producers downstream. Not only did public enterprises account for a large share of manufacturing output and investment in each country, their importance actually increased during the critical take-off years of the 1960s. Singapore also heavily subsidized investment, but this country differs from the Republic of Korea and Taiwan in that its investment incentives centred heavily on foreign investors.

While trade policies that spurred exports were part of this complex arsenal of incentives, investment and its promotion was the key goal in all countries. To that end, governments in the Republic of Korea and Taiwan freely resorted to unorthodox strategies: they protected the home markets to raise profits, implemented generous export subsidies, encouraged their firms to reverse-engineer foreign patented products, and imposed performance requirements such as export-import balance requirements and domestic content requirements on foreign investors (when foreign companies were allowed in). All of these strategies are now severely restricted under the WTO agreements.

The Two-Track Strategy

A relatively minimal set of reforms in China in the late 1970s set the stage for the phenomenal economic performance that has been the envy of any poor country since. Initial reforms were relatively simple: they loosened the communal farming system and allowed farmers to sell their crops in free markets once they had fulfilled their quota obligations to the state. Subsequent reforms allowed the creation of township and village enterprises and the extension of the ‘market track’ into the urban and industrial sectors. Special economic zones were created to attract foreign investment. What stands out about these reforms is that they are based on dual tracks (state and market), on gradualism and on experimentation.

One can interpret Chinese-style gradualism in two ways. One perspective, represented forcefully in work by Sachs and Woo (2000) underplays the relevance of Chinese particularism by arguing that the successes of the economy are not due to any special aspects of the Chinese transition to a market economy, but instead are largely due to a *convergence* of Chinese institutions with those in non-socialist economies. In this view, the faster the convergence, the better the outcomes: ‘favorable outcomes have

emerged not because of gradualism, but *despite* gradualism' (ibid:3). The policy message that follows is that countries that look to China for lessons should focus not on institutional experimentation but on harmonizing their institutions with those abroad.

The alternative perspective, perhaps best developed in work by Qian and Roland, is that the peculiarities of the Chinese model represent solutions to particular political or informational problems for which no blueprint-style solution exists. Hence Lau, Qian and Roland (1997) interpret the dual-track approach to liberalization as a way of implementing Pareto-efficient reforms: an alteration in the planned economy that improves incentives at the margin, enhances efficiency in resource allocation, and yet leaves none of the plan beneficiaries worse off. Qian, Roland and Xu (1999) interpret Chinese-style decentralization as allowing the development of superior institutions of coordination: when economic activity requires products with matched attributes, local experimentation is a more effective way of processing and using local knowledge. These analysts find much to praise in the Chinese model because they think the system generates the right incentives for developing the tacit knowledge required to build and sustain a market economy, and therefore they are not overly bothered by some of the economic inefficiencies that may be generated along the way.

A less well-known instance of a successful two-track strategy is that of Mauritius, where superior economic performance has been built on a peculiar combination of orthodox and heterodox strategies. An export processing zone (EPZ), operating under free-trade principles, enabled an export boom in garments to European markets and an accompanying investment boom at home. Yet the island's economy has combined the EPZ with a domestic sector that was highly protected until the mid-1980s: the IMF gave the Mauritian economy the highest (i.e., worst) score on its 'policy restrictiveness' index for the early 1990s, reckoning it was one of the world most protected economies even by the late 1990s (see Subramanian 2001). Mauritius is essentially an example of an economy that has followed a two-track strategy not too dissimilar to that followed by China, but which was underpinned by social and political arrangements that encouraged participation, representation and coalition-building.

The circumstances under which the Mauritian EPZ was set up in 1970 are instructive, and highlight the manner in which participatory political systems help design creative strategies for building locally adapted institutions. Given the small size of the home market, it was evident that Mauritius would benefit from an outward-oriented strategy. But as in other developing countries, policy-makers had to contend with the import-substituting industrialists who had been propped up by the restrictive commercial policies of the early 1960s prior to independence, and who were naturally opposed to relaxing the trade regime.

A Washington economist would have advocated across-the-board liberalization, without regard to what that might do the precarious ethnic and political balance of the island. The EPZ scheme provided a neat way around the political difficulties. The creation of the EPZ generated new opportunities of trade and of employment,

without taking protection away from the import-substituting groups and from the male workers who dominated the established industries. The segmentation of labour markets early on between male and female workers—with the latter predominantly employed in the EPZ—was particularly crucial, as it prevented the expansion of the EPZ from driving wages up in the rest of the economy, thereby disadvantaging import-substituting industries. New employment and profit opportunities were created at the margin, while leaving old opportunities undisturbed. This in turn paved the way for the more substantial liberalizations that took place in the mid-1980s and in the 1990s. By the 1990s, the female-male earning ratio was higher in the EPZ than in the rest of the economy (ILO 2001, table 28). Mauritius found its own way to economic development because it was able to devise a strategy that was unorthodox, yet effective.

The Bottom Line

These examples suggest that while market incentives, macroeconomic stability and sound institutions are critical to economic development, they can be generated in a number of different ways—by making the best use of existing capabilities in light of resource and other constraints. There is no single model of a successful transition to a high-growth path. Each country has to figure out its own investment strategy. Once the appropriate strategy is identified (or stumbled upon), the institutional reforms needed may not be extensive. Most of the institutional development occurs alongside economic development, not as a prerequisite to it.

Trade Liberalization, Growth and Poverty Reduction: What Do the Facts Really Show?

Consider two countries, A and B. Country A engages in state trading, maintains import monopolies, retains quantitative restrictions and high tariffs (in the range of 30–50 per cent) on imports of agricultural and industrial products and is not a member of the WTO. Country B, a WTO member, has slashed import tariffs to a maximum of 15 per cent and removed all quantitative restrictions, earning a rare commendation from the U.S. State Department that ‘there are few significant barriers to U.S. exports’ (US State Department 1999). One of the two economies has experienced GDP growth rates in excess of 8 per cent per annum, has sharply reduced poverty, has expanded trade at double-digit rates, and has attracted large amounts of foreign investment. The other economy has stagnated and suffered deteriorating social indicators, and has made little progress in integrating with the world economy as judged by trade and foreign investment flows.

Country A is Viet Nam, which since the mid-1980s has followed Chinese-style gradualism and a two-track reform programme. Country B is Haiti. Viet Nam has been phenomenally successful, achieving not only high growth and poverty reduction, but also a rapid pace of integration into the world economy despite high barriers to trade. Haiti’s economy has gone nowhere, even though the country undertook a comprehensive trade liberalization in 1994–95.

The contrasting experiences of these two countries highlight two important points. First, a leadership committed to development and standing behind a coherent growth

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strategy counts for a lot more than trade liberalization, even when the strategy departs sharply from the enlightened standard view on reform. Second, integration with the world economy is an outcome, not a prerequisite, of a successful growth strategy. Protected Viet Nam is integrating with the world economy significantly more rapidly than is open Haiti, because Viet Nam is growing and Haiti is not.

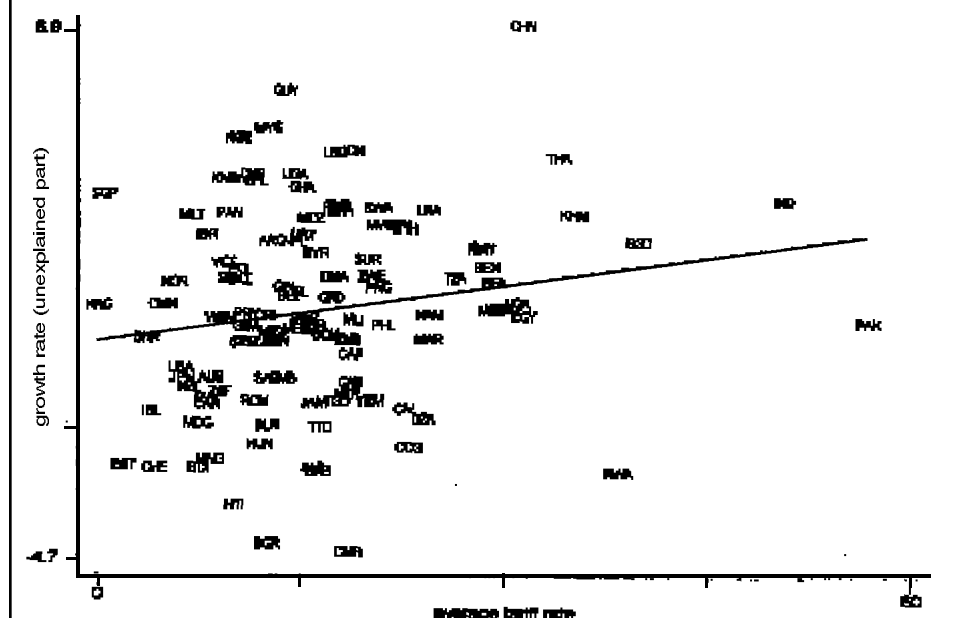
This comparison illustrates a common misdiagnosis. A typical World Bank exercise consists of classifying developing countries into ‘globalizers’ and ‘non-globalizers’ based on their rates of growth of trade volumes. The analyst asks whether globalizers (i.e., those with the highest rates of trade growth) have experienced faster income growth, greater poverty reduction and worsened income distribution (see Dollar and Kraay 2000). The answers tends to be yes, yes, and no. As the Viet Nam and Haiti cases show, however, this is a highly misleading exercise. Trade volumes are the outcome of many different things, including most importantly an economy’s overall performance. They are not something that governments control directly. What governments control are trade *policies*: the level of tariff and non-tariff barriers, membership in the WTO, compliance with its agreements and so on. The relevant question is: Do open trade *policies* reliably produce higher economic growth and greater poverty reduction?

Cross-national comparison of the literature reveals no systematic relationship between a country’s average level of tariff and non-tariff restrictions and its subsequent economic growth rate. If anything, the evidence for the 1990s indicates a *positive* (but statistically insignificant) relationship between tariffs and economic growth (see Figure 1). The only systematic relationship is that countries dismantle trade restrictions as they get richer. That accounts for the fact that today’s rich countries, with few exceptions, embarked on modern economic growth behind protective barriers, but now have low trade barriers.

The absence of a robust positive relationship between open trade policies and economic growth may come as a surprise in view of the ubiquitous claim that trade liberalization promotes higher growth. Indeed, the literature is replete with cross-national studies concluding that growth and economic dynamism are strongly linked to more liberal trade policies. For example, an influential study by Sachs and Warner (1995) found that economies that are open, by their definition, grew 2.4 percentage points faster annually than did those that are not—an enormous difference. Without such studies, organizations such as the World Bank, IMF and the WTO could not have been so vociferous in their promotion of trade-centric development strategies.

Upon closer look, however, these studies turn out to be flawed. The classification of countries as ‘open’ or ‘closed’ in the Sachs-Warner study, for example, is not based on actual trade policies but largely on indicators related to exchange rate policy and location in Sub-Saharan Africa. Their classification of countries in effect conflates macroeconomics, geography and institutions with trade policy. It is so correlated with plausible groupings of alternative explanatory variables—macroeconomic instability, poor institutions, location in Africa—that one cannot draw from the subsequent empirical analysis any strong inferences about the effects of openness on growth (see Rodriguez and Rodrik 2001).

The problem is a general one. In a review of the best-known literature (Dollar 1992; Ben-David 1993; Edwards 1998; Frankel and Romer 1999; Sachs and Warner

Figure 1**Low import tariffs are good for growth? Think again**

Source: All data are averages for the 1990s, and come from the Dollar and Kraay (2000) data set. Specifications are based on Dollar and Kraay (2000), replacing trade/GDP with tariff levels and controlling separately for initial income, government consumption/GDP and inflation rate.

1995), Francisco Rodriguez and I found a major gap between the policy conclusions that are typically drawn and what the research has actually shown. A common problem has been the misattribution of macroeconomic phenomena (e.g., overvalued currencies or macroeconomic instability) or geographic location (e.g., in the tropical zone) to trade policies. Once these problems are corrected, any meaningful relationship across countries between the level of trade barriers and economic growth evaporates (see also Helleiner 1994).

In practice, the relationship between trade openness and growth is likely to be a contingent one, dependent on a host of internal and external characteristics. The fact that practically all of today's advanced countries embarked on their growth behind tariff barriers, and reduced protection only subsequently, surely offers a clue of sorts. Moreover, the modern theory of endogenous growth yields an ambiguous answer to the question of whether trade liberalization promotes growth, one that depends on whether the forces of comparative advantage push the economy's resources towards activities that generate long-run growth (research and development, expanding product variety, upgrading product quality, etc.) or divert them from such activities.

No country has developed successfully by turning its back on international trade and long-term capital flows. Very few countries have grown over long periods of time without experiencing an increase in the share of foreign trade in their national product. In practice, the most compelling mechanism that links trade with growth in developing countries is that imported capital goods are likely to be significantly cheaper than those manufactured at home. Policies that restrict imports of capital

equipment, raise the price of capital goods at home and thereby reduce real investment levels have to be viewed as undesirable on the face of it – although this does not rule out the possibility of selective infant industry policies in certain segments of capital-goods industries. Exports, in turn, are important since they permit the purchase of imported capital equipment.

But it is equally true that no country has developed simply by opening itself up to foreign trade and investment. The trick has been to combine the opportunities offered by world markets with a domestic investment and institution-building strategy to stimulate the animal spirits of domestic entrepreneurs. Almost all of the outstanding cases—East Asia, China, India since the early 1980s—involve partial and gradual opening up to imports and foreign investment.

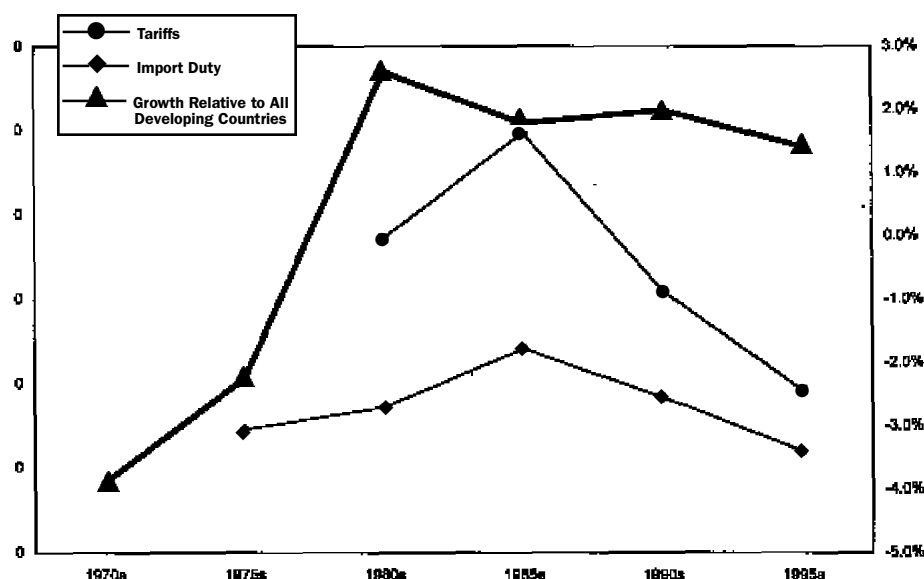
The experiences of China and India are particularly noteworthy, as they are two huge countries that have done extremely well recently, and are often cited as examples of what openness can achieve (see Stern 2000:3). The reality, once again, is more complicated. In both India and China, the main trade reforms took place about a decade *after* the onset of higher growth. Moreover, these countries' trade restrictions remain among the highest in the world. As noted briefly above, the increase in China's growth started in the late 1970s with the introduction of the household responsibility system in agriculture and of two-tier pricing. Trade liberalization did not start in earnest until much later, during the second half of the 1980s and especially during the 1990s, once the trend growth rate had already increased substantially.

The case of India is shown in Figure 2. As the figure makes clear, India's trend growth rate increased substantially in the early 1980s (a fact that stands out particularly clearly when it is compared against other developing countries), while serious trade reform did not start until 1991-93. The tariff averages displayed in the chart show that tariffs were actually higher in the rising growth period of the 1980s than in the low-growth 1970s. To be sure, tariffs hardly constitute the most serious trade restrictions in India, but they nonetheless display the trends in Indian trade policy fairly accurately.

Of course, both India and China did 'participate in international trade,' and by that measure they are both globalizers. But the relevant question for policy-makers is not whether trade per se is good or bad—countries that do well also increase their trade/GDP ratios as a by-product—but what the correct sequence of policies is and how much priority deep trade liberalization should receive early in the reform process. With regard to the latter questions, the experiences of India and China are suggestive of the benefits of a gradual, sequenced approach.

To repeat, the appropriate conclusion is not that trade protection is inherently preferable to trade liberalization; certainly, there is scant evidence from the last 50 years that inward-looking economies experience systematically faster economic growth than open ones. But the benefits of trade openness are now greatly oversold. Deep trade liberalization cannot be relied on to deliver high rates of economic growth and therefore does not deserve the high priority it typically receives in the development strategies pushed by leading multilateral organizations.⁵

As Helleiner (2000: 3) puts it, there are 'few reputable developing country analysts or governments who question the positive potential roles of international trade or

Figure 2**Tariffs and Growth in India**

Source: Author's calculations from data in Dollar and Kraay (2000) and World Bank, *World Development Indicators 2000*, CD-Rom.

capital inflow in economic growth and overall development. How *could* they question the inevitable need for participation in, indeed a considerable degree of integration with, the global economy?' The real debate is not over whether integration is good or bad, but over matters of policy and priorities: 'It isn't at all obvious *either* (1) that further external liberalization ('openness') is now in every country's interest and in all dimensions *or* (2) that in the overarching sweep of global economic history what the world now *most* requires is a set of global rules that promote or ease the path to greater freedom for global market actors, and are universal in application' (ibid: 4).

The Integrationist Agenda and the Crowding Out of Development Priorities

Priorities are important because in the enlightened standard view, insertion into the world economy is no longer a matter of simply removing trade and investment barriers. Countries have to satisfy a long list of institutional requirements in order to maximize the gains and minimize the risks of participation in the world economy. Global integration remains the key prerequisite for economic development, but there is now a lot more to it than just throwing the borders open. Reaping the gains from openness requires a full complement of institutional reforms.

So trade liberalization entails not only the lowering of tariff and non-tariff barriers, but also compliance with WTO requirements on subsidies, intellectual property, customs procedures, sanitary standards and policies vis-à-vis foreign investors. Moreover, these legal requirements have to be complemented with additional reforms to ensure favourable economic outcomes: tax reform to make up for lost tariff revenues; social safety nets to compensate displaced workers; credibility enhancing

institutional innovations to quell doubts about the permanence of the reforms; labour-market reform to enhance labour mobility across industries; technological assistance to upgrade firms adversely affected by import competition; training programmes to ensure that export-oriented firms and investors have access to skilled workers; and so on. Reading World Bank reports on trade policy, one can be excused for thinking that the list of complementary reforms is virtually endless.

Notwithstanding the overly Anglo-American conception of institutional possibilities reflected in the Washington agenda for integrationist reform, many of the proposed institutional reforms are perfectly sensible ones, and in a world without financial, administrative or political constraints, there would be little argument about the need to adopt them. But in the real world, fiscal resources, administrative capabilities and political capital are all scarce, and choices need to be made about how to deploy them. In such a world, viewing institutional priorities from the vantage point of insertion in the global economy has real opportunity costs.

Some trade-offs are illustrative. It has been estimated that it costs a typical developing country \$150 million to implement requirements under just three of the WTO agreements: customs valuation, sanitary and phytosanitary measures (SPS) and intellectual property rights (TRIPS). As the World Bank's Michael Finger points out, this is a sum equal to a year's development budget for many of the least-developed countries (Finger and Schuler 1999).

In the area of legal reform, should the government focus its energies on 'importing' legal codes and standards, or on improving existing domestic legal institutions? In Turkey, a weak coalition government spent several months gathering political support for a bill that would provide foreign investors the protection of international arbitration. Wouldn't it have been a better strategy for the long run to reform the existing legal regime for the benefit of foreign *and* domestic investors alike?

In public health, should the government pursue tough policies on compulsory licensing and/or parallel importation of basic medicines, even if that means running afoul of existing WTO rules? The United States has charged that Brazil's highly successful treatment programme for HIV/AIDS violates WTO rules because it allows the government to seek compulsory licensing when a foreign patent holder does not 'work' the patent locally.

In industrial strategy, should the government simply open up and let the chips drop wherever they might, or should it emulate East Asian experience of industrial policies through export subsidies, directed credit and selective protection?

How should the government focus its anti-corruption strategy? Should it target the 'grand' corruption that foreign investors complain about, or the petty corruption that affects the poor the most? Perhaps, as proponents of permanent normal trade relations with China argued in the recent U.S. Congressional debate, a government that is forced to protect the rights of foreign investors becomes more inclined to protect the human rights of its own citizens too. But isn't this at best a trickle-down strategy of institutional reform? Shouldn't institutional reform be targeted on the desired ends directly—whether those ends are the rule of law, improved observance of human rights or reduced corruption?

The rules for admission into the world economy not only reflect little awareness of development priorities, they are often completely unrelated to sensible economic principles. WTO rules on anti-dumping, subsidies and countervailing measures, agriculture, textiles, trade related investment measures (TRIMS) and trade related intellectual property rights (TRIPS) are utterly devoid of any economic rationale beyond the mercantilist interests of a narrow set of powerful groups in the advanced industrial countries. The developmental pay-off of most of these requirements is hard to see.

Bilateral and regional trade agreements are often far worse, as they impose even tighter prerequisites on developing countries in return for crumbs of enhanced 'market access' in the larger partners. The Africa Growth and Opportunity Act passed by the U.S. Congress in 2000, for example, contains a long list of eligibility criteria, including the requirement that African governments minimize interference in the economy. It provides free access to U.S. markets only under strict rules of origin, thereby ensuring that few economic linkages are generated in the African countries themselves. The U.S.-Jordan Free Trade Agreement imposes more restrictive intellectual property rules on Jordan than exist under the WTO.

In each of these areas, a strategy focused on integration crowds out more development-friendly alternatives. Many of the institutional reforms needed for insertion in the world economy can be independently desirable, or produce broader spillovers. But these priorities do not necessarily coincide with the priorities of a broader development agenda. A strategy that focuses on getting the state out of the way of the market overlooks the important functions that the state must play during the process of economic transformation. What belongs on the agenda of institutional reform is building up state capacity—not diminishing it (Evans 2000).

World markets are a source of technology and capital; it would be silly for the developing world not to exploit these opportunities. But, as I have argued above, successful development strategies have always required a judicious blend of imported practices with domestic institutional innovations. Policy-makers need to forge a *domestic* growth strategy, relying on domestic investors and domestic institutions. The most costly downside of the integrationist agenda is that it is crowding out serious thinking and efforts along such lines.

An International Trade Regime That Puts Development First: General Principles

Access to the markets of the industrial countries matters for development. But so does the autonomy to experiment with institutional innovations that diverge from orthodoxy. The exchange of reduced policy autonomy in the South for improved market access in the North is a bad bargain where development is concerned.

Consider the old GATT system, under which the international trade regime did not reach much beyond tariff and non-tariff barriers to trade. The developing countries were effectively exempt from prevailing disciplines. The 'most favoured nation' principle ensured that they benefited from the tariff cuts negotiated among the industrial countries, while they themselves 'gave up' little in return. The resulting pattern of liberalization may have been asymmetric (with many products of interest to developing

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countries either excluded or receiving less beneficial treatment), but the net effect for the developing world was still highly salutary.

It is in such an environment that the most successful 'globalizers' of an earlier era—the East Asian tigers—managed to prosper. These countries were free to do their own thing, and did so, combining trade reliance with unorthodox policies—export subsidies, domestic-content requirements, import-export linkages, patent and copyright infringements, restrictions on capital flows (including direct foreign investment), directed credit and so on—that are largely precluded by today's rules.⁶ In fact, such policies were part of the arsenal of today's advanced industrial countries until quite recently (see Scherer and Watal 2001). The environment for today's globalizers is significantly more restrictive (see Amsden 2000).

For the world's poorest economies, the so-called least developed countries (LLDCs), something along the old GATT lines is still achievable, and would constitute a more development-friendly regime than the one that exists currently. LLDCs are economies that are individually and collectively small enough that 'adjustment' issues in the advanced countries are not a serious obstacle to the provision of one-sided free-market access in the North to the vast majority of products of interest to them. Instead of encumbering these countries with all kinds of institutional requirements that come attached to a 'single undertaking,' it would be far better to leave them the room to follow their own institutional priorities, while providing them with access into northern markets that is both duty free and free of quantitative restrictions. In practice, this can be done either by extending existing 'phase-in' periods until certain income thresholds are reached, or incorporating a general LLDC exception.

In the case of middle-income and other developing nations, it is unrealistic to expect that advanced industrial countries would be willing to accept a similar arrangement. The amount of political opposition that imports from developing countries generate in the advanced industrial countries is already disproportionate to the volume of trade in question. Some of these objectives have a legitimate core, and it is important that developing nations understand and accept this (see Mayda and Rodrik 2001). Under a sensible set of global trade rules, industrialized countries would have as much right to protect their own social arrangements—in areas such as labour and environmental standards, welfare-state arrangements, rural communities, or industrial organization—as developing nations have to adopt divergent institutional practices. Countries such as India, Brazil, or China, whose exports can have a sizable impact on, say, labour-market institutions and employment relations within the advanced countries, cannot ask importing countries to overlook these effects while demanding at the same time that the constraints on their own developmental agenda be lifted. Middle-income developing countries have to accept a more balanced set of rights and obligations

Is it possible to preserve developing countries' autonomy while also respecting the legitimate objectives of advanced industrial countries to maintain high labour, social and environmental standards at home? Would such a regime of world trade avoid collapsing into protectionism, bilateralism or regional trade blocs? Would it in fact be development-friendly? The answer to all these questions is yes, provided we accept five simple principles.

Trade is a means to an end, not an end in itself. Step number one is to move away from attaching normative significance to trade itself. The scope of market access generated by the international trade regime and the volume of trade thereby stimulated are poor measures of how well the system functions. As the WTO's preamble emphasizes, trade is useful only insofar as it serves broader developmental and social goals. Developing countries should not be obsessed with market access abroad, at the cost of overlooking more fundamental developmental challenges at home. Industrial countries should balance the interests of their exporters and multinational companies with those of their workers and consumers.

Advocates of globalization lecture the rest of the world incessantly about the adjustments countries have to undertake in their policies and institutions in order to expand their international trade and become more attractive to foreign investors. This is another instance of confusing means for ends. Trade serves at best as an instrument for achieving the goals that societies seek: prosperity, stability, freedom and quality of life. Nothing enrages WTO bashers more than the suspicion that, when push comes to shove, the WTO allows trade to trump the environment or human rights. And developing countries are right to resist a system that evaluates their needs from the perspective of expanding world trade instead of poverty reduction.

Reversing our priorities would have a simple but powerful implication. Instead of asking what kind of multilateral trading system maximizes foreign trade and investment opportunities, we would ask what kind of multilateral system best enables nations around the world to pursue their own values and developmental objectives.

Trade rules have to allow for diversity in national institutions and standards. As I have emphasized above, there is no single recipe for economic advancement. This does not mean that anything and everything works: market-based incentives, clear property-control rights, competition and macroeconomic stability are essential everywhere. But even these universal requirements can be and have been embodied in diverse institutional forms. Investment strategies, needed to jump-start economies, can also take different forms.

Moreover, citizens of different countries have varying preferences over the role of government regulations or provision of social welfare, however imperfectly these preferences are articulated or determined. They differ over the nature and extent of regulations to govern new technologies (such things as genetically modified organisms) or protect the environment, of policies to extend social safety nets and, more broadly, about the entire relationship between efficiency and equity. Rich and poor nations have very different needs in the areas of labour standards or patent protection. Poor countries need the space to follow developmental policies that richer countries no longer require. When countries use the trade system to impose their institutional preferences on others, the result is erosion of the system's legitimacy and efficacy. Trade rules should seek peaceful co-existence among national practices, not harmonization.

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Non-democratic countries cannot count on the same trade privileges as democratic ones.

National standards that deviate from those in trade partners and thereby provide 'trade advantages' are legitimate only to the extent that they are grounded in free choices made by citizens. Think of labour and environmental standards, for example. Poor countries argue that they cannot afford to have the same stringent standards in these areas as the advanced countries. Indeed, tough emission standards or regulations against the use of child labour can easily backfire if they lead to fewer jobs and greater poverty. Democratic countries such as India and Brazil can legitimately argue that their practices are consistent with the wishes of their own citizens, and that therefore it is inappropriate for labour groups or NGOs in advanced countries to tell them what standard they should have. Of course, democracy never works perfectly (in either developing countries or in advanced countries), and one would not want to argue that there are no human rights abuses in the countries just mentioned. The point is simply that the presence of civil liberties and political freedoms provides a presumptive cover against the charge that labour, environmental and other standards in the developing nations are inappropriately low.

But in non-democratic countries, such as China, the assertion that labour rights and the environment are trampled for the benefit of commercial advantage cannot be as easily dismissed. Consequently, exports of non-democratic countries deserve greater scrutiny when they entail costly dislocations or adverse distributional consequences in importing countries. In the absence of the presumptive cover provided by democratic rights, such countries need to make a 'developmental' case for policies that generate adjustment difficulties in the importing countries. For example, minimum wages that are significantly lower than in rich countries or health and other benefits that are less generous can be justified by pointing to lower labour productivity and living standards in poor nations. Lax child labour regulations can sometimes be justified by the argument that under conditions of widespread poverty it is not feasible or desirable to withdraw young workers from the labour force. In other cases, the 'affordability' argument carries less weight: non-discrimination, freedom of association, collective bargaining, prohibition of forced labour do not 'cost' anything; compliance with these 'core labour rights' does not harm, and indeed possibly benefits, economic development. The latter are examples that do not pass the 'development test.'

Countries have the right to protect their own institutions and development priorities.

Opponents of today's trade regime argue that trade sets off a 'race to the bottom,' with nations converging towards the lowest levels of environmental, labour and consumer protections. Advocates counter that there is little evidence that trade leads to the erosion of national standards. Developing nations complain that current trade laws are too intrusive, and leave little room for development-friendly policies. Advocates of the WTO reply that these rules provide useful discipline to rein in harmful policies that would otherwise end up wasting resources and hampering development.

One way to cut through this impasse is to accept that countries can uphold national standards and policies in these areas, by withholding market access or suspending WTO obligations if necessary, when trade demonstrably undermines domestic practices that

enjoy broad popular support. For example, poor nations might be allowed to subsidize industrial activities (and indirectly, their exports) when this is part of a broadly supported development strategy aimed at stimulating technological capabilities. Advanced countries might seek temporary protection against imports originating from countries with weak enforcement of labour rights when such imports serve to worsen working conditions at home. The WTO already has a ‘safeguard’ system in place to protect firms from import surges. An extension of this principle to protect developmental priorities or environmental, labour and consumer-safety standards at home—with appropriate procedural restraints against abuse—might make the world trading system more development-friendly, more resilient and less resistant to ad-hoc protectionism.

Currently, the Agreement on Safeguards allows (temporary) increases in trade restrictions under a very narrow set of conditions (see Rodrik 1997). It requires a determination that *increased* imports ‘cause or threaten to cause serious injury to the domestic industry,’ that causality be firmly established and that if there are multiple causes, injury not be attributed to imports. Safeguards cannot be applied to developing-country exporters unless their share of imports of the product concerned is above a threshold. A country applying safeguard measures has to compensate the affected exporters by providing ‘equivalent concessions,’ lacking which the exporter is free to retaliate.

A broader interpretation of safeguards would acknowledge that countries may legitimately seek to restrict trade or suspend existing WTO obligations—to exercise what I call ‘opt-outs’—for reasons going beyond competitive threats to their industries. Among such reasons are, as I have discussed, developmental priorities as well as distributional concerns or conflicts with domestic norms or social arrangements in the industrial countries. We could imagine recasting the current agreement into an Agreement on Developmental and Social Safeguards, which would permit the application of opt-outs under a broader range of circumstances. This would require recasting the ‘serious injury’ test and replacing it with the need to demonstrate broad domestic support, *among all concerned parties*, for the proposed measure.

To see how that might work in practice, consider what the current agreement says:

A Member may apply a safeguard measure only following an investigation by the competent authorities of that Member pursuant to procedures previously established and made public in consonance with Article X of the GATT 1994. This investigation shall include reasonable public notice to all interested parties and public hearings or other appropriate means in which *importers, exporters and other interested parties could present evidence and their views*, including the opportunity to respond to the presentations of other parties and to submit their views, inter alia, as to *whether or not the application of a safeguard measure would be in the public interest*. The competent authorities shall publish a report setting forth their findings and reasoned conclusions reached on all pertinent issues of fact and law. (WTO 1995:9; emphasis added)

The main shortcoming of this clause is that while it allows all relevant groups,

An automatic sunset clause could ensure that trade restrictions and opt-outs do not become entrenched long after their perceived need has disappeared.

and exporters and importers in particular, to make their views known, it does not actually compel them to do so. Consequently, it results in a strong bias in the domestic investigative process towards the interests of import-competing groups, who are the petitioners for import relief and its obvious beneficiaries. Indeed, this is a key problem with hearings in anti-dumping proceedings, where testimony from other groups besides the import-competing industry is typically not allowed.

The most significant and reliable guarantee against the abuse of opt-outs is informed deliberation at the national level. A critical reform, then, would be to require the investigative process in each country to: (1) gather testimony and views from all relevant parties, including consumer and public-interest groups, importers and exporters, civil society organizations, and (2) determine whether there exists *sufficiently broad support* among these groups for the exercise of the opt-out or safeguard in question. The requirements that groups whose incomes might be adversely affected by the opt-out—importers and exporters—be compelled to testify, and that the investigative body trade off the competing interests in a transparent manner would help ensure that protectionist measures that benefit a small segment of industry at a large cost to society would not have much chance of success. When the opt-out in question is part of a broader development strategy that has already been adopted after broad debate and participation, an additional investigative process need not be launched. This last point deserves to be highlighted in view of the emphasis placed on ‘local ownership’ and ‘participatory mechanisms’ in strategies of poverty reduction and growth promoted by the international financial institutions.

The main advantage of this procedure is that it would force a public debate on the legitimacy of trade rules and when to suspend them, ensuring that all sides would be heard. This is something that rarely happens even in the industrial countries, let alone in developing nations. This procedure could be complemented with a strengthened monitoring and surveillance role for the WTO, to ensure that domestic opt-out procedures are in compliance with the expanded safeguard clause. An automatic sunset clause could ensure that trade restrictions and opt-outs do not become entrenched long after their perceived need has disappeared.

Allowing opt-outs in this manner would not be without its risks. The possibility that the new procedures would be abused for protectionist ends and open the door to unilateral action on a broad front, despite the high threshold envisaged here, has to be taken into account. But as I have already argued, the current arrangements also have risks. The ‘more of the same’ approach embodied in the industrialized countries’ efforts to launch a comprehensive new round of trade negotiations is unlikely to produce benefits for developing nations. Absent creative thinking and novel institutional designs, the narrowing of the room for institutional divergence harms development prospects. It may also lead to the emergence of a new set of ‘grey area’ measures entirely outside multilateral discipline. These are consequences that are far worse than the expanded safeguard regime I have just described.

But countries do not have the right to impose their institutional preferences on others. The exercise of opt-outs to uphold a country’s own priorities has to be sharply dis-

tinguished from using them to impose these priorities on other countries. Trade rules should not force Americans to consume shrimp that are caught in ways that most Americans find unacceptable; but neither should they allow the United States to use trade sanctions to alter the way that foreign nations go about their fishing business. Citizens of rich countries who are genuinely concerned about the state of the environment or of workers in the developing world can be more effective through channels other than trade—via diplomacy or foreign aid, for example. Trade sanctions to promote a country's own preferences are rarely effective, and have no moral legitimacy (except for when they are used against repressive political regimes).

This and the previous principle help us draw a useful distinction between two styles of 'unilateralism'—one that is aimed at protecting differences, and the other aimed at reducing them. When the European Union drags its feet on agricultural trade liberalization, it is out of a desire to 'protect' a set of domestic social arrangements that Europeans, through their democratic procedures, have decided are worth maintaining. When, on the other hand, the United States threatens trade sanctions against Japan because its retailing practices are perceived to harm American exporters or against South Africa because its patent laws are perceived as too lax, it does so out of a desire to bring these countries' practices into line with its own. A well-designed world trade regime would leave room for the former, but prohibit the latter.

Other development-friendly measures. In addition to providing unrestricted access to least developed countries' exports and enabling developing countries to exercise greater autonomy in the use of subsidies, 'trade-related' investment, patent regulations and other measures, a development-friendly trade regime would do the following (see UNCTAD 2000; Raghavan 1996):

- greatly restrict the use of anti-dumping (AD) measures in advanced industrial countries when exports originate from developing countries. A small, but important step would be to require that the relevant investigating bodies take fully into account the consumer costs of anti-dumping action.
- allow greater mobility of workers across international boundaries, by liberalizing for example the movement of natural persons connected to trade in labour-intensive services (such as construction).
- require that all existing and future WTO agreements be fully costed out (in terms of implementation and other costs). It would condition the phasing in of these agreements in the developing countries on the provision of commensurate financial assistance.
- require additional compensation when a dispute settlement panel rules in favour of a developing country complainant, or (when compensation is not forthcoming) require that other countries join in the retaliation.
- provide expanded legal and fact-finding assistance to developing country members of the WTO in prospective dispute settlement cases.

Conclusions: From a Market-Exchange Perspective to a Development Perspective

Economists think of the WTO as an institution designed to expand free trade and thereby enhance consumer welfare, in the South no less than in the North. In reality, it is an institution that enables countries to bargain about market access. 'Free trade' is not the typical outcome of this process; nor is consumer welfare (much less development) what the negotiators have chiefly in mind. Traditionally, the agenda of multilateral trade negotiations has been shaped in response to a tug-of-war between exporters and multinational corporations in the advanced industrial countries (which have had the upper hand), on the one hand, and import-competing interests (typically, but not solely, labour) on the other. The chief textbook beneficiaries of free trade—consumers—do not sit at the table. The WTO can best be understood in this context, as the product of intense lobbying by specific exporter groups in the United States or Europe or of specific compromises between such groups and other domestic groups. The differential treatment of manufactures and agriculture, or of clothing and other goods within manufacturing, the anti-dumping regime, and the intellectual property rights (IPR) regime, to pick some of the major anomalies, are all results of this political process. Understanding this is essential, as it underscores the fact that there is very little in the structure of multilateral trade negotiations to ensure that their outcomes are consistent with development goals, let alone that they be designed to further development.

Hence there are at least three sources of slippage between what development requires and what the WTO does. First, even if free trade were optimal for development in its broad sense, the WTO does not fundamentally pursue free trade. Second, even if it did, there is no guarantee that free trade is the best trade policy for countries at low levels of development. Third, compliance with WTO rules, even when these rules are not harmful in themselves, crowds out a more fully developmental agenda—at both the international and national level.

My main argument has been that the world trading regime has to shift from a 'market access' perspective to a 'development' perspective (see Helleiner 2000:19). Essentially, the shift means that we should stop evaluating the trade regime from the perspective of whether it maximizes the flow of trade in goods and services, and ask instead, 'Do the trading arrangements—current and proposed—maximize the possibilities of development at the national level?' I have discussed why these two perspectives are not the same, even though they sometimes overlap, and have outlined some of the operational implications of such a shift. One is that developing nations have to articulate their needs not in terms of market access, but in terms of the policy autonomy that will allow them to exercise institutional innovations that depart from prevailing orthodoxies. A second is that the WTO should be conceived of not as an institution devoted to harmonization and the reduction of national institutional differences, but as one that manages the interface between different national systems.

This shift to a development perspective would have several important advantages. The first and more obvious is that it would provide for a more development-friendly international economic environment. Countries would be able to use trade as a means for development, rather than being forced to view trade as an end in itself

(and being forced to sacrifice development goals in the bargain). It would save developing countries precious political capital by obviating the need to bargain for ‘special and differential treatment’—a principle that in any case is more form than substance at this point.

Second, viewing the WTO as an institution that manages institutional diversity (rather than imposing uniformity) provides developing countries a way out of a conundrum inherent in their current negotiating stance. The problem arises from the inconsistency between their demands for space to implement their development policies on the one hand, and their complaints about northern protectionism in agriculture, textiles and labour and environmental standards, on the other. As long as the issues are viewed in market-access terms, developing countries will be unable to make a sound and principled defense of their legitimate need for space. And the only way they can gain enhanced market access is by restricting their own policy autonomy in exchange. Once the objective of the trading regime is seen as letting different national economic systems prosper side by side, the debate can become one about each nation’s institutional priorities and how they may be rendered compatible in a development-friendly way.

The third advantage of this shift in perspective is that it provides a way out of the impasse that the trading system finds itself post-Seattle. At present, two groups feel particularly excluded from the decision-making machinery of the global trade regime: developing country governments and northern NGOs. The former complain about the asymmetry in trade rules, while the latter charge that the system pays inadequate attention to values such as transparency, accountability, human rights and environmental sustainability. The demands of these two disenfranchised groups are often perceived to be conflicting—over questions such as labour and environmental standards or the transparency of the dispute settlement procedures—allowing the advanced industrial countries and the WTO leadership to seize the ‘middle’ ground. It is the demands of these two groups, and the apparent tension between them, that has paralyzed the process of multilateral trade negotiations in recent years.

But once the trade regime—and the governance challenges it poses—is seen from a development perspective, it becomes clear that developing country governments and many of the northern NGOs share the same goals: policy autonomy to pursue independent values and priorities, poverty reduction, and human development in an environmentally sustainable manner. The tensions over issues such as labour standards become manageable if the debate is couched in terms of development processes—broadly defined—instead of the requirements of market access. On all counts, then, the shift in perspective provides a better foundation for the multilateral trading regime.

The WTO should be conceived of not as an institution devoted to harmonization and the reduction of national institutional differences, but as one that manages the interface between different national systems.

Notes

1. See, for example, Mike Moore (2000) or his speech at the London Ministerial roundtable, 19 March 2001 (www.wto.org/english/news/).
2. The supposition that one set of institutional arrangements must dominate in terms of overall performance has produced the fads of the decade: Europe, with its low unemployment, high growth and thriving culture, was the continent to emulate throughout much of the 1970s; during the trade-conscious 1980s, Japan became the exemplar of choice; and the 1990s have been the decade of U.S.-style freewheeling capitalism.
3. For example, although Taiwan and Mexico are commonly regarded as following diametrically opposed development paths, figures provided by Little et al. (1970: 174-90) show that long after introducing trade reforms, Taiwan had a higher average ERP in manufacturing and greater variation in ERPs than did Mexico.
4. Although India did gradually liberalize its trade regime after 1991, its relative performance began to improve a full decade before these reforms went into effect (in the early 1980s).
5. The same is true of the promotion and subsidization of inward flows of direct foreign investment (see Hanson 2001).
6. A recent illustration is the dispute between Brazil and Canada over Brazil's subsidization of its aircraft manufacturer, Embraer. Brazil lost this case in the WTO, and will either remove the subsidies or have to put up with retaliation from Canada. The Republic of Korea, Taiwan, province of China and Mauritius subsidized their export industries for years without incurring similar sanctions.

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Trade and Sustainable Human Development Project
Bureau for Development Policy
United Nations Development Programme
1 United Nations Plaza
New York, NY 10017
www.undp.org/bdp



The Global Governance of Trade As If Development Really Mattered

Dani Rodrik



TRADE POLICY AND ECONOMIC GROWTH:
A SKEPTIC'S GUIDE TO THE CROSS-NATIONAL EVIDENCE

Francisco Rodríguez and Dani Rodrik
University of Maryland and Harvard University

Revised
May 2000

Department of Economics
University of Maryland
College Park, MD 20742
(301) 405-3480

John F. Kennedy School of Government
79 Kennedy Street
Cambridge, MA 02138
(617) 495-9454

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ABSTRACT

Do countries with lower policy-induced barriers to international trade grow faster, once other relevant country characteristics are controlled for? There exists a large empirical literature providing an affirmative answer to this question. We argue that methodological problems with the empirical strategies employed in this literature leave the results open to diverse interpretations. In many cases, the indicators of "openness" used by researchers are poor measures of trade barriers or are highly correlated with other sources of bad economic performance. In other cases, the methods used to ascertain the link between trade policy and growth have serious shortcomings. Papers that we review include Dollar (1992), Ben-David (1993), Sachs and Warner (1995), Edwards (1998), and Frankel and Romer (1999). We find little evidence that open trade policies--in the sense of lower tariff and non-tariff barriers to trade--are significantly associated with economic growth.

Francisco Rodríguez
Department of Economics
University of Maryland
College Park, MD 20742

Phone: (301) 405-3480
Fax: (301) 405-3542

Dani Rodrik
John F. Kennedy School of Government
Harvard University
79 Kennedy Street
Cambridge, MA 02138

Phone: (617) 495-9454
Fax: (617) 496-5747

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*"It isn't what we don't know that kills us. It's what we know that ain't so."
-- Mark Twain*

I. Introduction

Do countries with lower barriers to international trade experience faster economic progress? Few questions have been more vigorously debated in the history of economic thought, and none is more central to the vast literature on trade and development.

The prevailing view in policy circles in North America and Europe is that recent economic history provides a conclusive answer in the affirmative. Multilateral institutions such as the World Bank, IMF, and the OECD regularly promulgate advice predicated on the belief that openness generates predictable and positive consequences for growth. A recent report by the OECD (1998, 36) states: "More open and outward-oriented economies consistently outperform countries with restrictive trade and [foreign] investment regimes." According to the IMF (1997, 84): "Policies toward foreign trade are among the more important factors promoting economic growth and convergence in developing countries."

This view is widespread in the economics profession as well. Krueger (1998, 1513), for example, judges that it is straightforward to demonstrate empirically the superior growth performance of countries with "outer-oriented" trade strategies. According to Stiglitz (1998, 36), "[m]ost specifications of empirical growth regressions find that some indicator of external openness--whether trade ratios or indices of price distortions or average tariff level--is strongly associated with per-capita income growth." According to Fischer (2000), "[i]ntegration into the world economy is the best way for countries to grow."

Such statements notwithstanding, if there is an inverse relationship between trade barriers and economic growth, it is not one that immediately stands out in the data. See for example Figure I.1. The figure displays the (partial) associations over the 1975-1994 period between the growth rate of per-capita GDP and two measures of trade restrictions. The first measure is an average tariff rate, calculated by dividing total import duties by the volume of imports. The second is a coverage ratio for non-tariff barriers to trade.¹ The figures show the relationship between these measures and growth after controlling for levels of initial income and secondary education. In both cases, the slope of the relationship is only slightly negative and nowhere near statistical significance. This finding is not atypical. Simple measures of trade barriers tend not to enter significantly in well-specified growth regressions, regardless of time periods, sub-samples, or the conditioning variables employed.

Of course, neither of the two measures used above is a perfect indicator of trade restrictions. Simple tariff averages underweight high tariff rates because the corresponding import levels tend to be low. Such averages are also poor proxies for overall trade restrictions when tariff and non-tariff barriers are substitutes. As for the non-tariff coverage ratios, they do not do a good job of discriminating between barriers that are highly restrictive and barriers with little effect. And conceptual flaws aside, both indicators are clearly measured with some error (due to smuggling, weaknesses in the underlying data, coding problems, etc.).

In part because of concerns related to data quality, the recent literature on openness and growth has resorted to more creative empirical strategies. These strategies include: (a) constructing alternative indicators of openness (Dollar 1992; Sachs and Warner 1995); (b) testing robustness by using a wide range of measures of openness, including subjective indicators

¹ Data for the first measure come from the World Bank's World Development Indicators 1998. The second is taken from Barro and Lee (1994), and is based on UNCTAD compilations.

(Edwards 1992, 1998); and (c) comparing convergence experience among groups of liberalizing and non-liberalizing countries (Ben-David 1993). This recent round of empirical research is generally credited for having yielded stronger and more convincing results on the beneficial consequences of openness than the previous, largely case-based literature. Indeed, the cumulative evidence that has emerged from such studies provides the foundation for the previously-noted consensus on the growth-promoting effects of trade openness. The frequency with which these studies are cited in international economics textbooks and in policy discussions is one indicator of the influence that they have exerted.

Our goal in this paper is to scrutinize this new generation of research. We do so by focussing on what the existing literature has to say on the following question: *Do countries with lower policy-induced barriers to international trade grow faster, once other relevant country characteristics are controlled for?* We take this to be the central question of policy relevance in this area. To the extent that the empirical literature demonstrates a positive causal link from openness to growth, the main operational implication is that governments should dismantle their barriers to trade. Therefore, it is critical to ask how well the evidence supports the presumption that doing so would raise growth rates.

Note that this question differs from an alternative one we could have asked: *Does international trade raise growth rates of income?* This is a related, but conceptually distinct question. Trade policies do affect the volume of trade, of course. But there is no strong reason to expect their effect on growth to be quantitatively (or even qualitatively) similar to the consequences of changes in trade volumes that arise from, say, reductions in transport costs or increases in world demand. To the extent that trade restrictions represent policy responses to real or perceived market imperfections or, at the other extreme, are mechanisms for rent-extraction,

they will work differently from natural or geographical barriers to trade and other exogenous determinants. Frankel and Romer (1999) recognize this point in their recent paper on the relationship between trade volumes and income levels. These authors use the geographical component of trade volumes as an instrument to identify the effects of trade on income levels. They appropriately caution that their results cannot be directly applied to the effects of trade policies.

From an operational standpoint, it is clear that the relevant question is the one having to do with the consequences of trade *policies* rather than trade *volumes*. Hence we focus on the recent empirical literature that attempts to measure the effect of trade policies. Our main finding is that this literature is largely uninformative regarding the question we posed above. There is a significant gap between the message that the consumers of this literature have derived and the "facts" that the literature has actually demonstrated. The gap emerges from a number of factors. In many cases, the indicators of "openness" used by researchers are problematic as measures of trade barriers or are highly correlated with other sources of poor economic performance. In other cases, the empirical strategies used to ascertain the link between trade policy and growth have serious shortcomings, the removal of which results in significantly weaker findings.

The literature on openness and growth through the late 1980s was usefully surveyed in a paper by Edwards (1993). This survey covered detailed multi-country analyses (such as Little et al. 1970 and Balassa 1971) as well as cross-country econometric studies (such as Feder 1983, Balassa 1985, and Esfahani 1991). Most of the cross-national econometric research that was available up to that point focussed on the relationship between exports and growth, and not on trade policy and growth. Edwards' evaluation of this literature was largely negative (1993, 1389):

[M]uch of the cross-country regression based studies have been plagued by empirical and conceptual shortcomings. The theoretical frameworks used have been increasingly simplistic, failing to address important questions such as the exact mechanism through which export expansion affects GDP growth, and ignoring potential determinants of growth such as educational attainment. Also, many papers have been characterized by a lack of care in dealing with issues related to endogeneity and measurement errors. All of this has resulted, in many cases, in unconvincing results whose fragility has been exposed by subsequent work.

Edwards argued that such weaknesses had reduced the policy impact of the cross-national econometric research covered in his review.

Our paper picks up where Edwards' survey left off. We focus on a number of empirical papers that either were not included in or have appeared since that survey. Judging by the number of citations in publications by governmental and multilateral institutions and in textbooks, this recent round of empirical research has been considerably more influential in policy and academic circles.² Our detailed analysis covers the four papers that are probably the best known in the field: Dollar (1992), Sachs and Warner (1995), Ben-David (1993), and Edwards (1998). We also include an analysis of Frankel and Romer (1999), and shorter discussions of Lee (1993), Harrison (1996), and Wacziarg (1998).

² We gave examples of citations from international institutions above. Here are some examples from recent textbooks. Yarbrough and Yarbrough (2000, 19) write "[o]n the trade-growth connection, the empirical evidence is clear that countries with open markets experience faster growth," citing Edwards (1998). Caves, Frankel and Jones (1999, 256-257) warn that "[r]esearch testing this proposition is not unanimous" but then continue to say "productivity growth does seem to increase with openness to the international economy and freedom from price and allocative distortions in the domestic economy," citing Sachs and Warner (1995) and Dollar (1992). Husted and Melvin (1997) cite Ben-David (1993) in support of the FPE theorem (p. 111) and Sachs and Warner (1995) in support of the statement that "[o]nly a few countries have followed outward-oriented development strategies for extensive periods of time, but those that have done so have been very successful" (p. 287). Krugman and Obstfeld (1997, 260) write that by the late 1980s "[s]tatistical evidence appeared to suggest that developing countries that

A few words about the selection of papers. The paper by Dollar (1992) was not reviewed in Edwards' survey, perhaps because it had only recently been published. We include it here since it is, by our count, the most heavily cited empirical paper on the link between openness and growth. Sachs and Warner (1995) is a close second, and the index of "openness" constructed therein has now been widely used in the cross-national research on growth.³ The other two papers are also well known, but in these cases our decision was based less on citation counts than on the fact that they are representative of different types of methodologies. Ben-David (1993) considers income convergence in countries that have integrated with each other (such as the European Community countries). Edwards (1998) undertakes a robustness analysis using a wide range of trade-policy indicators, including some subjective indicators. Some of the other recent studies on the relationship between trade policy and growth will be discussed in the penultimate section of the paper.

Our bottom line is that the nature of the relationship between trade policy and economic growth remains very much an open question. The issue is far from having been settled on empirical grounds. We are in fact skeptical that there is a general, unambiguous relationship between trade openness and growth waiting to be discovered. We suspect that the relationship is a contingent one, dependent on a host of country and external characteristics. Research aimed at ascertaining the circumstances under which open trade policies are conducive to growth (as well as those under which they may not be) and at scrutinizing the channels through which trade policies influence economic performance is likely to prove more productive.

followed relatively free trade policies had on average grown more rapidly than those that followed protectionist policies (although this statistical evidence has been challenged by some economists)."

³ From its date of publication, Dollar's paper has been cited at least 92 times, according to the *Social Science Citations Index*. Sachs and Warner (1995) is a close second, with 81 citations. Edwards (1992), Ben-David (1993) and Lee (1993) round off the list, with 57, 38 and 17 citations respectively.

Finally, it is worth reminding the reader that growth and welfare are not the same thing. Trade policies can have positive effects on welfare without affecting the rate of economic growth. Conversely, even if policies that restrict international trade were to reduce economic growth, it does not follow that they would necessarily reduce the level of welfare. Negative coefficients on policy variables in growth regressions are commonly interpreted as indicating that the policies in question are normatively undesirable. Strictly speaking, such inferences are invalid.⁴ Our paper centers on the relationship between trade policy and growth because this is the issue that has received the most attention in the existing literature. We caution the reader that the welfare implications of empirical results regarding this link (be they positive or negative) must be treated with caution.

The outline of this paper is as follows. We begin with a conceptual overview of the issues relating to openness and growth. We then turn to an in-depth examination of each of the four papers mentioned previously (Dollar 1992; Sachs and Warner 1995; Edwards 1998; and Ben-David 1993), followed by a section on Frankel and Romer (1999). The penultimate section discusses briefly three other papers (Lee 1993; Harrison 1996; and Wacziarg 1998). We offer some final thoughts in the concluding section.

II. Conceptual issues

Think of a small economy that takes world prices of tradable goods as given. What is the relationship between trade restrictions and real GDP in such an economy? The modern theory of

⁴ Some of the main problems with economic growth as a measure of welfare are that: (i) the empirically identifiable effect of policies on rates of growth--especially over short intervals--could be different from their effect on levels of income; (ii) levels of per capita income may not be good indicators of welfare because they do not capture the distribution of income or the level of access to primary goods and basic capabilities; and (iii) high growth rates could be associated with suboptimally low levels of present day consumption.

trade policy as it applies to such a country can be summarized in the following three propositions:

1. In static models with no market imperfections and other pre-existing distortions, the effect of a trade restriction is to reduce the level of real GDP at world prices. In the presence of market failures such as externalities, trade restrictions may increase real GDP (although they are hardly ever the first-best means of doing so).
2. In standard models with exogenous technological change and diminishing returns to reproducible factors of production (e.g., the neo-classical model of growth), a trade restriction has no effect on the long-run (steady-state) rate of growth of output.⁵ This is true regardless of the existence of market imperfections. However, there may be growth effects during the transition to the steady state. (These transitional effects could be positive or negative depending on how the long-run level of output is affected by the trade restriction.)
3. In models of endogenous growth generated by non-diminishing returns to reproducible factors of production or by learning-by-doing and other forms of endogenous technological change, the presumption is that lower trade restrictions boost output growth in the world economy as a whole. But a subset of countries may experience diminished growth depending on their initial factor endowments and levels of technological development.

Taken together, these points imply that there should be no theoretical presumption in favor of finding an unambiguous, negative relationship between trade barriers and growth rates

⁵ Strictly speaking, this statement is true only when the marginal product of the reproducible factors ("capital") tends to zero in the limit. If this marginal product is bounded below by a sufficiently large positive constant, trade policies can have an effect on long-run growth rates, similar to their effect in the more recent endogenous growth models (point 3 below). See the discussion in Srinivasan (1997).

in the types of cross-national data sets typically analyzed.⁶ The main complications are twofold. First, in the presence of certain market failures, such as positive production externalities in import-competing sectors, the long-run levels of GDP (measured at world prices) can be higher with trade restrictions than without. In such cases, data sets covering relatively short time spans will reveal a positive (partial) association between trade restrictions and the growth of output along the path of convergence to the new steady state. Second, under conditions of endogenous growth, trade restrictions may also be associated with higher growth rates of output whenever the restrictions promote technologically more dynamic sectors over others. In dynamic models, moreover, an increase in the growth rate of output is neither a necessary nor a sufficient condition for an improvement in welfare.

Since endogenous growth models are often thought to have provided the missing theoretical link between trade openness and long-run growth, it is useful to spend a moment on why such models in fact provide an ambiguous answer. As emphasized by Grossman and Helpman (1991), the general answer to the question "does trade promote innovation in a small open economy" is: "it depends."⁷ In particular, the answer varies depending on whether the forces of comparative advantage push the economy's resources in the direction of activities that generate long-run growth (via externalities in research and development, expanding product variety, upgrading product quality, and so on) or divert them from such activities. Grossman and Helpman (1991), Feenstra (1990), Matsuyama (1992), and others have worked out examples where a country that is behind in technological development can be driven by trade to specialize

⁶ See Buffie (1998) for an extensive theoretical discussion of the issues from the perspective of developing countries.

⁷ This is a slight paraphrase of Grossman and Helpman (1991, 152).

in traditional goods and experience a reduction in its long-run rate of growth. Such models are in fact formalizations of some very old arguments about infant industries and about the need for temporary protection to catch up with more advanced countries.

The issues can be clarified with the help of a simple model of a small open economy with learning-by-doing. The model is a simplified version of that in Matsuyama (1992), except that we analyze the growth implications of varying the import tariff, rather than simply comparing free trade to autarky. The economy is assumed to have two sectors, agriculture (a) and manufacturing (m), with the latter subject to learning-by doing that is external to individual firms in the sector but internal to manufacturing as a whole. Let labor be the only mobile factor between the two sectors, and normalize the economy's labor endowment to unity. We can then write the production functions of the manufacturing and agricultural sectors, respectively, as:

$$X_t^m = M_t n_t^a$$

$$X_t^a = A(1 - n_t)^a \quad ,$$

where n_t stands for the labor force in manufacturing, a is the share of labor in value added in the two sectors (assumed to be identical for simplicity), and t is a time subscript. The productivity coefficient in manufacturing M_t is a state variable evolving according to:

$$\dot{M}_t = d X_t^m ,$$

where an overdot represents a time derivative and d captures the strength of the learning effect.

We assume the economy has an initial comparative disadvantage in manufacturing, and normalize the relative price of manufactures on world markets to unity. If the ad-valorem import tariff on manufactures is t , the domestic relative price of manufactured goods becomes $(1 + t)$.

Instantaneous equilibrium in the labor market requires the equality of value marginal products of labor in the two sectors:

$$A(1-n_t)^{a-1} = (1+t)M_t n_t^{a-1}.$$

It can be checked that an increase in the import tariff has the effect of allocating more of the economy's labor to the manufacturing sector:

$$\frac{dn_t}{dt} > 0.$$

Further, for a constant level of t , n_t evolves according to:

$$\hat{n}_t = \left(\frac{d}{1-a} \right) (1-n_t) n_t^a,$$

where a " $\wedge$ " denotes proportional changes.

Let Y_t denote the value of output in the economy evaluated at world prices:

$$Y_t = M_t n_t^a + A(1-n_t)^a.$$

Then the instantaneous rate of growth of output at world prices can be expressed as follows:

$$\hat{Y}_t = d \left[l_t + \left(\frac{a}{1-a} \right) (l_t - n_t) \right] n_t^a,$$

where l_t is the share of manufacturing output in total output when both are expressed at world prices (i.e., $l_t = X_t^m / Y_t$).

Consider first the case when $t = 0$. In this case, it can be checked that $l_t = n_t$ and the expression for the instantaneous growth rate of output simplifies to $\hat{Y}_t = d l_t n_t^a$, which is strictly positive whenever $n_t > 0$. Growth arises from the dynamic effects of learning, and is faster the larger the manufacturing base n_t . A small tariff would have a positive effect on growth on account of this channel because it would enlarge the manufacturing sector (raise n_t).

When $t > 0$, the manufacturing share of output at world prices is less than the labor share in manufacturing, and $l_t < n_t$. Now the second term in the expression for $\hat{Y}_t$ is negative. The intuition is as follows. The tariff imposes a production-side distortion in the allocation of the economy's resources. For any given gap between l_t and n_t , the productive efficiency cost of this distortion rises as manufacturing output (the base of the distortion) gets larger.

Hence the tariff exerts two contradictory effects on growth. By pulling resources into the manufacturing sector, it enlarges the scope for dynamic scale benefits, thereby increasing growth. But it also imposes a static efficiency loss, the cost of which rises over time as the manufacturing sector becomes larger.⁸ Figure II.1 shows the relationship between the tariff and the rate of growth of output (at world prices) for a particular parameterization of this model. Two curves are shown, one for the instantaneous rate of growth (based on the expression above), and the other for the average growth rate over a twenty-year horizon (calculated as $[1/20] \times [\ln Y_{20} - \ln Y_0]$). In both cases, growth increases in t until a critical level, and then diminishes in t . This pattern is, however, by no means general, and other types of results can be obtained under different parameterizations.

The model clarifies a number of issues. First, it shows that it is relatively straightforward to write a well-specified model that generates the conclusions that many opponents of trade openness have espoused--namely that free trade can be detrimental to some countries' economic prospects, especially when these countries are lagging in technological development and have an initial comparative advantage in "non-dynamic" sectors. More broadly, the model illustrates that

⁸ We emphasize once again that these results on the growth of output do not translate directly into welfare consequences. In this particular model, the level effect of a tariff distortion also has to be taken into account before a judgement on welfare can be passed. Hence it is possible for welfare to be reduced (raised) even though the growth rate of output is (permanently) higher (lower).

there is no determinate theoretical link between trade protection and growth once real-world phenomena such as learning, technological change, and market imperfections (here captured by a learning-by-doing externality) are taken into account. Third, it highlights the exact sense in which trade restrictions distort market outcomes. A trade barrier has resource-allocation effects because it alters a domestic price ratio: it raises the domestic price of import-competing activities relative to the domestic price of exportables, and hence introduces a wedge between the domestic relative-price ratio and the opportunity costs reflected in relative border prices.⁹ While this point is obvious, it bears repeating as some of the empirical work reviewed below interprets openness in a very different manner.

III. David Dollar (1992)

As mentioned previously, the paper by Dollar (1992) is one of the most heavily cited studies on the relationship between openness and growth. The principal contribution of Dollar's paper lies in the construction of two separate indices, which Dollar demonstrates are each negatively correlated with growth over the 1976-85 period in a sample of 95 developing countries. The two indices are an "index of real exchange rate distortion" and an "index of real exchange rate variability" (henceforth DISTORTION and VARIABILITY). These indices relate to "outward orientation," as understood by Dollar (1992, 524), in the following way:

Outward orientation generally means a combination of two factors: first, the level of protection, especially for inputs into the production process, is relatively low (resulting in

⁹ Some authors have stressed the effects that the high levels of discretion associated with trade policies can have on rent-seeking and thus on economic performance (Krueger, 1974; Bhagwati, 1982). These effects go beyond the direct impact on resource allocation that we discuss. They are however related more directly to the discretionary nature of policies than to their effect on the economy's openness. Discretionary export promotion policies--which will make an economy more open--should in principle be just as conducive to rent-seeking as protectionist policies.

a sustainable level of the real exchange rate that is favorable to exporters); and second, there is relatively little variability in the real exchange rate, so that incentives are consistent over time.

We shall argue that DISTORTION has serious conceptual flaws as a measure of trade restrictions, and is in any case not a robust correlate of growth, while VARIABILITY, which appears to be robust, is a measure of instability more than anything else.

In order to implement his approach, Dollar uses data from Summers and Heston (1988, Mark 4.0) on comparative price levels. The Summers-Heston work compares prices of an identical basket of consumption goods across countries. Hence, letting the U.S. be the benchmark country, these data provide estimates of each country i 's price level (RPL_i) relative to the U.S.: $RPL_i = 100 \times P_i / (e_i P_{US})$, where P_i and P_{US} are the respective consumption price indices, and e_i is the nominal exchange rate of country i against the U.S. dollar (in units of home currency per dollar).¹⁰ Since Dollar is interested in the prices of tradable goods only, he attempts to purge the effect of systematic differences arising from the presence of non-tradables. To do this, he regresses RPL_i on the level and square of GDP per capita and on regional dummies for Latin America and Africa, as well as year dummies. Let the predicted value from this regression be denoted $\hat{RPL}_i$. Dollar's index of DISTORTION is $RPL_i / \hat{RPL}_i$, averaged over the ten-year period 1976-1985. VARIABILITY is in turn calculated by taking the coefficient of variation of the annual observations of $RPL_i / \hat{RPL}_i$ for each country over the same period.

Dollar interprets the variation in the values of DISTORTION across countries as capturing cross-national differences in the restrictiveness of trade policy. He states: "the index derived here measures the extent to which the real exchange rate is distorted away from its free-

trade level by the trade regime" and "a country sustaining a high price level over many years would clearly have to be a country with a relatively large amount of protection" (Dollar 1992, 524). Since this type of claim is often made in other work as well,¹¹ we shall spend some time on it before reviewing Dollar's empirical results. We will show that a comparison of price indices for tradables is informative about levels of trade protection only under very restrictive conditions that are unlikely to hold in practice.

Trade policies and price levels

We will not discuss further Dollar's method for purging the component of non-tradable goods prices that is systematically related to income and other characteristics.¹² Assuming the method is successful, the DISTORTION measure approximates (up to a random error term) the price of a country's tradables relative to the U.S. Letting P^T stand for the price index for tradables and neglecting the error, the DISTORTION index for country i can then be expressed as $P_i^T / (e_i P_{US}^T)$.

Let us, without loss of generality, fix the price level of tradables in the U.S., P_{US}^T , and assume that free trade prevails in the U.S. The question is under what conditions will trade restrictions be associated with higher levels of $P_i^T / (e_i P_{US}^T)$. Obviously, the answer depends on the effect of the restrictions on P_i^T (and possibly on e_i).

¹⁰ Our notation differs from Dollar's (1992). In particular, the exchange rate is defined differently.

¹¹ E.g., in Bhalla and Lau (1992), whose index is also used in Harrison (1996). We will discuss Harrison's paper in the penultimate section.

¹² For a good recent discussion of the problems that may arise on this account see Falvey and Gemmell (1999).

Note that P_i^T is an aggregate price index derived from the domestic prices of two types of tradables, import-competing goods and exportables. Hence P_i^T can be expressed as a linearly homogenous function of the form:

$$P_i^T = p(p_i^m, p_i^x)$$

where p_i^m and p_i^x are the domestic prices of import-competing goods and exportables, respectively. Since Summers-Heston price levels are estimated for an identical basket of goods, the price-index function $p(\cdot)$ applies equally to the U.S.

$$P_{US}^T = p(p_{US}^m, p_{US}^x)$$

Next, define t_i^m and as t_i^x the ad-valorem equivalent of import restrictions and export restrictions, respectively. Assume that the law of one price holds (we shall relax this below).

Then, $p_i^m = e_i p_{US}^m (1 + t_i^m)$ and $p_i^x = e_i p_{US}^x / (1 + t_i^x)$. Consequently, the domestic price of tradables relative to U.S. prices can be expressed as

$$\frac{P_i^T}{e_i P_{US}^T} = \frac{p(p_{US}^m (1 + t_i^m), p_{US}^x / (1 + t_i^x))}{p(p_{US}^m, p_{US}^x)} = \frac{(1 + t_i^m) p(p_{US}^m, \frac{p_{US}^x}{(1 + t_i^x)(1 + t_i^m)})}{p(p_{US}^m, p_{US}^x)},$$

where we have made use of the linear homogeneity of $\pi(\cdot)$. Note that the nominal exchange rate has dropped out thanks to the assumption of the law of one price.

Consider first the case where there are binding import restrictions, but no export restrictions ($t_i^m > 0$ and $t_i^x = 0$). In this instance, it is apparent that $P_i^T > e_i P_{US}^T$, and trade restrictions do indeed raise the domestic price of tradables (relative to the benchmark country). Judging from the quotations above, this is the case that Dollar seems to have in mind.

On the other hand, consider what happens when the country in question rescinds all import restrictions and imposes instead export restrictions at an ad-valorem level that equals that of the import restrictions just lifted ($t_i^m = 0$ and $t_i^x > 0$). From the Lerner (1936) symmetry theorem, it is evident that the switch from import protection to export taxation has no resource-allocation and distributional effects for the economy whatsoever. The relative price between tradables, p_i^m / p_i^x , remains unaffected by the switch. Yet, because export restrictions reduce the domestic price of exportables relative to world prices, it is now the case that $P_i^T < e_i P_{US}^T$. The country will now appear, by Dollar's measure, to be outward oriented.

One practical implication is that economies that combine import barriers with export taxes (such as many countries in Sub-Saharan Africa) will be judged less protected than those that rely on import restrictions alone. Conversely, countries that dilute the protective impact of import restrictions by using export subsidies ($t_i^x < 0$) will appear more protected than countries that do not do so.

Hence the DISTORTION index is sensitive to the form in which trade restrictions are applied. This follows from the fact that trade policies work by altering relative prices within an economy; they do not have unambiguous implications for the level of prices in a country relative to another. A necessary condition for Dollar's index to do a good job of ranking trade regimes according to restrictiveness is that export policies (whether they tax or promote exports) play a comparatively minor role. Moreover, as we show in the next section, this is not a sufficient condition.

How relevant is the law of one price in practice?

The discussion above was framed in terms that are the most favorable to Dollar's measure, in that we assumed the law of one price (LOP) holds. Under this maintained hypothesis, the prices of tradable goods produced in different countries can diverge from each other, when expressed in a common currency, only when there exist trade restrictions (or transport costs).

However, there is a vast array of evidence suggesting that LOP does not accurately describe the world we live in. In a recent review article, Rogoff (1996, 648) writes of the "startling empirical failure of the law of one price." Rogoff concludes: "commodities where the deviations from the law of one price damp out very quickly are the exception rather than the rule" (Rogoff 1996, 650). Further, the evidence suggests that deviations from LOP are systematically related to movements in nominal exchange rates (see references in Rogoff 1996). Indeed, it is well known that (nominal) exchange-rate policies in many developing countries are responsible for producing large and sustained swings in real exchange rates. Trade barriers or transport costs typically play a much smaller role.

Dollar (1992, 525) acknowledges that "there might be short-term fluctuations [unrelated to trade barriers] if purchasing-power parity did not hold continuously," but considers that these fluctuations would average out over time. Rogoff (1996, 647) concludes in his survey that the speed of convergence to purchasing-power parity (PPP) is extremely slow, of the order of roughly 15 percent per year. At this speed of convergence, averages constructed over a time horizon of 10 years (the horizon used in Dollar's paper) would exhibit substantial divergence from PPP in the presence of nominal shocks.

Under this interpretation, a significant portion of the cross-national variation in price levels exhibited in DISTORTION would be due not to trade policies, but to monetary and

exchange-rate policies. Unlike trade policies, nominal exchange-rate movements have an unambiguous effect on the domestic price level of traded goods relative to foreign prices when LOP fails: an appreciation raises the price of both import-competing and exportable goods relative to foreign prices, and a depreciation has the reverse effect. Countries where the nominal exchange rate was not allowed to depreciate in line with domestic inflation would exhibit an appreciation of the real exchange rate (a rise in domestic prices relative to foreign levels), and correspondingly would be rated high on the DISTORTION index. Countries with aggressive policies of devaluation (or low inflation relative to the trend depreciation of their nominal exchange rate) would receive low DISTORTION ratings.

Transport costs provide another reason why DISTORTION may be unrelated to trade policies, especially in a large cross-section of countries. Dollar's index would be influenced by geographic variables such as access to sea routes and distance to world markets, even when the LOP—appropriately modified to account for transport costs—holds. Hence in practice DISTORTION is likely to capture the effects of geography as well as of exchange-rate policies. Indeed, when we regress Dollar's DISTORTION index on the black market premium (a measure of exchange rate policy), a set of continent dummies, and two trade-related geographic variables (the coastal length over total land area and a dummy for tropical countries), we find that these explain more than 50 percent of the variation in Dollar's distortion index. Furthermore, two trade policy variables (tariffs and quotas) enter with the wrong sign (Table III.1)!

To summarize, DISTORTION is theoretically appropriate as a measure of trade restrictions when three conditions hold: (a) there are no export taxes or subsidies in use; (b) the law of one price holds continuously; and (c) there are no systematic differences in national price levels due to transport costs and other geographic factors. Obviously, all of these requirements

are counterfactual. Whether one believes that DISTORTION still provides useful empirical information on trade regimes depends on one's priors regarding the practical significance of the three limitations expressed above.¹³ Our view is that the second and third of these--the departure from LOP and the effect of geography--are particularly important in practice. We regard it as likely that it is the variance in nominal exchange-rate policies and geography, and not the variance in trade restrictions, that drives the cross-sectional variance of DISTORTION.

Why variability?

As mentioned previously, Dollar (1992) uses his measure of DISTORTION in conjunction with a measure of VARIABILITY, the latter being the coefficient of variation of DISTORTION measured on an annual basis. He is driven to do this because the country rankings using DISTORTION produce some "anomalies." For example, "Korea and Taiwan have the highest distortion measures of the Asian developing economies" and "the rankings within the developed country groups are not very plausible" (Dollar 1992, 530-531). The ten least distorted countries by this measure include not only Hong Kong, Thailand, Malta, but also Sri Lanka, Bangladesh, Mexico, South Africa, Nepal, Pakistan and Syria! Burma's rating (90) equals that of the United States. Taiwan (116) is judged more distorted than Argentina (113). Our discussion above indicated that DISTORTION is highly sensitive to the form in which trade policies are applied and to exchange-rate policies as well as omitted geographic characteristics. So such results are not entirely surprising.

¹³ The sensitivity of Dollar's index to these assumptions highlights a generic difficulty with regression-based indices which use the residual from a regression to proxy for an excluded variable: such indices capture variations in the excluded variable accurately only as long as the model is correctly and fully specified. If some variables are excluded from the estimated equation, they will form part of the index.

Dollar states that the "number of anomalies declines substantially if the real exchange rate distortion measure is combined with real exchange rate variability to produce an outward orientation index" (Dollar 1992, 531). He thus produces a country ranking based on a weighted average of the DISTORTION and VARIABILITY indices. Since these two indices are entered separately in his growth regressions, we shall not discuss this combined index of "outward orientation" further.

However, we do wish to emphasize the obvious point that the VARIABILITY index has little to do with trade restrictions, as commonly understood, or with inward- or outward-orientation per se. What does VARIABILITY really measure? The ten countries with the highest VARIABILITY scores are Iraq, Uganda, Bolivia, El Salvador, Nicaragua, Guyana, Somalia, Nigeria, Ghana, and Guatemala. For the most part, these are countries that have experienced very high inflation rates and/or severe political disturbances during the 1976-85 period. It is plausible that VARIABILITY measures economic instability at large. In any case, it is unclear to us why we should think of it as an indicator of trade orientation.

Empirical results

The first column of Table III.2 shows our replication of the core Dollar (1992) result for 95 developing countries. Dollar's benchmark specification includes on the right-hand side the investment rate (as a share of GDP, averaged over 1976-85) in addition to DISTORTION and VARIABILITY. As shown in column (1), DISTORTION and VARIABILITY both enter with negative and highly significant coefficients using this specification. (Our results are virtually identical to those in Dollar (1992), with the difference that our t-statistics are based on heteroskedasticity-corrected standard errors.)

None of Dollar's runs include standard regressors such as initial income, education, and regional dummies. The other columns of Table III.2 show the results as we alter Dollar's specification to make it more compatible with recent cross-national work on growth (e.g., Barro 1997). First, we add regional dummies for Latin America, East Asia, and Sub-Saharan Africa to ensure that the results are not due to omitted factors correlated with geographical location (column 2). Next we drop the investment rate (column 3), and add in succession initial income (column 4) and initial schooling (column 5).¹⁴ The dummies for Latin America and Sub-Saharan Africa are negative and statistically significant. Initial income and education also enter significantly, with the expected signs (negative and positive, respectively).

We find that the VARIABILITY index is robust to these changes, but that DISTORTION is not. In fact, as soon as we introduce regional dummies in the regression, the estimated coefficient on DISTORTION comes down sizably and becomes insignificant. Whatever DISTORTION may be measuring, this raises the possibility that the results with this index are spurious, arising from the index's correlation with (omitted) regional effects.

Dollar's original results were based on data from Mark 4.0 of the Summers-Heston database (Summers and Heston 1988). We have re-calculated Dollar's DISTORTION and VARIABILITY indices using the more recent version (Mark 5.6) of the Summers-Heston data, confining ourselves to the same period examined by Dollar (1976-85). The revised data allow us to generate these indices for 112 developing countries. We have also re-ran the regressions for cross-sections over different periods, as well as in panel form with fixed effects. We do not report these results here for reasons of space (see the working paper version of this paper, Rodríguez and Rodrik 1999). The bottom line that emerges is similar to the conclusion just

¹⁴ The income variable comes from the Summers-Heston (Mark 4.0) data set used in Dollar (1992). Schooling is from Barro and Lee (1994).

stated: the estimated coefficient on VARIABILITY is generally robust to alterations in specifications; the coefficient on DISTORTION is not.

IV. Jeffrey Sachs and Andrew Warner (1995)

We turn next to the paper “Economic Reform and the Process of Global Integration” by Jeffrey Sachs and Andrew Warner (1995). This extremely influential paper¹⁵ is an ambitious attempt to solve the measurement error problem in the literature by constructing an index of openness that combines information about several aspects of trade policy. The Sachs-Warner (SW) openness indicator (OPEN) is a zero-one dummy, which takes the value 0 if the economy was closed according to any one of the following criteria:

1. it had average tariff rates higher than 40% (TAR);
2. its nontariff barriers covered on average more than 40% of imports (NTB);
3. it had a socialist economic system (SOC);
4. it had a state monopoly of major exports (MON);
5. its black market premium exceeded 20% during either the decade of the 1970s or the decade of the 1980s (BMP).¹⁶

The rationale for combining these indicators into a single dichotomous variable is that they represent different ways in which policymakers can close their economy to international trade. Tariffs set at 50 percent have exactly the same resource-allocation implications as quotas at a level that raised domestic market prices for importables by 50 percent. To gauge the effect

¹⁵ A partial listing of papers that have made use of the Sachs-Warner index includes Hall and Jones (1998), Wacziarg (1998), Sala-i-Martin (1997), Burnside and Dollar (1997), and Collins and Bosworth (1996).

¹⁶ Sachs and Warner use data from the following sources: Lee (1993) for non-tariff barriers, Barro and Lee (1993) for tariffs, World Bank (1994) for state monopoly of exports, Kornai (1992) for the classification of socialist and non-socialist countries, and International Currency Analysis (various years) for black market premia.

of openness on growth, it is necessary to use a variable that classifies as closed those countries that were able to effectively restrict their economies' integration into world markets through the use of different combinations of policies that would achieve that result. Furthermore, if these openness indicators are correlated among themselves, introducing them separately in a regression may not yield reliable estimates due to their possibly high level of collinearity.

The Sachs-Warner dummy has a high and robust coefficient when inserted in growth regressions. The point estimate of its effect on growth (in the original benchmark specification) is 2.44 percentage points:¹⁷ economies that pass all five requirements experience on average economic growth two and a half percentage points higher than those that do not. The t-statistic is 5.50 (5.83 if estimated using robust standard errors). This coefficient appears to be highly robust to changes in the list of controls: in a recent paper which subjects 58 potential determinants of growth to an exhaustive sensitivity analysis, the average p-value for the Sachs-Warner index is less than 0.1 percent.¹⁸

In this section we ask several questions about the Sachs-Warner results. First, we ask which, if any, of the individual components of the index are responsible for the strength of the Sachs-Warner dummy. We find that the Sachs-Warner dummy's strength derives mainly from the combination of the black market premium (BMP) and the state monopoly of exports (MON) variables. Very little of the dummy's statistical power would be lost if it were constructed using only these two indicators. In particular, there is little action in the two variables that are the most direct measures of trade policy: tariff and non-tariff barriers (TAR and NTB).

¹⁷ In the long run, such an economy would converge to a level of per capita GDP 2.97 times as high as if it had remained closed.

¹⁸ Sala-i-Martin (1997). The variable used by Sala-i-Martin is the number of years an economy was open according to the Sachs-Warner criteria, whereas here we follow Sachs and Warner's (1995) original article and use a dummy which captures whether or not the economy was open during the 1970-89 time period.

We then ask to what extent the black-market premium and state monopoly variables are measures of trade policy. We suggest that their significance in explaining growth can be traced to their correlation with other determinants of growth: macroeconomic problems in the case of the black-market premium, and location in Sub-Saharan Africa in the case of the state monopoly variable. We conclude that the Sachs-Warner indicator serves as a proxy for a wide range of policy and institutional differences, and that it yields an upwardly-biased estimate of the effects of trade restrictions proper.

Which individual variables account for the significance of the Sachs-Warner dummy?

We start by contrasting Sachs and Warner's result with the results of controlling separately for individual components of their index. Column 1 of Table IV.1 reproduces their baseline regression and column 2 shows what happens when each of the components of the Sachs-Warner index is inserted separately into the same specification.¹⁹ The variables BMP and MON are highly significant, whereas the rest are not. An F-test for the joint significance of the other three components (SOC, TAR and NTB) yields a p-value of 0.25.

To check whether it is mainly the combination of BMP and MON that drives the Sachs-Warner result, we ask the following question: suppose that we had built a dummy variable, in the spirit of Sachs and Warner, which classified an economy as closed only if it was closed according to BMP and MON. That is, suppose we ignored the information the other three

¹⁹ We use the same set of controls used by Sachs and Warner. These are log of GDP in 1970, secondary schooling in 1970, primary schooling in 1970, government consumption as a percent of GDP, number of revolutions and coups per year, number of assassinations per million population, relative price of investment goods, and ratio of investment to GDP. However, our results are highly robust to changes in the list of controls. For example, the simple correlations of TAR, NTB and SOC with growth are, respectively, -.048, -.083 and -.148. Our result is also not due to multicollinearity: the R^2 s from regressions of either of SOC, NTB and TAR on the other two are, respectively, 0.02, 0.05. and 0.05.

variables give us as to the economy's openness. How significant would the coefficient of our variable be in a growth regression? How different would the partition between open and closed economies that it generates be from that generated by the SW dummy? Suppose alternatively that we also constructed an openness dummy based only on the information contained in SOC, NTB, and TAR. How significant would that variable be in a growth regression? And how correlated would it be with the Sachs-Warner index?

Columns (3)-(6) of Table IV.1 address the question of significance. We denote as BM a variable that takes the value 1 when the economy is "open" according to criteria 4 and 5 above, whereas SQT equals 1 when the economy passes criteria 1, 2 and 3. We substitute these variables for the SW openness index in the regression Sachs and Warner present in their paper. Entered on its own, BM is highly significant, with an estimated coefficient that is very close to that on OPEN (2.09 versus 2.44; see column 3). When SQT is substituted for BM, the estimated coefficient on SQT is much smaller (0.88) and significant only at the 90 percent level (column 4). We next enter BM and SQT simultaneously: the coefficient of SQT now has a t-statistic of 1.59, whereas the coefficient on BM retains a t-statistic of 5.09 and a point estimate (2.12) close to that on the openness variable in the original equation (column 5). Once the investment rate and investment prices, which are likely to be endogenous, are taken out of the equation, the t-statistic on SQT drops to 1.30 and that on BM rises to 5.94 (column 6).

The comparability of the results in Table IV.1 is hampered by the fact that the sample size changes as we move from one column to the next. This is because not all of the 79 countries in the sample have data for each of the individual Sachs-Warner components. To check whether this introduces any difficulties for our interpretation, we have also run these regressions holding the sample size fixed. We restricted the sample to those countries which have the requisite data

for all the components, using both the original specification (n=71) and a specification where we drop two of the Sachs-Warner regressors with t-statistics below unity (primary schooling and revolutions and coups) to gain additional observations (n=74). In both cases, our results were similar to those reported above: Regardless of whether BM and SQT are entered separately or jointly, the coefficient on BM is highly significant (with a point estimate that is statistically indistinguishable from that on OPEN) while the coefficient on SQT is insignificant.²⁰

Hence, once BM is included, there is little additional predictive power coming from regime type (socialist or not), level of tariffs, or coverage of non-tariff barriers.²¹ The strength of the Sachs-Warner index derives from the low growth performance of countries with either high black market premia or state export monopolies (as classified by Sachs and Warner).²²

The reason why BM performs so much better than SQT is that BM generates a partition between closed and open economies that is much closer to that generated by OPEN than the partition generated by SQT. Only six economies are classified differently by BM when compared to OPEN, while OPEN and SQT disagree in 31 cases. The disagreement between OPEN and SQT is concentrated in 15 African and 12 Latin American economies which SQT fails to qualify as closed but BM (and therefore OPEN) does: the African economies are found to be closed because of their state monopolies of exports and those of Latin America because of

²⁰ The largest t-statistic we obtained for SQT in these runs is 1.4. These results are not shown to save space, but are available on request.

²¹ A different form in which the "horse race" can be run, suggested to us by Jeffrey Sachs, is to introduce OPEN and BM together in the regression, to see if OPEN clearly "wins." When we do this, we find that the point estimate of the coefficient on OPEN is generally larger than that on BM, but that the two coefficients are statistically indistinguishable from each other. The two coefficients cannot be distinguished statistically because OPEN and BM are highly collinear with each other (as we discuss further below). On the other hand, when OPEN and SQT are entered together, SQT has the wrong (negative) sign and the equality of coefficients can easily be rejected.

²² Harrison and Hanson (1999) have studied the Sachs-Warner dummy and reach a similar conclusion, namely that the effect of trade policy indicators (tariffs and quotas) on the strength of the Sachs-Warner dummy is small and not significant. The key difference between our work and Harrison and Hanson's analysis is that they introduce the

their high levels of black market premia. The average rate of growth of these economies is 0.24, much lower than the sample average of 1.44.²³

In view of the overwhelming contribution of the black market premium and the dummy on state monopoly of exports to the statistical performance of the Sachs-Warner openness index, it is logical to ask what exactly it is that these two variables are capturing. To what extent are they indicators of trade policy? Could they be correlated with other variables that have a detrimental effect on growth, therefore not giving us much useful information on trade openness per se? We turn now to these questions, first with an analysis of the state monopoly of exports variable, and then with a discussion of the black market premium variable.

What does the State Monopoly of Exports variable represent?

Sachs and Warner's rationale for using an indicator of the existence of a state monopoly on major exports is the well-known equivalence between import and export taxes (Lerner 1936). The MON variable is meant to capture cases in which governments taxed major exports and therefore reduced the level of trade (exports and imports). Sachs and Warner use an index of the degree of distortions caused by export marketing boards, taken from the World Bank study Adjustment in Africa: Reforms, Results, and the Road Ahead (World Bank 1994).²⁴

subcomponents of the Sachs-Warner index separately in their regression whereas we construct the sub-indexes described in the text.

²³ Our result is not due to an arbitrary distinction between BM and SQT. SQT performs more poorly than any other openness index constructed on the basis of three of the five indicators used by Sachs and Warner, and BM performs more strongly than any index constructed with two of these five indicators. A similar result applies to partitions along other dimensions: those constructed using four indicators which exclude either BMP or MON do more poorly than any of those which include them; and either BMP or MON individually do better than any of the other indicators. Details of these exercises can be found in the working paper version of our paper (Rodríguez and Rodrik 1999)

²⁴ Sachs and Warner (1995) cite a different source in their paper, but World Bank (1994) appears to be the correct source.

We note that the World Bank study covers only 29 African economies that were under structural adjustment programs from 1987 to 1991. This results in a double selection bias. First, non-African economies with restrictive policies towards exports automatically escape scrutiny. Second, African economies with restrictive export policies but not undergoing adjustment programs in the late 1980s are also overlooked. Since Africa was the slowest growing region during the period covered and economies that need to carry out structural adjustment programs are likely to be doing worse than those that do not, the effect is to bias the coefficient on openness upwards on both accounts.

How this selection bias affects the country classification can be illustrated by two examples: Indonesia and Mauritius. Both of these economies are rated as open in the Sachs-Warner sample. Both are excluded from the sample used to construct the state monopoly on exports variable: Indonesia because it is not in Africa, and Mauritius because it was doing well and was not undergoing a World Bank adjustment program during the period covered by the World Bank study. Yet both of these economies would seem to satisfy the conditions necessary to be rated as closed according to the export monopoly criterion: Indonesian law restricts oil and gas production to the state oil company, PERTAMINA, and Mauritius sells all of its export sugar production through the Mauritius Sugar Syndicate.²⁵ Indonesia and Mauritius are also among the ten fastest growing economies in the Sachs-Warner sample.

²⁵ See Pertamina (1998) for Indonesia and Gulhati and Nahari (1990, 22) as well as World Bank (1989, 6) for Mauritius. Oil represented 61.2 % of Indonesian exports and sugar represented between 60-80% of Mauritius exports during the period covered by the Sachs-Warner study (see World Bank 1983, Table E, and 1998). Although manufactures have recently outstripped sugar as Mauritius's main export, this is a recent development: in 1980 sugar represented 65% of Mauritius's total exports and agriculture was surpassed by manufacturing as the main source of exports only in 1986 (World Bank 1998).

One of the problems that this selection bias causes in the Sachs-Warner estimation is that it makes the MON variable virtually indistinguishable from a sub-Saharan Africa dummy.²⁶ There are 13 African countries (out of 47) in the Sachs-Warner study that are not rated as closed according to MON. (Twelve of these were not included in World Bank study.) But for all but one of these observations MON adds no additional information, either because they are dropped from the sample due to unavailability of other data or because they are rated as closed by other trade policy indicators used to construct the index. The result is that the only difference between having used an export marketing board variable to construct the Sachs-Warner index and having used a sub-Saharan Africa dummy is a single observation. That observation is Mauritius, the fastest growing African economy in the sample.²⁷

We conclude that the export marketing board variable, as implemented, is not a good measure of trade policy and creates a serious bias in the estimation. Except for Mauritius, whose classification as open seems to us to be due exclusively to selection bias, the inclusion of MON in the Sachs-Warner dummy is indistinguishable from the use of a Sub-Saharan Africa dummy. In that respect, the only information that we can extract from it is that African economies have grown more slowly than the rest of the world during the seventies and eighties.

What does the Black Market Premium variable measure?

The second source of strength in the Sachs-Warner openness variable is the black market premium. Indeed, the simple correlation between the openness dummy and BMP is 0.63. A

²⁶ This is true despite the fact that the Sachs-Warner dummy's coefficient is still significant after the estimation is carried out controlling for a Sub-Saharan Africa dummy. The reason is that the SW dummy still has substantial explanatory power left due to its use of the Black Market Premium variable.

²⁷ Both Lesotho and Botswana had higher growth rates than Mauritius but Lesotho was not rated due to insufficient data (Sachs and Warner 1995, 85) and Botswana is dropped from their sample because of unavailability of government consumption data.

regression of growth on the black market premium dummy and all the other controls gives a coefficient of -1.05 with a t-statistic of nearly 2.5 in absolute value. How good an indicator of openness is the black market premium?

The black market premium measures the extent of rationing in the market for foreign currency. The theoretical argument for using the black market premium in this context is that, under certain conditions, foreign exchange restrictions act as a trade barrier. Using our notation from the previous section (but omitting country subscripts), the domestic price of import-competing goods relative to exportables can be expressed as follows:

$$\frac{p^m}{p^x} = \frac{e^m p^{m*} (1+t^m)(1+t^x)}{e^x p^{x*}}$$

where an asterisk refers to border prices. We now allow for the possibility that the exchange rates applicable to import and export transactions (e^m and e^x , respectively) can differ. Foreign currency rationing can drive a wedge between these two exchange rates.

Suppose the form that rationing takes is as follows: all imports are financed at the margin by buying foreign currency in the black market, while all export receipts are handed to the central bank at the official exchange rate. In this case, $e^m/e^x = (1+BMP)$, and the presence of a black market premium has the same resource-allocation consequences as a trade restriction. On the other hand, if at the margin exporters can sell their foreign-currency receipts on the black market as well, then the wedge between e^m and e^x disappears. In this case, the black-market premium does not work like a trade restriction.²⁸ Neither does it do so when the premium for foreign currency is generated by restrictions on capital-account (as opposed to current-account) transactions.

But there is a deeper problem with interpreting the black-market premium as an indicator of trade policy. Sachs and Warner rate an economy closed according to BMP if it maintains black market premia in excess of 20 percent for a whole decade (the 1970s or the 1980s). Such levels of the black market premium are indicative of sustained macroeconomic imbalances. Overvaluation of this magnitude is likely to emerge (i) when there is a deep inconsistency between domestic aggregate demand policies and exchange rate policy, or (ii) when the government tries to maintain a low level of the exchange rate in order to counteract transitory confidence or balance of payments crises. Such imbalances may be sparked by political conflicts, external shocks, or sheer mismanagement, and would typically manifest themselves in inflationary pressures, high and growing levels of external debt, and a stop-go pattern of policy-making. In addition, since black market premia tend to favor government officials who can trade exchange rate allocations for bribes, we would expect them to be high wherever there are high levels of corruption. Therefore, countries with greater corruption, a less reliable bureaucracy, and lower capacity for enforcement of the rule of law are also likely have higher black market premia.

Hence it is reasonable to suppose that the existence of sizable black market premia over long periods of time reflects a wide range of policy failures. It is also reasonable to think that these failures will be responsible for low growth. What is more debatable, in our view, is the attribution of the adverse growth consequences exclusively to the trade-restrictive effects of black market premia.

Many of the relationships just discussed are present in the data. The simple correlations of black market premia with the level of inflation, the debt/exports ratio, wars and institutional

²⁸ In one respect, Sachs and Warner (1995) treat BMP differently from a trade restriction: the cutoff for tariffs (TAR) is set at 40 percent while that for BMP is set at 20 percent.

quality are all sufficiently high to warrant preoccupation. Indeed, of the 48 economies ranked as closed according to the BMP criteria, 40 had one or more of the following characteristics: average inflation over 1975-1990 higher than 10 percent, debt to GNP ratio in 1985 greater than 125 percent, a terms-of-trade decline of more than 20 percent, an institutional quality index less than 5 (on a scale of 1 to 10), or involvement in a war.

We also view the fact that there exist important threshold effects in the black market premium as indicative that this variable may simply be capturing the effect of widespread macroeconomic and political crises. If we insert the black market premium in the 1970s and 1980s as continuous variables in the regression, the estimated coefficients are extremely weak and they fail to pass an F-test for joint significance at 10 percent. The strength of the Sachs-Warner result comes in great part from the dichotomous nature of the BMP variable and from the fact that the 20 percent threshold allows more weight to be placed on the observations for which the black market premia--and probably also the underlying macroeconomic imbalances--are sufficiently high.

That the effect of the black market premium is highly sensitive to the macroeconomic and political variables that one controls for is shown in Table IV.2, where we present the results of controlling for each of the indicators of macroeconomic and political distress that we have mentioned. In three out of 5 cases, each one of these variables individually is enough to drive the coefficient on BMP below conventional levels of significance. If we insert all our controls together, the estimated coefficient on BMP goes down by more than half and the t-statistic drops below 1.

This kind of evidence does not by itself prove that higher black market premia are unrelated to growth performance. The results in Table IV.6 can be due to high multicollinearity

between the black market premium and the indicators of macroeconomic and political distress that we have chosen. But what they do show is that there is very little in the data to help us distinguish the effect of high black market premia from those of other plausible right-hand side variables relating to macroeconomic distress. In other words, they show that the black market premium is not a good measure of trade policy, because it is also a proxy for many other variables unrelated to trade policy.

Sensitivity and General Implications

The interpretational problems with the State Monopoly of Exports and Black Market Premium variables would not be so important if these two variables were responsible for only part of the effect of the Sachs-Warner index on growth. But the fact that they seem to be its overwhelming determinant makes us worry about the extent to which the results speak meaningfully about the role of trade policies.

The arguments in the previous two sections have shown that the individual coefficients on MON and BMP are not very robust to controlling for variables such as an Africa dummy or indicators of macroeconomic and political distress. However, much of the force of the Sachs-Warner variable comes from its combination of the effects of MON and BMP. The reason is that the Sachs-Warner dummy uses MON to classify as closed all but one of the economies in Sub-Saharan Africa and then uses BMP to classify as closed a set of economies with macroeconomic and political difficulties. It thus builds a “super variable” which is 1 for all non-African economies without macroeconomic or political difficulties. This variable will be statistically

stronger than either an Africa dummy or macroeconomic controls because it jointly groups information from both.²⁹

In the working paper version of this paper (Rodríguez and Rodrik 1999) we show that the coefficient on the Sachs-Warner variable, although generally robust to changes in the list of controls, is particularly sensitive to the inclusion of other summary indicators of macroeconomic and political crises. In particular, both the summary indicator of institutional quality developed by Keefer and Knack (1995) as well as a dummy variable that captures the effect of being in Africa and high macroeconomic disequilibria can easily drive the coefficient of the SW dummy below conventional significance levels. This sensitivity is important not because it shows the existence of a specification in which the SW dummy's significance is not robust, but because this lack of robustness shows up precisely when it is other indicators of political and macroeconomic imbalances that are introduced in the regression. This appears to suggest that the SW variable may be acting as a proxy for these imbalances rather than as an indicator of trade policy.

We do not pretend to have a good answer to the question of whether it is macroeconomic and political distress that drive trade policy or the other way around.³⁰ Nor do we give an answer to the question of whether all of these are determined in turn by some other underlying variables such as poor institutions or anti-market ideology. What we believe we have established is that the statistical power of the Sachs-Warner indicator derives not from the direct indicators of trade policy it incorporates, but from two components that we have reasons to believe will yield

²⁹ If MON and BMP are inserted separately, together with an Africa dummy and a measure of institutional quality, neither MON nor BMP are individually significant and the p-value for a joint significance test is 0.09. (.31 after controlling for NTB, TAR and SOC), but OPEN gets a t-statistic of 3.06 and BM one of 2.93 (SQT gets 1.46).

³⁰ The Sachs-Warner view is that causality goes from restrictive trade policies to macroeconomic instability (personal communication with Sachs). For the purposes of the present paper, we are agnostic about the existence or direction of any causality. An argument that macroeconomic imbalances are largely unrelated to trade policies is not difficult to make, and receives considerable support from cross-national evidence (see Rodrik 1999, chap. 4).

upwardly biased estimates of the effects of trade restrictions. The Sachs-Warner measure is so correlated with plausible groupings of alternative explanatory variables--macroeconomic instability, poor institutions, location in Africa--that it is risky to draw strong inferences about the effect of openness on growth based on its coefficient in a growth regression.

V. Sebastian Edwards (1998)

The third paper that we discuss is Sebastian Edward's recent *Economic Journal* paper "Openness, Productivity and Growth: What Do We Really Know?" (Edwards 1998). The papers by Dollar and by Sachs and Warner deal with data problems by constructing new openness indicators. Edwards takes the alternative approach of analyzing the robustness of the openness-growth relationship to the use of different existing indicators. Edwards writes: "the difficulties in defining satisfactory summary indexes suggest that researchers should move away from this area, and should instead concentrate on determining whether econometric results are robust to alternative indexes" (1998, 386). The presumption is that the imperfections in specific indicators would not seem quite as relevant if the estimated positive coefficient on openness is found to be robust to differences in the way openness is measured.

To carry out this robustness analysis, Edwards runs regressions of total factor productivity growth on nine alternative indicators of openness. (Initial income and a measure of schooling are used as controls).³¹ His estimates of total factor productivity growth are the Solow residuals from panel regressions of growth on changes of capital and labor inputs. The nine indicators of openness he uses are: (i) the Sachs-Warner openness index; (ii) the World Bank's

³¹ In an earlier and heavily cited paper, Edwards (1992) carried out a similar analysis for growth rates of real GDP per capita using a somewhat different set of nine alternative indicators of trade policy distortions. We focus here on Edwards (1998) because it is more recent and the data set used in the earlier paper was not available.

subjective classification of trade strategies in *World Development Report 1987*; (iii) Edward Leamer's (1988) openness index, built on the basis of the average residuals from regressions of trade flows; (iv) the average black market premium; (v) the average import tariffs from UNCTAD via Barro and Lee (1994); (vi) the average coverage of non-tariff barriers, also from UNCTAD via Barro and Lee (1994); (vii) the subjective Heritage Foundation index of Distortions in International Trade; (viii) the ratio of total revenues on trade taxes (exports + imports) to total trade; and (ix) Holger Wolf's regression-based index of import distortions for 1985.

The results Edwards presents are weighted least squares (WLS) regressions of TFP growth on (i)-(ix), where the weighting variable is GDP per capita in 1985. They are shown in column 1, rows 1-9, of Table V.1: six of the nine indicators are significant and all but one have the expected sign. He repeats the analysis using instrumental weighted least squares (column 2), and finds 5 of 9 indicators significant at 10% (3 at 5%) and all having the "correct" sign.³² He also builds an additional indicator as the first principal component of (i), (iv), (v), (vi) and (ix), which he finds to be significant in WLS estimation (row 10). He concludes that "these results are quite remarkable, suggesting with tremendous consistency that there is a significantly positive relationship between openness and productivity growth."

We will argue that Edwards' evidence does not warrant such strong claims. The robustness of the regression results, we will show, is largely an artifact of weighting and identification assumptions that seem to us to be inappropriate. Of the 19 different specifications reported in Edwards (1998), only 3 produce results that are statistically significant at

³² In his paper, Edwards erroneously claims that two additional variables are significant in the IV-2SLS estimation: Leamer's index and Tariffs. This mistake was apparently due to two typographical errors in his Table 4, p. 393.

conventional levels once we qualify these assumptions. Furthermore, the specifications that pass econometric scrutiny are based on data that suffer from serious anomalies and subjectivity bias.

The problem with weighting

The justification for the resort to weighted least squares estimation is not provided in the paper, but it is presumably to correct for possible heteroskedasticity in the residuals. If disturbances are not homoskedastic, ordinary least squares estimates will be inefficient. If the form of the skedastic function is known, then it is appropriate to use weighted least squares. This is indeed what Edwards implicitly assumes when he uses GDP per capita as his weighting variable. If it is unknown, White's (1980) covariance matrix estimator allows for the calculation of heteroskedasticity-robust standard errors that are invariant to the form of the skedastic function.

When there is heteroskedasticity, the standard deviation of the disturbance in the growth equation varies systematically across countries. Edward's decision to weight his observations by the level of GDP per capita implies an assumption that the standard deviation of the disturbances in the growth equation is inversely proportional to the square root of the level of GDP per capita in 1985. In other words, if the United States is--as it in effect was in 1985 according to the Summers-Heston data--59 times wealthier than Ethiopia, the standard deviation of the growth rate conditional on having the United States' income is $7.7 (59^{1/2})$ times higher than conditional on having Ethiopia's income. Using the estimates of the residuals' standard deviation from one of the Edwards equations, we can calculate the implied root mean squared error of the growth rate conditional on having the incomes of the United States and of Ethiopia. The former is .8 percentage points, whereas the latter is 6 percentage points. It may be reasonable to suppose that

growth data for poor countries are less reliable than that for rich countries, but the errors implied by Edwards' weighting assumption for poor countries' growth data seem to us to be unreasonably high. As a matter of fact, it is hard to think of a reason to be doing regression analysis on a broad cross-section of primarily poor countries if we believe that underdeveloped nations' economic data are this uninformative.

Columns 3 and 4 of Table V.1 repeat Edwards' regressions using the natural log of 1985 per capita GDP as the weighting variable. In terms of our calculations above, the ratio between the US and Ethiopian standard deviations would now be a more reasonable 1.31. This set of regressions results in six of the eighteen coefficients having the "wrong" sign. Five out of nine coefficients are significant among the least squares regressions (four at 5%), and two out of nine in the instrumental variables regressions. The coefficient on the principal components variable now becomes insignificant.³³

One way to put aside doubts about the appropriateness of alternative assumptions regarding the nature of the skedastic function is to use White's (1980) heteroskedasticity-consistent standard errors, which are robust to the form of heteroskedasticity. We show these estimates in column 5 and 6 of Table V.1. Four out of nine coefficients are now significant among the least squares regressions (three at 5%) and two out of nine among the IV regressions.

³³ Why does weighting by GDP give such different results? The reason seems to be that there is a relationship between the openness indices used by Edwards and TFP growth at high levels of income. This relationship in itself is apparently driven by the fact that the great majority of economies with restrictive trade practices and high levels of GDP per capita in 1985 were oil exporters. Because of their high incomes, these economies are weighted very heavily in the WLS regressions. It is well-known that oil exporting economies had very low rates of growth during the 1980s (see for example the studies in Gelb, 1988). If one redoes regressions 1-19 using GDP per capita weights but including a dummy for oil exporters one gets very similar results to those in column 3 of Tables 1 and 2: only the coefficients for the World Development Report Index (equations 2,12), the Heritage Foundation Index (equations 7,17) and the least squares estimate of the collected taxes ratio (equation 8) remain significant, and the least squares coefficient on quotas changes sign.

Only twelve of the eighteen coefficients have the correct sign. The principal components variable is also insignificant.

The problem with identification

The two significant IV coefficients in Table V.1 are moreover quite sensitive to the specification of the instrument lists. In particular, the IV versions of equations 2 and 7 in Table V.1 are two of the only three equations in which the Heritage Foundation Index of Property Rights Protection is used as an instrument by Edwards.³⁴ If this instrument is not excludable from the second stage regression, Edwards' IV estimation will give biased estimates of the coefficient of openness on growth. Theoretically, it seems to us unreasonable to assert that the protection of property rights can effectively be assumed not to be an important determinant of growth, given the extensive literature concerned precisely with such an effect.³⁵ In Table V.2, columns 1-4, we show that, if property rights are included in the second-stage regression for these two equations, this term gets a significant coefficient in equation 2 (World Development Report Index) and a positive albeit insignificant coefficient in Equation 7 (Heritage Foundation Index). Chi-squared tests of the overidentifying restrictions also reject the null hypothesis that these restrictions hold for equation 2. Furthermore, in both equations the t-statistic on the openness proxy falls to well below .5 in absolute value.

If we take seriously the fact that property rights are not excludable from the productivity growth regressions, we are left with the conclusion that, among 19 different specifications, we

³⁴ His other instruments include: TFP growth in the 1970s and the black market premium, export/GDP, import/GDP and terms of trade changes for the 1975-79 period.

³⁵ Barro (1997) names "the importance of institutions that ensure property rights and free markets," for economic growth as one of the "dominant themes" of his recent research (p. xiv). For examples of the literature emphasizing the importance of property rights for economic growth, see Clague, Knack, Keefer, and Olson (1996), Acheson and McFetridge (1996), Jodha (1996), Tornell (1997), Park and Ginarte (1997) and Grossman and Kim (1996).

find evidence of a negative and statistically significant correlation between trade-restricting policies and productivity growth in only 3 cases. Those are the ones that use the Collected Taxes Ratio, the World Development Report Index, or the Heritage Foundation Index. We take up some problems with these indices in the next subsection.

Data issues

Edwards reports that the Collected Taxes Ratio (which measures trade tax revenue as a proportion of total trade) is calculated from raw data provided by the IMF. We are puzzled by this data because many of the numbers for developing countries are implausible. India, a country with one of the world's highest tariff rates, is listed as having an average ratio of 2.4 percent, lower than the sample average and barely above the value for Chile (2.3 percent). The mean value of the Collected Taxes Ratio in the sample is 2.8 percent, which strikes us as very low.

We have attempted to replicate Edwards' results using data from the World Bank's World Development Indicators (1988). This source, which was not available at the time the Edwards analysis was first conducted, provides collected trade tax ratios for imports and exports separately, which we have combined to derive an index in the spirit of Edwards' variable.³⁶ According to this index, India's average trade tax is 37.3 percent (a more plausible figure than Edwards' 2.4 percent). We replicate equation 8 of Table V.1 with this data, and the results are shown in columns 6-8 of Table V.2. The coefficient on average duties is now insignificant and has the "wrong" sign (column 6). If we introduce import and export duties separately (column

³⁶ As our earlier discussion showed, when imports and exports are both taxed, their distortionary effect is multiplicative rather than additive. So instead of summing import and export taxes, we use the formula $(1+mdut)x(1+xdut) - 1$, where $mdut$ ($xdut$) is import (export) duties as a percent of imports (exports). We take the average of observations for 1980-85. Our results (on the sign and insignificance of the coefficient on trade taxes) are unchanged, however, when we take the simple sum $mdut + xdut$.

7), import duties in fact get a positive and significant coefficient (contrary to the expected negative coefficient) and export duties are insignificant. One shortcoming of these specifications (including Edwards') is the small sample size (between 43 and 45). Since export duties are not reported for many countries, one way of increasing the sample size is to introduce only the import duty variable from the World Development Indicators database. This increases the sample size to 66 countries. The estimated coefficient on import duties is once again positive and insignificant (column 8).

These results are in line with others we have reported earlier: there is little evidence that simple averages of trade taxes are significantly and negatively correlated with growth.

The other two variables that are significant are the subjective indexes constructed by the World Bank and the Heritage Foundation. It is striking that two subjective indexes are the only variables that are robust to our econometric analysis, since subjective indexes are well known to suffer from judgment biases. Indeed, a look at the two indexes reveals some striking contrasts. In the Heritage Foundation Index, for example, Chile and Uganda are in the same category (4 on a scale of 1 to 5, where 5 is most protected). Perhaps even more problematic is the fact that the Heritage Foundation index rates policies in 1996, well after the end of Edward's sample period (1980-1990). Similar problems are present in the World Bank index, where high-growth Korea is rated as more open than moderate-growth Malaysia despite having higher tariff rates and non-tariff barrier coverage as well as a lower export/GDP ratio, and moderate-growth Tunisia -- which had average tariffs of 21% and average non-tariff coverage of 54% -- is classified in the same group as Chile, Malaysia and Thailand. In fact, in his 1993 literature review, Edwards (1993, 1386-1387) himself drew attention to serious problems with this index. As he noted, Chile, which in other studies is rated as the most open economy in the developing world, was

grouped in the second category (moderately outward oriented); Korea was classified in the group of most open economies for both the 1963-73 period and the 1973-85 period despite the fact that during 1963-73 the Korean trade regime was considerably more restrictive than in the latter subperiod.

In the working paper version of this paper we report the results of recomputing these subjective indices using the quantitative information on which the indices are purportedly based. Given that these underlying data are no different from that used in some of the other empirical work that we have discussed in this and other sections of the paper, it should come as no surprise that these attempts generally yielded insignificant coefficients. The natural conclusion from these results appears to be that either the mismatch in time periods, subjectivity biases, or both, are the fundamental causes for the significance of the Heritage Foundation and World Bank indices.

In sum, we do not concur with Edwards's assertion that the cross-country data reveal the existence of a robust relationship between openness and productivity or GDP growth.³⁷ In our view, there is little evidence to support such an assertion. The results reviewed in this section are for the most part highly dependent on questionable weighting and identification assumptions. The trade-policy indicators whose significance is not affected by these assumptions either are subjective indexes apparently highly contaminated by judgement biases or lack robustness to the use of more credible information from alternative data sources.

VI. Dan Ben-David (1993)

³⁷ Our results are basically unaltered if we use growth of GDP per capita from 1980 to 1990 instead of TFP growth as the dependent variable. In this case the World Bank and Heritage Foundation indexes remain significant but the Collected Trade Taxes Ratio is now only significant at a 10% level and the Black Market Premium is insignificant. Similar results emerge for instrumental variables estimation.

Dan Ben-David's (1993) *QJE* paper "Equalizing Exchange: Trade Liberalization and Income Convergence" takes an altogether different approach to studying the impact of openness on economic growth. Ben-David analyzes the effect of trade policies on income by asking whether trade liberalization leads to a reduction in the dispersion of income levels among liberalizing countries (i.e., whether it contributes to what has been called σ -convergence). We pick Ben-David as an example of a strand of the literature which has centered on studying the effect of trade on convergence. Another distinctive aspect of Ben-David's work is that it is non-parametric and not regression-based.

The expectation that trade liberalization might lead to income convergence is grounded in the factor price equalization (FPE) theorem. According to trade theory, free trade in goods leads to the equalization of factor prices under certain conditions (including an equal numbers of goods and factors, identical technologies, and absence of transport costs). As barriers to trade are relaxed (and assuming in addition that differences in capital-labor ratios and labor-force participation ratios do not countervail), a tendency towards FPE can be set into motion, resulting in convergence in per capita incomes.

There is no necessary relationship between the level of dispersion in incomes and the growth rate. Countries could in principle be converging to lower levels of GDP per capita. But in the case of the European Community, on which Ben-David concentrates, the convergence experienced was indeed to higher level of incomes. Overall growth from 1945 to 1994 of the EC5 (Belgium, France, the Netherlands, Italy, and Germany) was 3.45 percent, compared to 1.21 percent between 1900 and 1939 and 1.16% from 1870 to 1899. Therefore, if Ben-David's claim

is right, convergence in the EEC was achieved by raising the income of poor countries rather than by lowering that of rich countries.

Ben-David's argument goes beyond simply ascertaining that a decrease in dispersion occurred during the postwar era. He tries to show that trade liberalization caused this decrease by discarding other plausible alternatives. Thus he argues (i) that the observed convergence was not simply a continuation of a long-term convergence trend unrelated to postwar economic integration; (ii) that the European countries that chose not to enter a free-trade agreement did not experience the same levels of convergence as the EEC; (iii) and that other subsets of economies in the world which were not economically integrated did not experience convergence. We examine each of his arguments in turn.

Was European convergence a continuation of a long-term trend?

In support of the argument that the reduction in dispersion was not simply the continuation of a long-run trend, Ben-David argues that the series of per capita income dispersion (solid line in Figure VI.1) does not show any visible downward tendency before the postwar era. When presenting this series, Ben-David excludes Germany from the calculations,³⁸ arguing that not doing so would bias the conclusion in favor of convergence:

Germany was always among the poorest, in per capita terms, of the six countries. Today, it is one of the wealthiest countries in Europe. As a result of its heightened prosperity, it might be claimed that all of the convergence that has been witnessed within the EEC is due to the behavior of Germany. Thus, its exclusion should bias the results away from convergence. (Ben-David 1993, 662)

³⁸ Luxembourg is also excluded because Maddison does not provide data for it.

Note however that the purpose of Figure VI.1 (Figure VII in Ben-David's paper) is not only to establish the existence of convergence following postwar liberalization, but also to establish the absence of a long-term trend in convergence pre-dating it. Thus the exclusion of Germany from the series, which biases the results against convergence, would also bias the results in favor of the hypothesis that there was no pre-war convergence trend, had Germany's convergence occurred before the post-war period.

That is indeed what happened. Between 1870 and the eve of World War II, Germany's income went from less than 50% to 75% of the average for the remaining members of the EEC. And by 1958, one year after the EEC was formed, Germany had surpassed Belgium as the leader of the five. The exclusion of Germany therefore has the effect of understating the fall in dispersion before the creation of the EEC. The dashed line in Figure VI.1, which calculates dispersion of log per capita incomes including Germany, shows this. Once Germany is included in the sample, it appears that dispersion has been on a downward trend since 1870. The hypothesis that postwar convergence was simply a continuation of a long-term trend can no longer be rejected easily, raising doubts about the conclusion that convergence was caused by postwar trade policies.³⁹

Figure VI.2 plots the standard deviation of log incomes for the original members of the EEC, now using Maddison's more recent (1995) estimates and including Germany. We reach

³⁹ Ben-David (in personal communication) has pointed out to us that much of the pre-war convergence is due to the fact that "while the other countries were in the Depression, Germany surged ahead as Hitler built his war machine." Indeed, dispersion appears trendless from 1900 to 1932, and starts falling only as Germany's income rises during the National Socialist period. But we are not sure of what to make of that fact. Germany's income remained high after the war--compared to other European countries--suggesting that not all of the convergence was due to the policies of the Nazi period or to the buildup of the war machine. In any case, Nazi Germany pursued highly protectionist policies, so that its experience sheds doubt on the argument that poor countries that close their economies experience slower growth. Finally, the observation for 1870 in Figure VI.1 suggests that dispersion was much higher in the late nineteenth century than in 1930. The last point is confirmed when we examine Maddison's (1995) more recent estimates (see Figure VI.2), which provide a fuller picture of trends in dispersion since 1820. These estimates were not available to Ben-David at the time his paper was written.

the same conclusion as in Figure VI.1: dispersion has followed a downward trend since the beginning of the 20th century. From a peak of 0.36 in 1897, dispersion had fallen to 0.25 in 1930, and 0.19 in 1939. By the time the EEC was created, it had fallen to 0.16. It appears therefore that the further reduction in dispersion that followed the creation of the EEC (to 0.06 by 1994) was a continuation of a long-term trend that predated European integration. Moreover, this conclusion is not sensitive to whether Germany is included in the sample: that is because Maddison's (1995) revised estimates suggest that there was a uniform pattern of convergence during the pre-World War I period, with Italy, France, and Germany all catching up with Belgium and the Netherlands.

A closer look at Figure VI.2 suggests that there is in fact very little association between episodes of economic integration and σ -convergence over time. The period leading up to 1878 was an era of continuous trade liberalization, at the level of both national markets and international ones. This period witnessed the creation of the German *Zollverein* (1833) and the unification of Italy (1860), as well as the signing of free trade agreements between Prussia and Belgium (1844), France and Belgium (1842), France and Prussia (1862), France and Italy (1863), and France and the Netherlands (1865).⁴⁰ Most of these bilateral agreements had most favored nation clauses, extending the benefits of bilateral liberalization to third countries. Yet,

⁴⁰ The discussion in this and the following two paragraphs borrows heavily from Chapter V of Pollard (1974). Above we list treaties between countries included in Figure VI.2, but the extent of trade liberalization from 1820 to 1878 in Europe was impressive. Prussia signed free trade treaties with Britain (1841 and 1860), Turkey (1839), Greece (1840), Austria (1868), Spain (1868), Switzerland (1869), Mexico (1869) and Japan (1869), France with Britain (1860), Switzerland (1864), Sweden, Norway, the Hanse Towns and Spain (1865), Austria (1866) and Portugal (1867), Belgium with Britain (1862), Italy with Britain (1862), Turkey and Greece (1839-40). Aside from the MFN clause, measures were taken to ease international trade such as the inclusion in the Treaties of Berlin of clauses extending commercial freedoms to foreign citizens (1878, 1885). There were even attempts to create customs unions between France and Germany and France and its neighbors.

despite increasing economic integration, dispersion more than doubled from 1820 to 1880 (from 0.14 to 0.29).⁴¹

The retreat from free trade started during the 1880s, with Germany's Tariff Act of 1879. Italy raised tariffs in 1878 and 1887, France in 1881 and 1892.⁴² This rise in protection followed the depression of the 1870s and was motivated by the desire to protect European farmers from the influx of cheap American grain imports (which began to undersell German grain in 1875) while at the same time compensating industry for the increased wages of their workers.⁴³ Nevertheless, as Figure VI.2 shows, the period from the 1880s to World War I was, if anything, one of convergence.⁴⁴

The breakdown in world trade that followed World War I and the spread of beggar-thy-neighbor protectionist policies adopted during the great depression seem also to have had very little effect on dispersion. Even though fascist governments in Italy and Germany raised agricultural tariffs and other protectionist barriers, and in France the power of agricultural groups was high enough to drive the French price of wheat in 1939 to three times its price in London (Cobban 1965, 156), on the eve of World War II dispersion stood at its lowest level since the 1860s.

⁴¹ A caveat applies here: for the 1820-1850 period, we rely on just two observations: one for 1820, and another one for 1850. Since the 1850 observation for Italy was not available, we constructed it as the result of a linear interpolation between the 1820 and the 1870 observation. Even if we disregard the evidence before 1870, the yearly data from 1870-1880 indicate that the increase in dispersion predated the first protectionist measures.

⁴² Again, tariff adoption was widespread, with only Holland and the United Kingdom resisting the reversion towards protectionism.

⁴³ In effect, high tariffs worked to the detriment of labor in what came to be known in Germany as the "compact of rye and iron." See Gerschenkron (1943) and Rogowski (1989) for detailed discussions of this era. As Rogowski points out, the reversion towards protectionism was more accentuated in capital poor countries such as Germany, Italy and France than in capital rich countries such as Belgium and the Netherlands.

⁴⁴ O'Rourke's (1997) econometric study of this period (1875-1914), covering a panel of 10 countries, finds that higher tariffs were correlated with faster economic growth, and that the estimated effects are quantitatively large.

In sum, Figure VI.2 shows no long-run tendency for trade liberalization to be associated with greater convergence in per-capita incomes. If anything, it shows increasing dispersion during the 19th century and falling dispersion during the 20th century. While one can interpret this evidence in different ways, we find the most straightforward reading to be that World War II convergence was in fact a continuation of a long-run trend that got started around the turn of the 20th century.

Did non-EEC European countries experience convergence?

Ben-David also claims that countries in Europe that did not undertake trade liberalization failed to experience convergence. He supports his argument by showing that (a) there was no convergence among the UK, Denmark and Ireland until they began to relax their trade restrictions vis-à-vis Europe, and that (b) EFTA countries experienced significant convergence with the EEC as trade barriers among them were liberalized.

To demonstrate (a), Ben-David plots the standard deviation among the UK, Denmark and Ireland, both of which started liberalizing trade with the EEC in the mid-1960s. He shows that their dispersion among themselves started falling only after 1965. It is not clear to us why this is the relevant test, since the trade liberalization in question took place between these countries and Europe as well as amongst themselves. In Figure VI.3, we show that even if there is an indication of convergence among these three countries after 1965, it is not caused by convergence to the mean income of EEC members. Ireland has shown very little convergence to the EEC until recent years, and Denmark has oscillated close to the EEC average since the 1950s. The UK has been converging--downward--to the EEC level steadily (at least) since the

1950s. None of the three countries seem to experience different patterns of convergence after they relaxed trade restrictions with the EEC in 1965.

As regards (b), there has indeed been substantial convergence by EEC and EFTA member countries to the European mean since the 1950s. But we are skeptical whether such convergence can be attributed to trade liberalization. In Figure VI.4, we plot the contribution to the variance around the European mean⁴⁵ of three subsets of European countries: the six members of the European Economic Community, the seven members of the European Free Trade Association,⁴⁶ and six remaining European countries which did not join either EFTA or the EEC.⁴⁷ It is evident from Figure VI.5 that all subgroups have experienced substantial convergence. The non-EFTA and non-EEC countries have seen their contribution to the variance around the European mean fall from 0.085 to 0.034 from 1950 to 1992.⁴⁸ European convergence seems to be the result of factors largely unrelated to trade liberalization.

Did other areas of the world experience convergence?

⁴⁵ This is defined as:

$$\frac{1}{N_{EUROPE}} \sum_{i \in J} \left(\frac{y_i - \bar{y}_{EUROPE}}{\bar{y}_{EUROPE}} \right)^2 \text{ for } J = \{\text{EEC6, EFTA6, Others}\}.$$

Normalization by the mean achieves the same purpose as calculating the variance of log incomes--and is more appropriate for large income differences--and putting the expression in terms of the variance--and not the standard deviation--ensures that the three components sum to the total.

⁴⁶ Austria, Switzerland, Sweden, Denmark, Norway, Finland and the United Kingdom. Even though Portugal was officially a member of EFTA, it was allowed to implement tariffs and to deviate from EFTA policies, so we follow Ben-David in treating it as a non-EFTA country.

⁴⁷ Cyprus, Greece, Iceland, Ireland, Portugal and Spain.

⁴⁸ If one includes Turkey as a seventh country in this group the contribution to dispersion goes from 0.103 in 1950 to 0.053 in 1992. An alternative measure of dispersion around the European mean is the standard deviation of log incomes around the mean log income. The latter measure for the non-EEC, non-EFTA countries falls from 0.15 in 1950 to 0.05 in 1990 (0.20 to 0.10 if Turkey is included).

To add plausibility to the story that trade liberalization was behind the European trend towards convergence in the postwar era, Ben-David shows that subsets of countries that have not become integrated have experienced no tendency to converge. He points to the well-known fact that the dispersion of world incomes has not decreased in the postwar era (it has actually increased). He also shows that the dispersion of incomes among the world's 25 richest countries (excluding the EEC6) has not decreased either. He compares these experiences with those of economically integrated Europe and U.S. states to show that convergence seems to occur only when there is substantial trade liberalization.

There is an asymmetry in his selection of diverging and converging areas, however. Whereas the regions he shows to be converging are all close to each other geographically, those which are diverging are not. To have a fair standard of comparison, one must ask whether trade liberalization--or its absence--among geographically adjacent economies would lead towards convergence or divergence.

Did subsets of geographically adjacent economies that liberalized trade tend to observe convergence? There are at least two important cases in which the trends in convergence go counter to what we would expect on the basis of Ben-David's argument. Consider the experiences of East Asia and Latin America, two regions with radically different trade policies and which constitute the canonical examples of open and closed economies. If the liberalization-convergence view is right, the relatively open East Asian economies should have converged, whereas the relatively closed Latin American economies should have diverged. In fact, countries in East Asia have steadily diverged since the 1960s, with the standard deviation of their log

incomes going from 0.47 in 1960 to 0.81 in 1989.⁴⁹ As for Latin America, there has been a steady decrease in dispersion during the period of import substitution, from 0.55 before the Great Depression to 0.20 in the late 1980s.⁵⁰ More striking, dispersion has sharply risen since the late 1980s, just as Latin American countries liberalized their trade. (See Rodríguez and Rodrik 1999 for more details.)

Another important counter-example comes from the historical experience of the United States. Figure VI.5 plots the ratio of U.S. GDP per capita to the average GDP per capita for its three main European trading partners (the UK, France and Germany) up to 1938.⁵¹ Trade with Europe was approximately two-thirds of total U.S. trade during the nineteenth century,⁵² and the bulk of that was with these three countries. It is however evident from Figure VI.5 that despite declining levels of import duties, the U.S. and Europe steadily diverged between 1820 and 1938.

⁴⁹ The East Asian countries are Hong Kong, Indonesia, Japan, South Korea, Malaysia, Philippines, Singapore, Taiwan, and Thailand. Data are from Summers-Heston. If the Philippines is excluded, the rise in dispersion is from 0.50 to 0.73.

⁵⁰ The Latin American countries are Argentina, Brazil, Chile, Colombia, Mexico, and Peru. Data are from Maddison (1995), Summers and Heston (1994), and World Bank (1998). Latin American import substitution policies started rather spontaneously as a response to the collapse of world-wide demand for raw materials in 1929 and the adoption of protectionist measures by the U.S. and Britain in 1930 and 1931. Most countries abandoned convertibility and imposed trade barriers during this period and did not liberalize until recent years (see Díaz Alejandro 1981).

⁵¹ The cutoff date of 1938 is chosen because during World War II the Americas overtook Europe as the main destination for U.S. exports. The Americas overtook Europe as the main source of imports much earlier, during World War I. Including observations after 1940 would not change our results: U.S. GDP per capita in 1994 was still 27% higher than that of its three main European trading partners despite the fact that after 1944 tariff rates stayed well into the single digits (Bureau of the Census, 1989). Choosing the Americas instead of Europe as a standard of comparison would strengthen our results, as the divergence between U.S. and Latin American incomes during the 19th and 20th century has been extremely high (see Haber 1997) and Canada represents only about half of U.S. trade with the Americas.

⁵² Before World War II exports to Europe were 43% of total exports and imports from Europe were 29% of total imports (Bureau of the Census 1989).

Again, there seems to be no evident relationship between trade liberalization and income convergence.⁵³

We close by drawing attention to Slaughter's (forthcoming) recent examination of the same issue. Slaughter undertakes a systematic analysis by comparing convergence patterns among liberalizing countries before and after liberalization with the convergence pattern among randomly chosen control countries before and after liberalization. As he emphasizes, this difference-in-differences approach avoids the pitfalls of before-and-after comparisons (non-liberalizing countries too may exhibit the same pattern before and after) or of comparing liberalizing countries to non-liberalizing ones (the liberalizing countries may have been converging prior to the liberalization as well). Hence Slaughter's approach amounts to a more systematic version of the kind of exercise we have carried out above by way of specific illustrations (but using only post-World War II data). Slaughter focuses specifically on four instances of trade liberalization: formation of the EEC, formation of EFTA, liberalization between EEC and EFTA, and Kennedy Round tariff cuts under the GATT. His conclusion is that there is no systematic link between trade liberalization and convergence. In fact, he reports that much of the evidence suggests trade liberalization diverges incomes among liberalizers. This parallels our results above.

⁵³ Our broader conclusion is not necessarily inconsistent with Ben-David's own reading of the evidence. Ben-David (in personal communication) writes that the main conclusions that can be drawn from his research are that "trade liberalization is associated with income convergence only when (a) the liberalization is comprehensive and (b) the liberalization occurs between countries that trade extensively with each other," and that "there is no evidence that these outcomes hold for poor countries." In fact, Ben-David (1999) has argued that trade flows will be of little use in transferring knowledge to countries with low levels of human capital. This contrasts strongly with much of the discussion in the literature, which has interpreted Ben-David as making the much stronger claim that liberalization leads developing countries to converge with their richer trading partners. A few examples are IMF (1997, 84), World Bank (1996, 32), Vamvakidis (1996, 251) and Richardson et al. (1997, 100), all of which refer to Ben-David in discussions about developing economies.

VII. Jeffrey Frankel and David Romer (1999)

Frankel and Romer's (1999) very recent *AER* paper on trade and incomes has received considerable attention since its publication. This paper analyzes the relationship between trade and income by estimating cross-country regressions of income per capita on the trade-GDP ratio and two measures of country size (population and land area). The authors' aim is to address the problem of the likely endogeneity of trade with respect to income. So the trade-share is instrumented by first estimating a gravity equation, where bilateral trade flows are regressed on geographic characteristics (countries' size, distance from each other, whether they share a common border, and whether they are landlocked). The fitted trade values are then aggregated across partners to create an instrument for the actual trade share. An earlier version of the Frankel-Romer paper included initial income among the regressors in the second-stage equation, so that the results could also be given a growth interpretation. The main finding of the paper is that the IV estimate of the effect of trade on income is if anything greater than the OLS estimate.

As we mentioned in the introduction, this paper is concerned with the relationship between incomes and the volume of trade, and does not have immediate implications for trade policy. The reason is that the implications of geography-induced differences in trade, on the one hand, and policy-induced variations in trade, on the other, can be in principle quite different. Selective trade policies work as much by altering the structure of trade as they do by reducing the volume of trade. To the extent that policy is targeted on market failures, trade restrictions can augment incomes (or growth rates) even when indiscriminate barriers in the form of geographical constraints would be harmful. Of course, to the extent that selective trade policies are subject to rent-seeking, it is also possible that geography-induced variations in trade

underestimate the real costs of trade restrictions. Ultimately, whether on balance trade policies are used towards benign ends or malign ends is an empirical question, on which the Frankel-Romer paper is silent.

With regard to the role of trade flows proper, we are concerned that Frankel and Romer's geographically-constructed trade share may not be a valid instrument. The reason is that geography is likely to be a determinant of income through a multitude of channels, of which trade is (possibly) only one. Geography affects public health (and hence the quality of human capital) through exposure to various diseases. It influences the quality of institutions through the historical experience of colonialism, migrations, and wars. It determines the quantity and quality of natural endowments, including soil fertility, plant variety, and the abundance of minerals. The geographically-determined component of trade may be correlated with all these other factors, imparting an upward bias on the IV estimate unless these additional channels are explicitly controlled for in the income equation.

As there is a single instrument used in the Frankel-Romer regressions, conventional exclusion restriction tests performed conditional on a subset of the instruments being excludable from the second stage regression cannot be carried out. To check whether the Frankel-Romer result can be attributed to non-trade effects of geography, we simply test whether some summary statistics of the geographical factors influencing trade can be excluded from the second stage regression. We re-run the Frankel-Romer income regressions adding three summary indicators of geography: (i) distance from the equator (used in Hall and Jones 1998); (ii) the percentage of a country's land area that is in the tropics (from Radelet et al., 1997); and (iii) a set of regional dummies.

Table VII.1 shows the results. Columns 1 and 5 replicate Frankel and Romer's (1999) results in their Table 3, for the OLS and IV versions of the income equation, respectively. The other columns show the consequences of introducing the geography variables. The results are highly suggestive. The new variables enter with highly significant coefficients, indicating that they belong in the income equation. Moreover, once the additional geography variables are included, (a) the IV coefficient estimates on trade become statistically insignificant (with t-statistics around 0.4 or below), and (b) the IV point estimates on trade are reduced below their OLS counterparts. These findings are consistent with the hypothesis that non-trade effects of geography are the main driving force behind the findings of Frankel and Romer.⁵⁴

VIII. Other recent work

Before we close, we mention briefly some other recent papers that have examined the connection between openness and economic growth. We focus on three papers in particular: Lee (1993), Harrison (1996), and Wacziarg (1998). These papers are of interest because they contain some methodological innovations.

Lee (1993) reasons, on the basis of an analytical model, that the distortionary effects of trade restrictions should be larger in economies that, in the absence of trade restrictions, would be more exposed to trade. Hence he interacts an indicator of trade policy with a measure of what he calls "free trade openness" (*FREEOP*).⁵⁵ The latter is constructed by regressing observed import shares on land area, distance from major trading partners, import tariffs, and black-market

⁵⁴ We have carried out this exercise for various other samples (e.g., the higher-quality 98-country sample used by Frankel and Romer (1999), samples excluding possible outliers such as Luxembourg and Hong Kong) and reach identical conclusions.

⁵⁵ Specifically, the composite measure is constructed as $REETAR = FREEOP \cdot \log(1 + tariff)$.

premium, and then calculating the predicted value of imports when the actual values of tariffs black-market premia are replaced by zeros. He finds that this composite measure (*FREETAR*) enters a growth regression with an estimated coefficient that is negative and statistically significant.

Lee uses two indicators of trade policy: an import-weighted tariff average and the black-market premium. We have discussed above the shortcomings of the latter as a measure of trade policy (when reviewing Sachs and Warner, 1995). The problem with Lee's tariff variable, as Lee (1993, 320) acknowledges, is that the underlying tariff data are from "various years in the 1980s"--the tail-end of the 1960-85 period over which his growth regressions are run. This raises the possibility of reverse causation: countries that perform well tend to liberalize their trade regime eventually. To check for this possibility, we have repeated Lee's regression, using the same specification and tariff variable, but over the subsequent time period 1980-94.⁵⁶ While the estimated coefficient on *FREETAR* is negative for this later period, it is nowhere near significant (t-statistic = - 0.80).

Harrison's (1996) main methodological contribution is to examine the relationship between trade policy and growth in a panel setting, using fixed effects for countries. This approach has the advantage that it enables the analyst to look for evidence of the effects of trade liberalization within countries.⁵⁷ But it has the disadvantage that the available time series are necessarily short, requiring the use of annual data or (at most) five-year averages. It may be a lot

⁵⁶ Since Summers-Heston data are not available for the 1990s, we used World Bank data on GDP per capita (at constant prices).

⁵⁷ Harrison (1996) cites disappointing results with cross-section regressions as a motivation for going the panel route.

to ask such data to reveal much about the relationship between trade policy and growth, both because of the likely lags involved and the contamination from business-cycle effects.⁵⁸

Harrison uses seven indicators of trade policy, and finds that three of these "exhibit a robust relationship with GDP growth" (1996, 443). These three are the following: (a) the black-market premium; (b) a measure based on the price level of a country's tradables (relative to international prices); and (c) a subjective measure of trade liberalization constructed at the World Bank. We have already discussed at length the problems involved in interpreting measures of each of these types as indicators of trade policy.

Finally, the paper by Wacziarg (1998) is an ambitious attempt to uncover the channels through which openness affects economic growth. Wacziarg's index of trade policy is a linear combination of three indicators: (a) the average import duty rate; (b) the NTB coverage ratio; and (c) the Sachs-Warner indicator.⁵⁹ The weights used to construct the combined index come from a regression of trade volumes (as a share of GDP) on these three indicators plus some other determinants. Using a panel made up of five-year averages for 57 countries during 1970-89, Wacziarg finds that investment is the most important channel through which openness increases growth, accounting for more than sixty percent of the total effect.

We have two worries about this paper. First, we are not sure that the regularities revealed by the data over time horizons of five years or less are particularly informative about the relationship between trade policy and long-run economic performance. It would be interesting to

⁵⁸ Indeed, when Harrison (1996) controls for some business-cycle conditions, about half of her significant coefficients (on openness-related variables) disappear. The empirical evidence on the short-run relationship between trade liberalization and economic growth is judiciously reviewed in Greenaway et al. (1998), who point to both positive and negative findings. These authors attempt to trace out the dynamics of the output response using three different indicators of policy (including the Sachs-Warner index), and report finding a J-curve effect: output first falls and then increases.

⁵⁹ More specifically, Wacziarg uses the timing of trade liberalizations in Sachs and Warner (1995) to assign a value to each country for any given five-year period.

see if the results hold up with averages constructed over a decade or more. Second, as discussed previously, we are skeptical that the Sachs-Warner measure, on which the Wacziarg indicator is partly based, is a meaningful indicator of trade policy. Wacziarg remarks in a footnote (1998, fn. 9) that the “exclusion of [the Sachs-Warner indicator] from the trade policy index reduced the precision of the estimates ... but did not change the qualitative nature of the results.” We would have preferred to see estimates based only on tariff and NTB indicators.

IX. Concluding remarks

We have scrutinized in this paper the most prominent recent empirical studies on the relationship between trade barriers and economic growth. While we do not pretend to have undertaken an exhaustive survey, we believe that the weaknesses we have identified are endemic to this literature.

We emphasize that our difficulty with this literature is not a variant of the standard robustness criticism often leveled at cross-country growth empirics. Going back at least to Levine and Renelt (1992), a number of authors have pointed to the sensitivity of growth regressions to changes in the list of controls, and to the failure of these coefficients to pass the test of “extreme bounds analysis.” Whatever position one takes on this debate, the general point that we wish to make about the empirical literature on openness and growth is much simpler. For the most part, the strong results in this literature arise either from obvious mis-specification or from the use of measures of openness that are proxies for other policy or institutional variables that have an independent detrimental effect on growth. When we do point to the fragility of the coefficients, it is to make the point that the coefficients on the openness indicators are particularly sensitive to controls for these other policy and institutional variables. To the extent

that these objections can be conceptualized as variants of the robustness criticism, it is robustness at a much more basic level than that typically discussed in the Bayesian literature.

Still, in view of the voluminous research on the subject, a natural question that arises is whether we shouldn't take comfort from the fact that so many authors, using varying methods, have all arrived at the same conclusion? Don't we learn something from the cumulative evidence, even if individual papers have shortcomings?

We take a different message from this large literature. Had the negative relationship between trade restrictions and economic growth been convincingly demonstrated, we doubt that this issue would continue to generate so much empirical research. We interpret the persistent interest in this area as reflecting the worry that the existing approaches haven't gotten it "quite right." One indication of this is that the newer papers are habitually motivated by exegeses on the methodological shortcomings of prior work.

We are especially struck and puzzled by the proliferation of indices of trade restrictions. It is common to assert in this literature that simple trade-weighted tariff averages or non-tariff coverage ratios—which we believe to be the most direct indicators of trade restrictions—are misleading as indicators of the stance of trade policy. Yet we know of no papers that document the existence of serious biases in these direct indicators, much less establish that an alternative indicator "performs" better (in the relevant sense of calibrating the restrictiveness of trade regimes).⁶⁰ An examination of simple averages of taxes on imports and exports and NTB coverage ratios leaves us with the impression that these measures in fact do a decent job of rank-ordering countries according to the restrictiveness of their trade regimes. In the working paper version of this paper, we provide a simple measure of import duties for a large sample of

⁶⁰ Pritchett (1996) comes closest. The point of his paper, however, is to document the weak correlation between commonly used indicators of trade restrictions, and not to argue for the superiority of one indicator over the others.

countries and three different periods, so that the reader can form his/her judgement on this (Rodríguez and Rodrik, 1999, Table VIII.1).⁶¹

As we mentioned in the introduction, we are skeptical that there is a strong negative relationship in the data between trade barriers and economic growth, at least for levels of trade restrictions observed in practice.⁶² We view the search for such a relationship as futile. We think there are two other fruitful avenues for future research.

First, in cross-national work, it might be productive to look for contingent relationships between trade policy and growth. Do trade restrictions operate differently in low- versus high-income countries? In small versus large countries? In countries with a comparative advantage in primary products versus those with comparative advantage in manufactured goods? In periods of rapid expansion of world trade versus periods of stagnant trade? Further, it would help to disaggregate policies and to distinguish the possibly dissimilar effects of different types of trade policies (or of combinations thereof). Are tariff and non-tariff barriers to imports of capital goods more harmful to growth than other types of trade restrictions? Does the provision of duty-free access to imported inputs for exporters stimulate growth? Are export-processing zones good

⁶¹ This is the measure of import tariffs we used in Figure I.1 (top panel) previously.

⁶² In his comment on this paper, Chad Jones acknowledges the fragility of many of the results in the literature, but reports a range of exercises that leads him to conclude, as a best estimate, that trade restrictions are harmful to long-run incomes and that the effects are potentially large. We caution the reader about regressions where the level of per-capita income is regressed on measures of trade restrictions. It is well known that countries reduce their trade barriers as they get richer, so "levels" regressions are subject to problems of reverse causality. It is difficult to overcome this problem via instrumentation, since adequate instruments (exogenous variables that are correlated with trade restrictions, but are otherwise uncorrelated with incomes) are particularly difficult to find in this context (as our discussion in section VII highlights). When regressions are run in growth form, we find that none of the available continuous measures of trade restrictions (simple tariff averages or non-tariff coverage ratios) enter significantly in the vast majority of reasonable specifications. Some dichotomous measures based on the continuous variables do somewhat "better," but only if the break point is set at a sufficiently high level (e.g., a tariff rate or non-tariff coverage ratio in excess of 40%).

for growth? Does the variation in tariff rates (or NTBs) across sectors matter? The cross-national work has yet to provide answers to such questions.

Second, we think there is much to be learned from micro-econometric analysis of plant-level data sets. These data sets constitute a rich source for uncovering the ways in which trade policy influences production, employment and technological performance of firms (see Roberts and Tybout 1996). Recent research by Bernard and Jensen (1995, 1998), Aw, Chung, and Roberts (1998), and Clerides, Lach and Tybout (forthcoming) has already shed new light on the relationship between trade and firm performance. For example, these papers (based on the experiences of countries as diverse as the United States, Taiwan, and Mexico) find little evidence that firms derive technological or other benefits from exporting per se; the more common pattern is that efficient producers tend to self-select into export markets. In other words, causality seems to go from productivity to exports, not vice versa. Relating these analyses to trade policies is the obvious next step in this line of research.

Let us close by restating our objective in this paper. We do not want to leave the reader with the impression that we think trade protection is good for economic growth. We know of no credible evidence--at least for the post-1945 period--that suggests that trade restrictions are systematically associated with higher growth rates. What we would like the reader to take away from this paper is some caution and humility in interpreting the existing cross-national evidence on the relationship between trade policy and economic growth.

The tendency to greatly overstate the systematic evidence in favor of trade openness has had a substantial influence on policy around the world. Our concern is that the priority afforded to trade policy has generated expectations that are unlikely to be met, and it may have crowded out other institutional reforms with potentially greater payoffs. In the real world, where

administrative capacity and political capital are scarce, having a clear sense of policy priorities is of utmost importance. The effects of trade liberalization may be on balance beneficial on standard comparative-advantage grounds; the evidence provides no strong reason to dispute this. What we dispute is the view, increasingly common, that integration into the world economy is such a potent force for economic growth that it can effectively substitute for a development strategy.

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Data Appendix

Section I

1. Import Duties as % of Imports. Source: World Bank (1998).
2. Non-Tariff Barriers. Source: Barro and Lee (1994).

Section III

3. bmpav: average black market premium. Source: Sachs and Warner (1995).
4. rcoast: coastal length over total land area. Source: Radelet, Sachs and Lee (1997).
5. tropics: dummy for tropical countries. Source: Radelet, Sachs and Lee (1997).
6. Latin America: dummy for countries in Latin America and the Caribbean.
7. SSA: dummy for countries in sub-Saharan Africa
8. East Asia: dummy for countries in East Asia
9. TAR: own import-weighted ratio of tariff revenues to trade. Source: Barro and Lee (1994).
10. NTB: own-import weighted non-tariff frequency on capital goods and intermediates. Source: Barro and Lee (1994).
11. DISTORTION: ratio of consumption price level to US price level, measured in identical currencies, divided by the fitted value of a regression on GDP, GDP squared, year dummies and continent dummies. Source: Dollar (1992).
12. VARIABILITY: Coefficient of variation of DISTORTION. Source: Dollar (1992).
13. Investment/GDP: Source: Summers and Heston, 1988 for Table III.2, Summers and Heston (1994) for Table III.3.
14. Log initial income: Source: Summers and Heston, 1988 for Table III.2, Summers and Heston (1994) for Table III.3.
15. Schooling, 1975: Barro-Lee (1994).

Section IV

16. BMP: Dummy variable equal to 1 if Black Market Premium exceeds 20% during either the 1970s or the 1980s. Source: Sachs and Warner (1995).
17. BMP70, BMP80: Black Market Premium during (respectively) 70s and 80s. Source: Sachs and Warner (1995).
18. MON: Dummy variable equal to 1 if the country had a score of 4 (highest score) on the Export Marketing Index in World Bank, 1994. Source: Sachs and Warner (1995).
19. SOC: Dummy variable equal to 1 if the country was classified as socialist in Kornai (1992). Source: Sachs and Warner (1995).
20. TAR: own import-weighted ratio of tariff revenues to trade. Source: Barro and Lee (1994).
21. NTB: own-import weighted non-tariff frequency on capital goods and intermediates. Source: Barro and Lee (1994).
22. OPEN: Variable equal to 0 if the country had BMP=1, MON=1, SOC=1, TAR>0.4 or NTB>0.4. Source: Sachs and Warner (1995).
23. BM, SQT, QT, etc.: Openness Indices constructed using subsets of the Sachs-Warner information. The label for each index denotes the openness indicators used to construct that index. M= State Monopoly of Main Export, S= Socialist Economic System, Q= Non-Tariff

Barriers, T= Tariffs, B= Black Market Premium. For example SMQT is set to 0 if it is closed according to either of the criteria for S,M, Q or T, and to 1 otherwise.

24. Inflation, 75-90. Source: World Bank (1998).
25. Debt/Exports, 1985. Source: World Bank (1998).
26. Change in Terms of Trade: Source: Barro-Lee (1994).
27. War: Dummy for countries that participated in at least one external war over the period, 1960-85. Source: Barro-Lee(1994).
28. Quality of Institutions: Institutional Quality Index from Keefer and Knack (1995).
29. Government Budget Surplus, 1970-90. Source: World Bank (1998).
30. Population Growth. Source: World Bank (1998).

Section V

31. Sachs-Warner: Same as OPEN in Section IV.
32. World Development Report: World Development Report Outward Orientation Index 1973-85. Source: Edwards (1998).
33. Leamer: Openness index estimated by Leamer (1988) using residuals from disaggregated trade flows regressions. Source: Edwards (1998).
34. Black Market Premium: same as BMP80 in Section IV.
35. Tariffs: Same as TAR in Section IV.
36. Quotas: Same as NTB in Section IV.
37. Heritage Foundation: Subjective Index of the extent to which government policies distort trade, from Johnson and Sheehy (1996). Source: Edwards (1998).
38. Collected Trade Taxes Ratio: Average for 1980-85 of ratio of total revenues on international trade taxes to total trade. Source: Edwards (1998).
39. Wolf's Index of Import Distortions: A regression-based index from Wolf (1993). Source: Edwards (1998).
40. Principal Components Factor: First Principal component of OPEN, Black Market Premium, Tariffs, Quotas, and Wolf's Index. The equation used to calculate it is

$$COM = -.469*OPEN + .320*BLACK + .494*TARIFF + .553*QR + .354*WOLF.$$
41. Log of GDP per Capita, 1985. From Summers and Heston (1994). Source: Edwards (1998).
42. Property Rights: Heritage Foundation Index of Property Rights Protection, from Johnson and Sheehy (1996). Source: Edwards (1998).
43. Average Import and Export Duties (World Bank): From World Bank (1998). Average duty is calculated as $(1 + \text{export duty}) * (1 + \text{import duty}) - 1$.
44. Merged Duty Index: Simple average of Average duty (43) and (38).
45. Trade Distortion Index based on Lee data. Analog of Heritage Index using data from Lee (1993) in Barro and Lee (1994). Countries are rated on a score of 1 to 5 according to the maximum of its tariff rate and non-tariff barrier coverage ratio: higher than 20%: "very high" (a rating of 5); between 15 and 20%: "high" (4); between 10 and 15%: "moderate" (3); between 5 and 10%: "low" (2); and between 0 and 5%: "very low" (1).

Section VI

46. Contributions to Variance around EC Mean: From Summers and Heston (1994).
47. GDP per Capita (Figure VI.1): Madisson, 1982. Source: Ben-David (1993).

48. GDP per Capita (Figures VI.2 and VI.6, Table 1): Maddison (1995).
49. GDP per Capita (Figures VI.3-VI.5): Summers and Heston (1994).
50. Ratio of Import Duties to Imports, US (Figure VI.6), from Bureau of the Census (1989), Series U211.

Table III.1 Effect of geographical and exchange-rate policy variables on Dollar's index

Dependent Variable: Dollar's Distortion Index

	(1)	(2)
bmpav	0.07*** (1.971)	0.083** (2.47)
rcoast	-0.045* (-3.321)	-0.053* (-3.032)
tropics	0.209*** (1.829)	0.145 (1.004)
Latin America	0.012 (0.097)	-0.037 (-0.257)
SSA	0.451* (3.319)	0.46** (2.43)
East Asia	-0.12 (-0.921)	-0.145 (-0.889)
TAR		-0.017 (-0.08)
NTB		-0.276*** (-1.851)
R ²	0.52	0.58
N	89	71

Notes: Heteroskedasticity-corrected t-statistics in parentheses. See appendix for variable definitions.

Regressions include a constant term and cover only developing countries. Levels of statistical significance indicated by asterisks: * 99 percent; ** 95 percent; *** 90 percent.

Table III.2: Replication and extension of Dollar's (1992) results

Dependent variable: growth of real GDP per capita, 1976-85

	(1)	(2)	(3)	(4)	(5)
DISTORTION	-0.018* (-3.128)	-0.008 (-1.009)	-0.003 (-0.406)	-0.004 (-0.514)	-0.008 (-0.899)
VARIABILITY	-0.080* (-2.64)	-0.080** (-2.084)	-0.103* (-3.3)	-0.107* (-3.51)	-0.099* (-3.212)
Investment/GDP	0.137* (3.515)	0.100** (2.278)			
Latin America		-0.015** (-2.34)	-0.016* (-2.65)	-0.014** (-2.362)	-0.019* (-3.337)
East Asia		0.007 (0.747)	0.010 (0.937)	0.011 (0.976)	0.004 (0.382)
SSA		-0.018** (-2.419)	-0.026* (-3.824)	-0.029* (-4.129)	-0.028* (-3.411)
log initial income				-0.004 (-1.097)	-0.011** (-2.182)
schooling, 1975					0.005** (2.531)
N	95	95	95	95	80
R ²	0.38	0.45	0.40	0.41	0.49

Notes: Heteroskedasticity-corrected t-statistics in parentheses. Regressions include a constant term and cover only developing countries. Levels of statistical significance indicated by asterisks: * 99 percent; ** 95 percent; *** 90 percent.

Table IV.1 Effect of Different Openness Indicators on Growth

	Dependent variable: growth of GDP per capita, 1970-89						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
OPEN	2.44*						
	(5.83)						
BMP		-1.701*					
		(-3.65)					
MON		-2.020*					
		(-2.84)					
SOC		-1.272					
		(-1.39)					
NTB		-0.453					
		(-0.81)					
TAR		-0.134					
		(-0.18)					
BM			2.086*		2.119*	2.519*	2.063*
			(4.82)		(5.09)	(5.94)	(4.64)
SQT				0.877***	0.735	0.663	
				(1.82)	(1.59)	(1.30)	
SOC							.389
							(.56)
QT							.657
							(1.28)
R ²	.593	.637	0.522	0.455	0.617	.522	.619
N	79	71	78	75	74	74	74

All Equations except column 6 include the following controls: Log of GDP in 1970, investment rate, 1970, government consumption/GDP, assassinations per capita, deviation from world investment prices, secondary schooling ratio, primary schooling ratio, revolutions and coups, and a constant term. Column 6 drops the investment rate and deviation from world investment prices. Numbers in parentheses are t-statistics based on Huber-White heteroskedasticity-consistent standard errors.

Table IV.2: Effect of Black Market Premium on Growth Before and After Controlling for Measures of Macroeconomic and Political Disequilibrium

	Dependent Variable: Growth of GDP per capita, 1970-89						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Black Market Premium	-1.044** (-2.47)	-0.727 (-1.57)	-0.768 (-1.62)	-1.200* (-2.84)	-0.945** (-2.31)	-0.551 (-1.66)	-0.438 (-.98)
Inflation, 1975-1990		-3.201*** (-1.78)					-1.024 (-.58)
Debt/GDP Ratio in 1985			-0.015* (-5.75)				-0.011* (-3.21)
Terms of Trade Shock				1.038 (0.42)			3.894 (1.48)
War					-1.378** (-2.32)		-0.135 (-0.15)
Quality of Institutions						0.441* (2.86)	0.433*** (2.00)
Summary Statistics							
R ²	0.476	.382	.589	.496	.507	.567	.703
N	80	76	54	77	80	75	46

All Equations include the following controls: log of GDP in 1970, investment rate, 1970, government consumption/GDP, assassinations per capita, deviation from world investment prices, secondary schooling ratio, primary schooling ratio, revolutions and coups and a constant term. Numbers in parentheses are t-statistics based on Huber-White heteroskedasticity-consistent standard errors.

TableV.1: Alternative Weighting Assumptions.

	Dependent Variable: TFP Growth, 1980-90					
	(1)	(2)	(3)	(4)	(5)	(6)
Openness Indicators	Weighted Least Squares (weight=GDP)	Weighted 2SLS (weight=GDP)	Weighted Least Squares (weight=ln(GDP))	Weighted 2SLS (weight=ln(GDP))	Robust Standard Errors	2SLS, Robust Standard Errors
1. Sachs-Warner	0.0094** (2.12)	0.0089*** (1.84)	0.0101*** (1.81)	0.0080 (1.28)	0.0102 (1.54)	0.0078 (1.06)
2. World Development Report	0.0075* (3.57)	0.0131* (3.36)	0.0070** (2.45)	0.0126** (2.64)	0.0068* (3.67)	0.0126** (2.13)
3. Leamer	0.0010 (1.03)	0.0123 (1.40)	0.0041 (0.82)	-0.0013 (-0.20)	0.0041 (0.82)	-0.0033 (-0.32)
4. Black Market Premium	-0.0217* (-3.59)	-0.0192*** (-1.95)	-0.0108** (-2.57)	-0.0035 (-0.56)	-0.0098*** (-1.79)	-0.0027 (-0.54)
5. Tariffs	-0.0450* (-2.77)	-0.1001 (-1.52)	0.0065 (0.51)	0.0013 (0.03)	0.0114 (0.88)	0.0079 (0.28)
6. Quotas	-0.0047 (-0.45)	-0.0398 (-0.42)	0.0029 (0.35)	0.0461 (0.68)	0.0036 (0.43)	0.0401 (0.79)
7. Heritage Foundation	-0.0074* (-4.50)	-0.0133* (-3.75)	-0.0066** (-3.02)	-0.0195* (-3.30)	-0.0064* (-2.87)	-0.0202* (-3.24)
8. Collected Trade Taxes Ratio	-0.4849* (3.04)	-1.6668** (-2.15)	-0.2808** (-2.15)	-1.8256 (-1.23)	-0.2676** (-2.25)	-1.8368 (-1.06)
9. Wolf's index of Import Distortions	3.5E-05 (0.27)	-2.6E-04 (-0.72)	4.8E-05 (0.41)	-3.7E-04 (-0.99)	4.1E-05 (0.36)	-3.3E-04 (-1.21)
10. Principal Components Factor	-0.0070** (-2.38)		-0.0047 (-1.61)		-0.0043 (-1.37)	

Notes: These are the estimated coefficients from regressions where each of the trade policy indicators is entered separately. Each equation also includes log GDP per capita in 1965 and schooling in 1965 as regressors (as in the original Edwards [1998] specification). t-statistics are in parentheses (based on heteroskedasticity-consistent standard errors in column 3.)

TableV.2: Sensitivity to Identification Assumptions and Choice of Trade Tax Indicator.

	Dependent Variable: TFP Growth, 1980-90							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
World Development Report Index	0.0126** (2.13)	0.0023 (0.40)						
Heritage Foundation Index			-0.0202* (-3.24)	-0.003 (-0.24)				
Property Rights		-0.0107* (-2.91)		-0.010 (-1.43)				
Collected Taxes Ratio (Edwards)					-0.2676 (-2.25)**			
Average Duty (World Bank)						0.0225 (1.01)		
Average Import Duty (World Bank)							0.0007 (2.30)**	0.0003 (0.884)
Average Export Duty (World Bank)							-0.0003 (-1.09)	
Test of Overidentifying Restrictions	29.3244		5.4072					
p-value	6.72E-06		0.2480					
N	30	30	56	56	45	43	43	66

Notes: Each equation also includes log GDP per capita in 1965 and schooling in 1965 as regressors. T-statistics based on heteroskedasticity-consistent standard errors in parentheses.

Table VII.1 : Frankel-Romer regressions with additional geographical variables

	1	2	3	4	5	6	7	8
Trade share	0.85 (3.47)	0.57 (3.00)	0.46 (2.36)	0.61 (3.88)	1.97 (1.99)	0.34 (0.41)	0.21 (0.26)	0.25 (0.41)
Disteq		3.58 (9.26)				3.65 (7.98)		
Tropics			-1.42 (-9.84)				-1.46 (-8.03)	
East Asia				-1.21 (-7.71)				-1.21 (-7.59)
Latin America				-0.67 (-4.48)				-0.74 (-3.83)
Sub-Saharan Africa				-1.94 (-14.72)				-1.99 (-12.82)
method	OLS	OLS	OLS	OLS	IV	IV	IV	IV
n	150	150	145	150	150	150	145	150
R ²	0.0949	0.4312	0.4628	0.66	0.43	0.44	0.4563	0.65

Note: The dependent variable is log of income per person in 1985. IV standard errors include adjustment for generated regressors. All equations include the logs of population and land area. "Disteq" is distance from equator, as measured by Hall and Jones (1998). "Tropics" is fraction of country's area in tropics, as measured by Radelet, Sachs, and Lee (1997).

Figure I.1: Partial Association between Growth and Direct Measures of Trade Restrictions

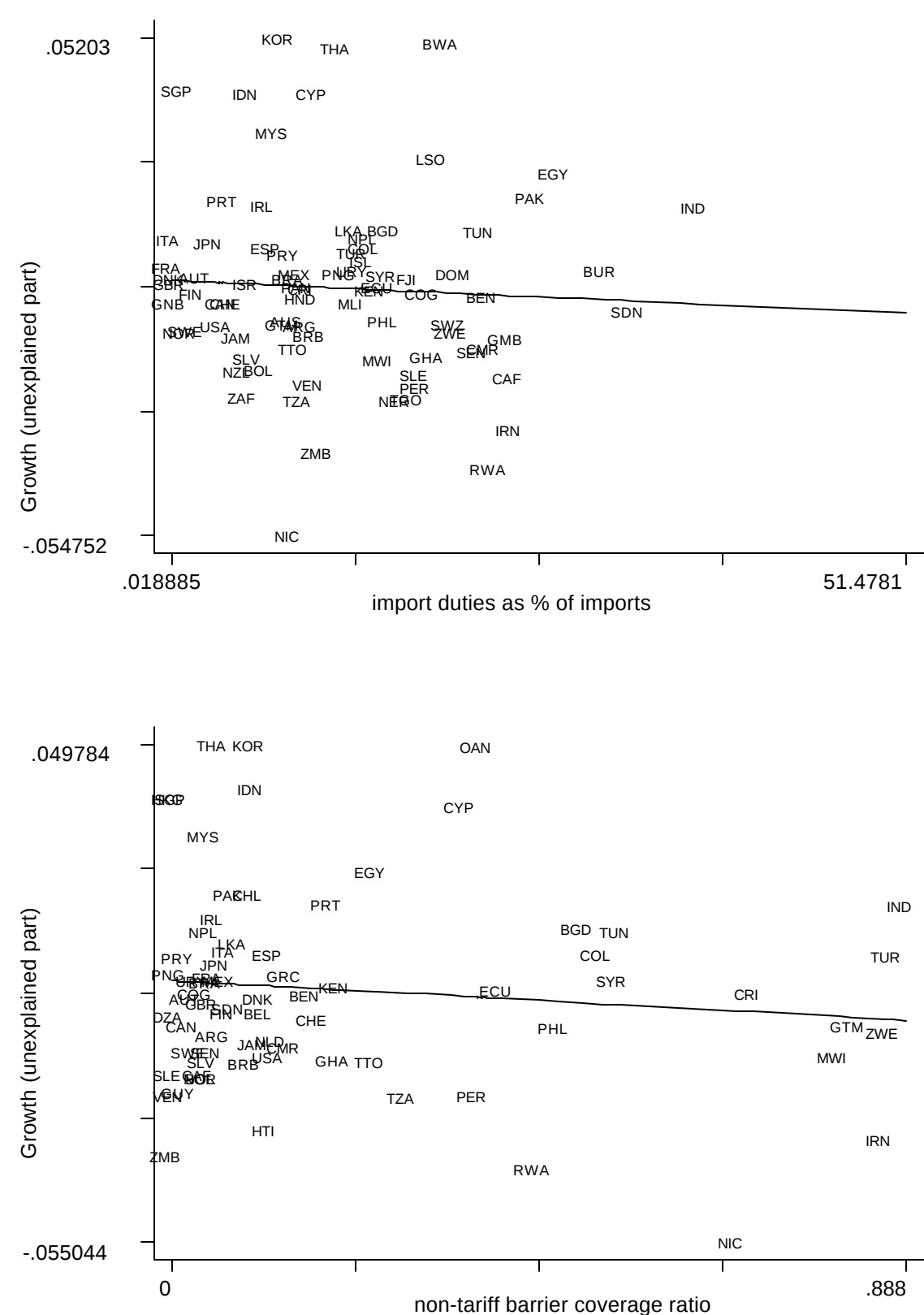


Figure II.1: Growth rates of GDP at world prices

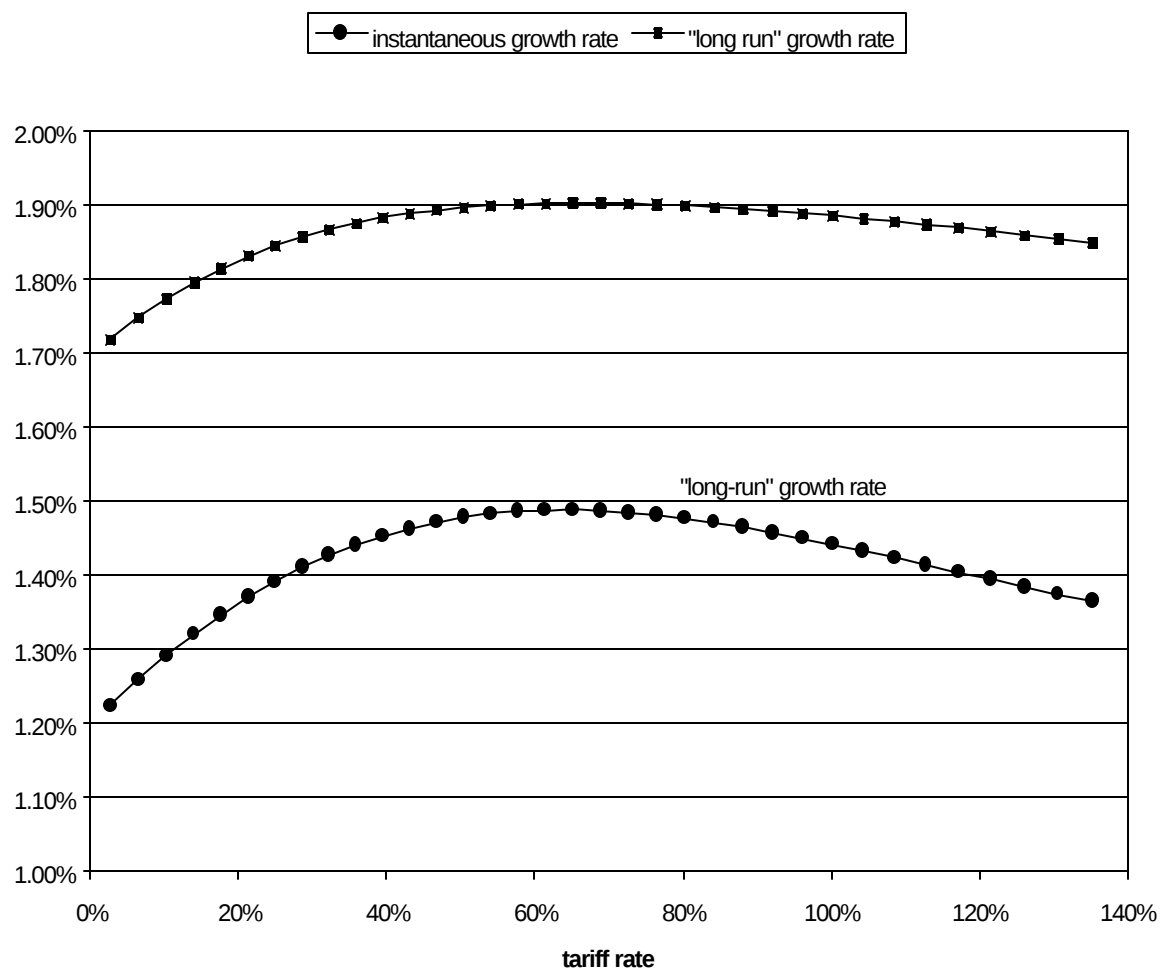


Figure VI.1: Effect of excluding Germany in Dispersion Calculations

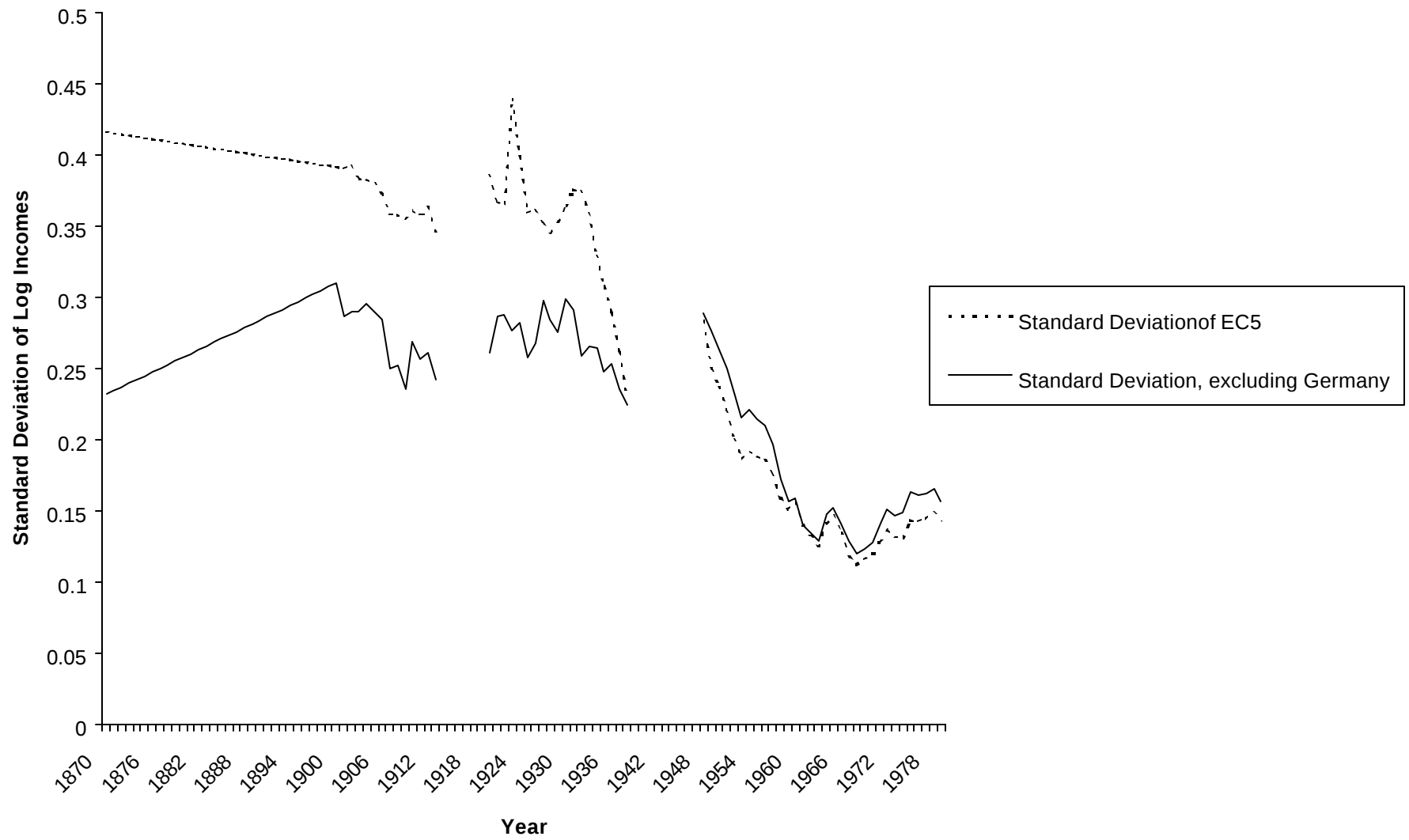


Figure VI.2: Dispersion of Per Capita Incomes and Trade Policy Events

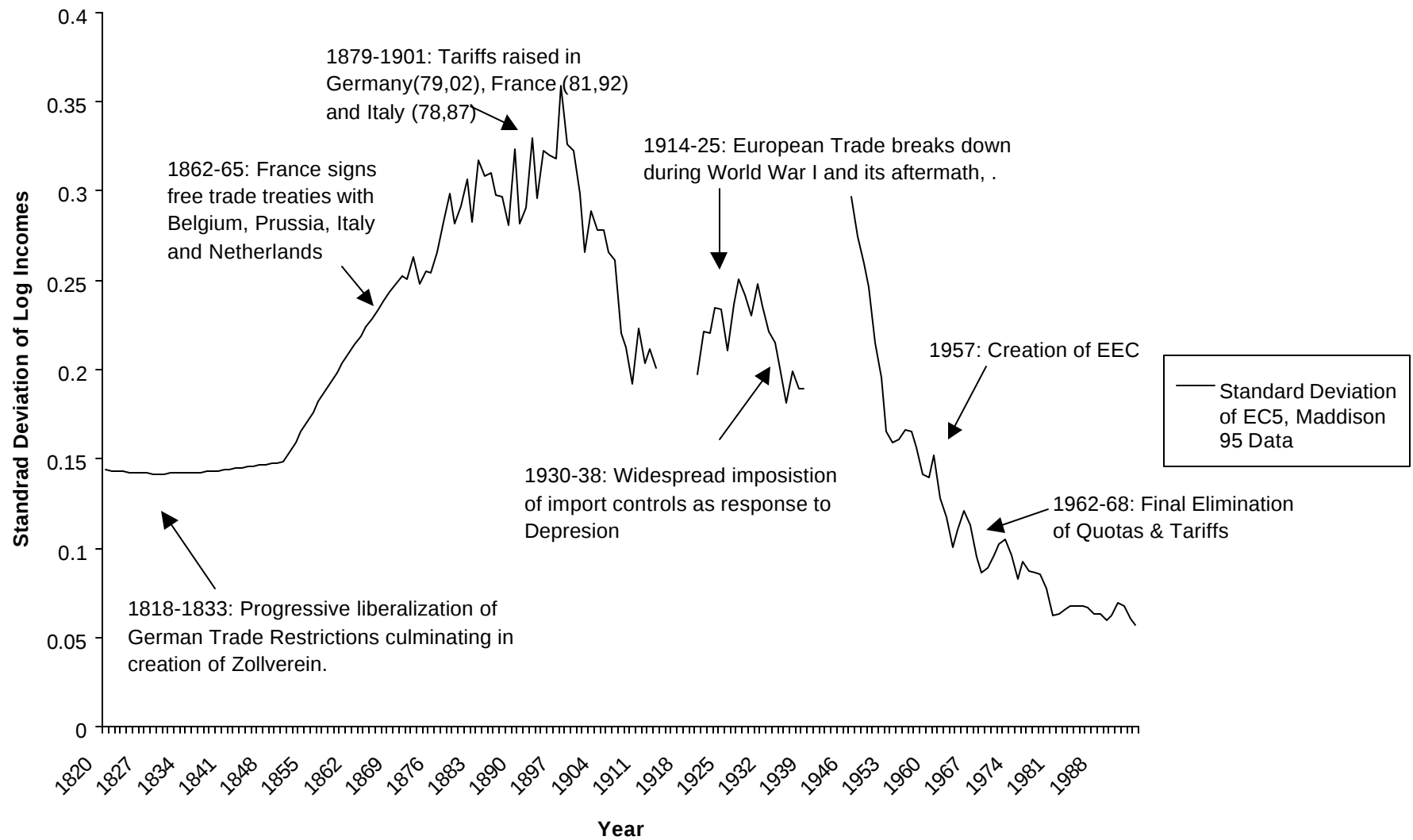


Figure VI.3: GDP of UK, Denmark and Ireland, relative to EEC Mean

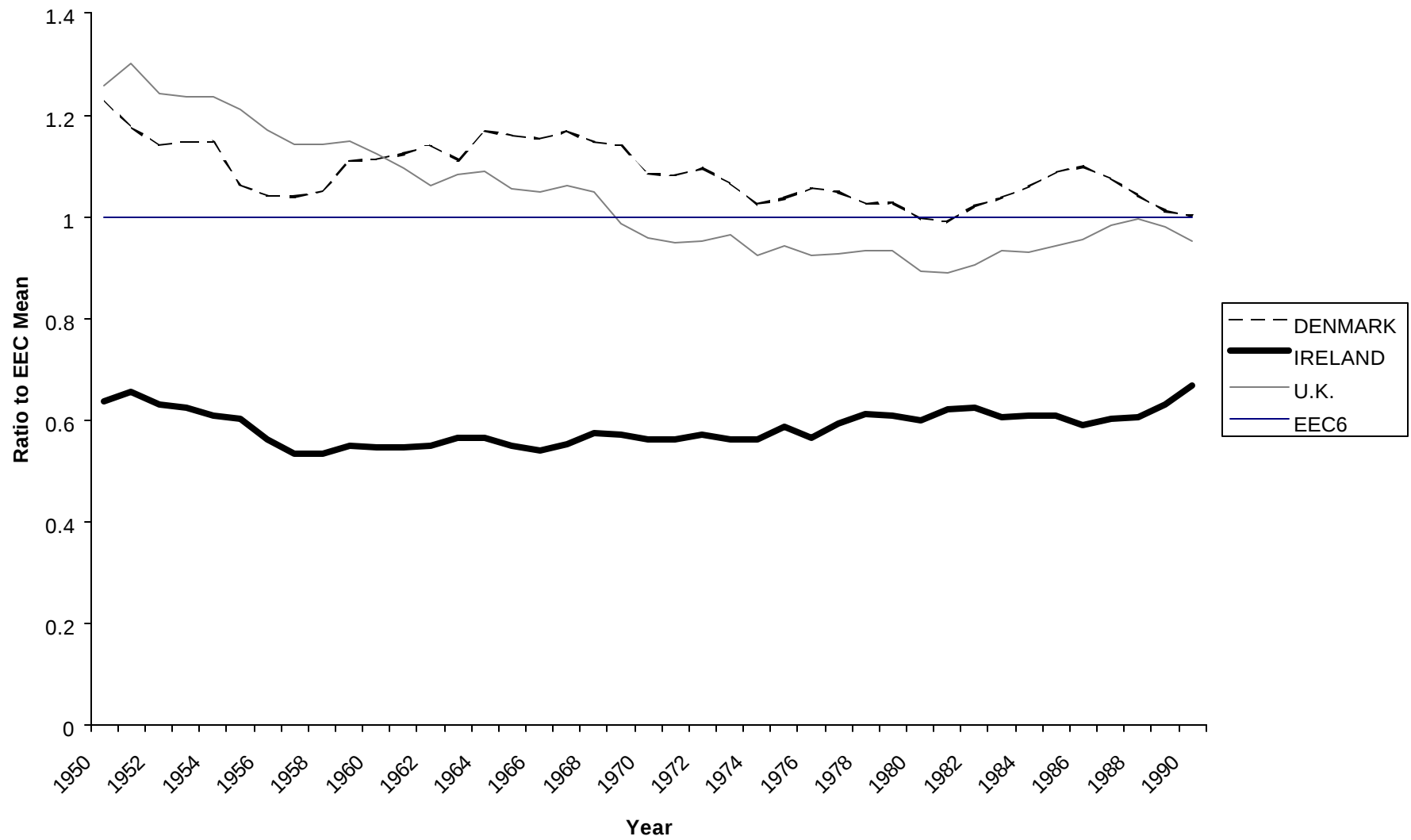


Figure VI.4: Contribution to Variance around European Mean

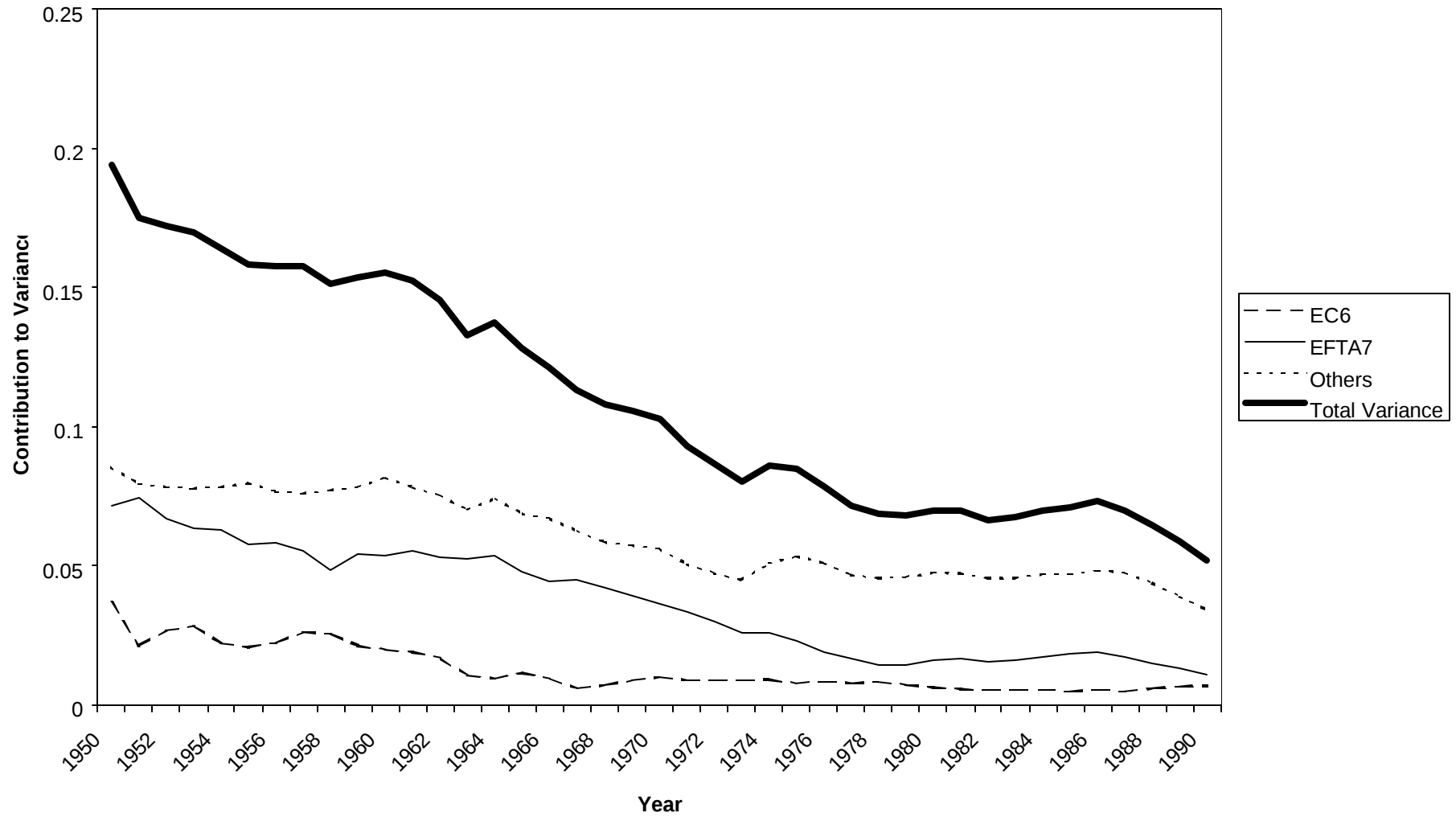


Figure VI.5: Ratio of US to European GDP and Import Duties, 1820-1938



What You Export Matters*

Ricardo Hausmann
John F. Kennedy School of Government
Harvard University

Jason Hwang
Department of Economics
Harvard University

Dani Rodrik
John F. Kennedy School of Government
Harvard University

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Abstract

When local cost discovery generates knowledge spillovers, specialization patterns become partly indeterminate and the mix of goods that a country produces may have important implications for economic growth. We demonstrate this proposition formally and adduce some empirical support for it. We construct an index of the "income level of a country's exports," document its properties, and show that it predicts subsequent economic growth.

1 Introduction

Why do countries produce what they do, and does it matter? The conventional approach to these questions is driven by what we might call the "fundamentals" view of the world. In this view, a country's fundamentals—namely its endowments of physical and human capital, labor, and natural resources along with the overall quality of its institutions—determine relative costs and the patterns of specialization that go with them. Attempts to reshape the production structure beyond the boundaries set by these fundamentals are likely to fail and hamper economic performance.

We present in this paper a complementary argument that emphasizes the idiosyncratic elements in specialization patterns. While fundamentals play

*Hausmann and Rodrik thank the Center for International Development for financial support. Oeindrila Dube and Bailey Klinger provided excellent research assistance. We also thank Ralph Ossa and Liu Chunyong for catching typos in an earlier version.

an important role, they do not uniquely pin down what a country will produce and export. What is critical to our argument—and what drives its policy implications—is that not all goods are alike in terms of their consequences for economic performance. Specializing in some products will bring higher growth than specializing in others. In this setting, government policy has a potentially important positive role to play in shaping the production structure.

We do not claim any novelty for the idea that specialization patterns are not entirely predictable. It has long been understood that Switzerland's prowess in watches, say, or Belgium's in chocolates cannot be explained by the normal forces of comparative advantage. To resolve such puzzles, economists have long relied on models with increasing returns to scale, network effects, technological spillovers, thick-market externalities, or some combination thereof.¹ What we add to this literature is the idea that production indeterminacy maps into economic performance in a straightforward and empirically verifiable way: it allows some countries to grow faster by exporting those goods that advanced countries specialize in, while preventing others from producing the goods that would make them richer. Countries become what they produce.

To model this process formally we appeal to a mechanism that we have earlier called "cost discovery" (Hausmann and Rodrik 2003), and which we believe is particularly important in developing countries with undiversified production structures. An entrepreneur who attempts to produce a good for the first time in a developing economy necessarily faces considerable cost uncertainty. Even if the good comes with a standard technology ("blueprint"), domestic factor endowments and institutional realities will require tinkering and local adaptation (see Evenson and Westphal 1995, Lall 2000). What the entrepreneur effectively does is to explore the underlying cost structure of the economy. This process is one with considerable positive externalities for other entrepreneurs. If the project is successful, other entrepreneurs learn that the product in question can be profitably produced and emulate the incumbent. In this way, the returns to the pioneer investor's cost discovery become socialized. If the incumbent ends up with failure, on the other hand, the losses remain private. This knowledge externality implies that investment levels in cost discovery are sub-optimal unless the industry or the government find some way in which the externality can be internalized.

In such a setting, the range of goods that an economy ends up producing and exporting is determined not just by the usual fundamentals, but also by the number of entrepreneurs that can be stimulated to engage in cost discovery in the modern sectors of the economy. The larger this number, the closer that the economy can get to its productivity frontier. When there is more cost discovery, the productivity of the resulting set of activities is higher in expectational terms and the jackpot in world markets bigger.

In what follows we provide a simple formal model of this process. We also supply some evidence that we think is suggestive of the importance of the

¹See for example Fujita, Krugman, Venables (1999) on geographic specialization, Porter (1990) on industry clusters, and Banerjee and Munshi (2004) on networks.

forces that our formal framework identifies. We are interested in showing that some traded goods are associated with higher productivity levels than others and that countries that latch on to higher productivity goods (through the cost discovery process just described) will perform better. Therefore, the key novelty is a quantitative index that ranks traded goods in terms of their implied productivity. We construct this measure by taking a weighted average of the per-capita GDPs of the countries exporting a product, where the weights reflect the revealed comparative advantage of each country in that product.² So for each good, we generate an associated income/productivity level (which we call *PRODY*). We then construct the income/productivity level that corresponds to a country's export basket (which we call *EXPY*), by calculating the export-weighted average of the *PRODY* for that country. *EXPY* is our measure of the productivity level associated with a country's specialization pattern.

While *EXPY* is highly correlated with per-capita GDPs, we show that there are interesting discrepancies. Some high-growth countries such as China and India have *EXPY* levels that are much higher than what would be predicted based on their income levels. China's *EXPY*, for example, exceeds those of countries in Latin America with per-capita GDP levels that are a multiple of that of China. More generally, we find that *EXPY* is a strong and robust predictor of subsequent economic growth, controlling for standard covariates. We show this result for a recent cross-section as well as for panels that go back to the early 1960s. The results hold both in instrumental variables specifications (to control for endogeneity of *EXPY*) and with country fixed effects (to control for unobserved heterogeneity).

Our approach relates to a number of different strands in the literature. Recent work in trade theory has emphasized cost uncertainty and heterogeneity at the level of firms so as to provide a better account of global trade (Bernard et al. 2003, Melitz and Ottaviano 2005). In contrast to this literature, we focus on the spillovers in cost information and are interested in the economic growth implications. There is also an empirical literature on the so-called natural resource curse, which examines the relationship between specialization in primary products and economic growth (Sachs and Warner 1995). The rationale for the natural resource curse is based either on the Dutch disease or on an institutional explanation (Subramanian and Sala-i-Martin 2003). Our approach has different micro-foundations than either of these, and yields an empirical examination that is much more fine-grained. We work with two datasets consisting of more than 5,000 and 700 individual commodities each and eschew a simple primary-manufactured distinction.

Our framework also suggests a different binding constraint on entrepreneurship than is typically considered in the literature on economic development. For example, there is a large body of work on the role that credit constraints play as a barrier to investment in high-return activities (see for example McKenzie and Woodruff [2003] and Banerjee and Duflo [2004]). In our framework, improv-

²A very similar index was previously developed by Michaely (1984), whose work we are happy to acknowledge. We encountered Michaely's index after the working paper version of this paper was completed and distributed.

ing the functioning of financial markets would not necessarily generate much new activity as it would not enable entrepreneurs to internalize the information externality their activities generate. Similarly, there is a large literature that points to institutional weaknesses, such as corruption and poor enforcement of contracts and property rights (see Fisman [2001] and Svensson [2003]), as the main culprit. Remedying these shortcomings may also not be particularly effective in spurring entrepreneurship if the main constraint is the low appropriability of returns due to information externalities. A third strand of the literature emphasizes barriers to competition and entry as a serious obstacle (see Djankov et al. [2002] and Aghion et al. [2005]). In our setting, removing these barriers would be a mixed blessing: anything that erodes the rents of incumbents will result in less entrepreneurial investment in cost discovery in equilibrium.

While we do not claim that cost-discovery externalities are more important than these alternative explanations, we believe that they do play a role in restricting entrepreneurship where it matters the most—in new activities with significantly higher productivity. Our empirical evidence suggests that failure to develop such new activities extracts a large growth penalty.

The outline of the paper is as follows. We begin in section 2 with a simple model that develops the key ideas. We then present the empirical analysis in section 3. We conclude in section 4.

2 A simple model

We are concerned with the determination of the production structure of an economy in which the standard forces of comparative advantage play some role, but not the exclusive role. The process of discovering the underlying cost structure of the economy, which is intrinsically uncertain, contributes a stochastic dimension to what a country will produce and therefore how rich it will be.

We normalize units of goods such that all goods have an exogenously given world price p . Each good is identified by a certain productivity level θ , which represents the units of output generated by an investment of given size. We align these goods on a continuum such that higher-ranked goods entail higher productivity. The range of goods that an economy is capable of producing is given by a continuous interval between 0 and h , i.e., $\theta \in [0, h]$ (see Figure 1). We capture the role of comparative advantage by assuming that the upper boundary of this range, h , is an index of the skill- or human-capital level of the economy. Hence a country with higher h can produce goods of higher productivity ("sophistication").

Projects are of fixed size and entail the investment of b units of labor. When investors make their investment decisions, they do not know whether they will end up with a high-productivity good or a low-productivity good. The θ associated with an investment project is discovered only after the investment is sunk. All that investors know ex ante is that θ is distributed uniformly over the range $[0, h]$.

However, once the θ associated with a project/good is discovered, this be-

comes common knowledge. Others are free to produce that same good without incurring additional "discovery" costs (but at a somewhat lower productivity than the incumbent). Emulators operate at a fraction α of the incumbent's productivity, with $0 < \alpha < 1$. Each investor can run only one project, so having discovered the productivity of his own project, the investor has the choice of sticking with that project or emulating another investor's project.

An investor contemplating this choice will compare his productivity θ_i to that of the most productive good that has been discovered, $\theta^{\max}$, since emulating any other project will yield less profit. Therefore, the decision will hinge on whether θ_i is smaller or bigger than $\alpha\theta^{\max}$. If $\theta_i \geq \alpha\theta^{\max}$, investor i will stick with his own project; otherwise he will emulate the $\theta^{\max}$ -project. Therefore the productivity range within which firms will operate is given by the thick part of the spectrum shown in Figure 1.

Now let's move to the investment stage and consider the expected profits from investing in the modern sector. These expected profits depend on expectations regarding both the investor's own productivity draw and the maximum of everybody else's draws. As we shall see, the latter plays a particularly important role. Obviously, $E(\theta^{\max})$ will be an increasing function of the number of investors who start projects. Let m denote the number of investors who choose to make investments in the modern sector. Given our distributional assumptions, we have a particularly simple expression for $E(\theta^{\max})$:

$$E(\theta^{\max}) = \frac{hm}{m+1}$$

Note that $E(\theta^{\max})$ equals 0 when $m = 0$, and converges to h as $m \rightarrow \infty$.

Since productivity is distributed uniformly, the probability that investor i will stick with his own project is

$$\text{prob}(\theta_i \geq \alpha\theta^{\max}) = 1 - \frac{\alpha E(\theta^{\max})}{h} = 1 - \frac{\alpha m}{m+1}.$$

This eventuality yields the following expected profits

$$E(\pi | \theta_i \geq \alpha\theta^{\max}) = \frac{1}{2}p[h + \alpha E(\theta^{\max})] = \frac{1}{2}ph[1 + \frac{\alpha m}{m+1}]$$

since $\frac{1}{2}[h + \alpha\theta^{\max}]$ is the expected productivity of such a project. We can similarly work out the probability and expected profits for the case of emulation:

$$\text{prob}(\theta_i < \alpha\theta^{\max}) = \frac{\alpha E(\theta^{\max})}{h} = \frac{\alpha m}{m+1}.$$

$$E(\pi | \theta_i < \alpha\theta^{\max}) = \frac{1}{2}p[h + \alpha E(\theta^{\max})] = ph \left(\frac{\alpha m}{m+1} \right)$$

Putting these together, we have

$$E(\pi) = ph \left[\left(1 - \frac{\alpha m}{m+1} \right) \frac{1}{2} \left(1 + \frac{\alpha m}{m+1} \right) + \left(\frac{\alpha m}{m+1} \right)^2 \right]$$

$$= \frac{1}{2}ph \left[1 + \left(\frac{\alpha m}{m+1} \right)^2 \right] \quad (1)$$

Note that expected productivity in the modern sector is

$$E(\theta) = \bar{\theta} = \frac{1}{2}h \left[1 + \left(\frac{\alpha m}{m+1} \right)^2 \right] \quad (2)$$

Expected profits shown in (1) are simply the product of price and expected productivity. Expected productivity, and in turn profitability are determined both by "skills" (h) and by the number of investors engaged in cost discovery (m). The larger m , the higher the productivity in the modern sector. Hence we have increasing returns to scale in the modern sector, but this arises from cost information spillovers rather than technological externalities. If α were zero, productivity and profits would not depend on m .

2.1 Long-run equilibrium

In long-run equilibrium, the number of entrants in the modern sector (m) is endogenous and is determined by the requirement that excess profits are driven to zero. Let us express the flow (expected) profits in this sector as

$$r(p, h, m^*) = E(\pi)_{LR} = \frac{1}{2}ph \left[1 + \left(\frac{\alpha m^*}{m^* + 1} \right)^2 \right]$$

where m^* denotes the long-run level of m . Remember that each modern sector investment requires b units of labor upfront, resulting in a sunk investment of bw , where w is the economy's wage rate. Long-run equilibrium requires equality between the present discounted value of $r(p, h, m^*)$ and the sunk cost of investment:

$$\int_0^\infty r(p, h, m^*) e^{-\rho t} dt = \frac{r(p, h, m^*)}{\rho} = bw^* \quad (ZP)$$

where ρ is the discount rate.

Wages are determined in turn by setting the economy's total labor demand equal to the fixed labor supply L . The modern sector's labor demand equals m^*b . Let the traditional sector's labor demand be given by the decreasing function $g(w)$, $g'(w) < 0$. Labor market equilibrium is then given by

$$m^*b + g(w^*) = L \quad (LL)$$

Equations (ZP) and (LL) determine the long-run values of the endogenous variables m and w . The equilibrium is shown in Figure 2, which plots these two equations in (m, w) -space. Note that (ZP) and (LL) are both positively sloped. We have drawn (ZP) as less steep than (LL), because otherwise scale economies would be so strong that the dynamic behavior of the model would be unstable under reasonable specifications. This amounts to assuming that α is not too large.

2.2 Short-run equilibrium

In short-run equilibrium we require labor markets to clear but take m as fixed. This means we are always on the (LL) schedule, with the wage rate determined by equation (LL) for a given m .

2.3 Dynamics

Given our assumptions so far, if m were allowed to adjust instantaneously we would jump immediately to the long-run equilibrium given by the intersection of the (ZP) and (LL) schedules. In fact, forward-looking behavior on the part of investors in the modern sector provides an additional mechanism for immediate convergence to the long-run equilibrium. Suppose, for example, that we start at a level of m which falls short of m^* . On the transition to the long-run equilibrium, we know that m and w will both rise. Consider how these dynamics influence the decision to enter. The rise in m implies that productivity will be higher in the future than it is today, and is a force that will induce delay in the decision to invest in the modern sector *ceteris paribus*. The rise in w , on the other hand, implies that investment will be more costly in the future than it is today, and is a factor that will precipitate investment. Given the relative slopes we have assumed, the second factor outweighs the first—i.e., wages increase faster than the rate at which productivity benefits come in—and investors would rather invest today than wait.

To provide the model with some non-trivial dynamics, we can simply assume that there is a limit to how much investment is feasible per unit of time. To be concrete, let the rate at which m increases be restricted by the exogenous parameter μ . That is

$$\left| \dot{m}(t) \right| \leq \mu$$

Given the considerations discussed in the previous paragraph, there will be maximal adjustment in m whenever net returns at time t are non-zero. Hence,

$$\begin{aligned} \dot{m}(t) &= \mu & \text{if} & \quad \frac{r(p, h, m(t))}{\rho} > bw(t) \\ \dot{m}(t) &= -\mu & \text{if} & \quad \frac{r(p, h, m(t))}{\rho} < bw(t) \\ \dot{m}(t) &= 0 & \text{otherwise} \end{aligned}$$

2.4 Comparative dynamics

We are now ready to analyze the behavior of the economy. Starting from an initial equilibrium given by (m_0, w_0) , consider an increase in the economy's labor endowment. This shifts the LL schedule down since, at a given m , labor-market equilibrium requires lower wages. Hence the impact effect of larger L is a lower w . However, the lower wage induces more firms to enter the modern sector and engage in cost discovery, which in turn pulls wages up. How high do wages eventually go? As Figure 2 shows, the new equilibrium is one where

wages are higher than in the initial equilibrium. A larger labor endowment ends up boosting wages! What is key for this result is the presence of information spillovers in the modern sector. Once the modern sector expands, productivity rises, and zero profits can be restored only if wages go up.

Increases in p and h operate by shifting the ZP schedule up. They both result in higher m and w eventually. These results are less surprising.

2.5 Discussion

Our framework is obviously related to models in the endogenous-growth tradition where there are externalities in the imitation and innovation process (Grossman and Helpman 1991, Aghion and Howitt 1998, Barro and Sala-i-Martin 2003). Models of the latter kind also generate the result that entrepreneurial activity is too low in the laissez-faire equilibrium. What is different in our approach is that it identifies a potentially empirically verifiable relationship between the *type* of goods that an economy specializes in and its rate of economic growth. In our framework anything that pushes the economy to a higher $\theta^{\max}$ sets forth a dynamic (if temporary) process of economic growth as emulators are drawn in to produce the newly discovered high-productivity good(s). In the empirical work below, we will try to document this particular link by developing an empirical proxy for $\theta^{\max}$ and examining its relationship with growth.

3 Empirics

The model shows that productivity in the modern sector is driven by $\theta^{\max}$, which depends on m , which in turn is driven by country size (L), human capital (h), and other parameters. In our empirical work, we shall proxy $\theta^{\max}$ with a measure calculated from export statistics which we call *EXPY*. This measure aims to capture the productivity level associated with a country's exports. Focusing on exports is a sensible strategy since $\theta^{\max}$ refers to the most productive goods that a country produces and we can expect a country to export those goods in which it is the most productive. Besides, we have much more detailed data on exports across countries than we do on production.

In order to calculate *EXPY* we rank commodities according to the income levels of the countries that export them. Commodities that are exported by rich countries (controlling for overall economic size) get ranked more highly than commodities that are exported by poorer countries. With these commodity-specific calculations, we then construct country-wide indices.

3.1 Construction of *EXPY*

First, we construct an index called *PRODY*. This index is a weighted average of the per capita GDPs of countries exporting a given product, and thus represents the income level associated with that product. Let countries be indexed by j

and goods be indexed by l . Total exports of country j equals

$$X_j = \sum_l x_{jl}$$

Let the per-capita GDP of country j be denoted Y_j . Then the productivity level associated with product k , $PRODY_k$, equals

$$PRODY_k = \sum_j \frac{(x_{jk}/X_j)}{\sum_j (x_{jk}/X_j)} Y_j$$

The numerator of the weight, x_{jk}/X_j , is the value-share of the commodity in the country's overall export basket. The denominator of the weight, $\sum_j (x_{jk}/X_j)$, aggregates the value-shares across all countries exporting the good. Hence the index represents a weighted average of per-capita GDPs, where the weights correspond to the revealed comparative advantage of each country in good k .

The rationale for using revealed comparative advantage as a weight is to ensure that country size does not distort our ranking of goods. Consider an example involving Bangladesh and US garments, specifically, the 6-digit product category 620333, "men's jackets and blazers, synthetic fiber, not knit." In 1995, the US export value for this category was \$28,800,000, exceeding Bangladesh's export value of \$19,400,000. However, this commodity constituted only 0.005 percent of total US exports, compared to 0.6 percent for Bangladesh. As defined above, the *PRODY* index allows us to weight Bangladesh's income more heavily than the U.S. income in calculating the productivity level associated with garments, even though the U.S. exports a larger volume than Bangladesh.

The productivity level associated with country i 's export basket, $EXPY_i$, is in turn defined by

$$EXPY_i = \sum_l \left(\frac{x_{il}}{X_i} \right) PRODY_l$$

This is a weighted average of the *PRODY* for that country, where the weights are simply the value shares of the products in the country's total exports.³

3.2 Data and methods

Our trade data come from two sources. The first is the United Nations Commodity Trade Statistics Database (COMTRADE) covering over 5000 products at the Harmonized System 6-digit level for the years 1992 to 2003. The value of exports is measured in current US dollars. The number of countries that report the trade data vary considerably from year to year. However, we constructed

³As we noted in the introduction, Michaely (1984) previously developed a similar index and called it "income level of exports." Michaely used a different weighting scheme in generating what we call *PRODY*, with each country's weight corresponding to the market share in global exports of the relevant commodity. Compared to ours, therefore, Michaely's approach overweights large countries. Michaely's calculations were undertaken for 3-digit SITC categories. More recently, Lall et al. (2005) have also developed a similar measure that they call the "sophistication level of exports."

the *PRODY* measure for a consistent sample of countries that reported trade data in each of the years 1999, 2000 and 2001. It is essential to use a consistent sample since non-reporting is likely to be correlated with income, and thus, constructing *PRODY* for different countries during different years could introduce serious bias into the index. While trade data were actually available for 124 countries over 1999-2001, the real per capita GDP data from the World Development Indicators (WDI) database was only available for 113 of these countries. Thus, with the COMTRADE data, we calculate *PRODY* for a sample of 113 countries. We calculate *PRODY* using both PPP-adjusted GDP and GDP at market exchange rates. In what follows we shall present most of our results only with the PPP-adjusted measures of *PRODY*; we have found no instance in which using one instead of the other makes a substantive difference.

The average *PRODY* from 1999-2001 is then used to construct an *EXPY* measure for all countries reporting trade data during the period from 1992 to 2003. Since the number of countries reporting COMTRADE data varies from year to year, and the coverage is especially patchy for earlier years, the total number of countries for which we could calculate *EXPY* ranges from a low of 48 in 1992 to a high of 133 in 2000. Table 1 shows the country coverage for each of the years between 1992 and 2003.

Some limitations of COMTRADE data are its relatively short time-span and limited coverage of countries earlier in the period. To check the robustness of our findings against these concerns, we have also constructed our measures with the World Trade Flows dataset which has recently been updated to extend coverage back to 1962 (Feenstra et al. 2005). Trade flows are based on 4-digit standard international trade classifications (SITC rev. 2) comprising over 700 commodities. Our *PRODY* and *EXPY* indices are calculated by combining the World Trade Flows data on export volumes with PPP-adjusted GDP from the Penn World Tables, yielding a sample of 97 countries for the period 1962-2000.

We prefer to work with the indices based on more disaggregated data, and the basic patterns in the data are very much consistent between the two datasets. Hence we limit our discussion of descriptive statistics below to the COMTRADE data. We return to the 4-digit data when we turn to growth regressions.

3.3 Descriptive statistics

Some descriptive statistics on *PRODY* are shown in Table 2. The first row shows *PRODY* calculated using GDP at market exchange rates and the second row shows *PRODY* with PPP-adjusted GDP levels. As the table reveals, the income level associated with individual traded commodities varies greatly, from numbers in hundreds (of 2000 US dollars) to tens of thousands. This reflects the fact that specialization patterns are highly dependent on per-capital incomes.

The five commodities with the smallest and largest *PRODY* values are shown in Table 3. As we would expect, items with low *PRODY* tend to be primary commodities. Consider for example product 10120, “live asses mules and hinnies.” The main reason this product has the lowest income level is that it constitutes a relatively important part of the exports of Niger, a

country with one of the lowest per capita GDPs in our sample. Similarly, sisal, cloves, and vanilla beans have low *PRODY* values because they tend to be significant exports for poor sub-Saharan African countries. On the other hand, product 7211060, flat rolled iron or non-alloy steel, has the highest *PRODY* value because it holds a substantial share of Luxembourg's exports, and this country has the highest per capita GDP in our sample.

Table 4 and Figure 3 summarize some basic descriptive statistics for *EXPY*. We note that the mean *EXPY* for the sample of countries included exhibits a downward trend over time. Mean *EXPY* has fallen from \$12,994 in 1992 to \$10,664 in 2003. Since the income levels associated with individual products are held constant over time (as explained above), this is due partly to the changing composition of the sample of countries (with more low-*EXPY* countries being included over time) and partly to the reduction in *EXPY* levels in many of the countries. Indeed, Table 5 shows that a majority of countries (among those that have *EXPY* values throughout our sample period) have experienced a reduction in *EXPY* over time. This downward trend may be specific to the recent period, since we do not see a similar trend since the 1960s when we use 4-digit trade data.

How does *EXPY* vary across countries? Figure 4 shows a scatterplot of *EXPY* against per-capita GDP. Unsurprisingly, there is a very strong correlation between these two variables. The correlation coefficient between the two is in the range 0.80-0.83 depending on the year. Rich (poor) countries export products that tend to be exported by other rich (poor) countries. Although in our framework this relationship has a different interpretation, it can also be explained with the Heckscher-Ohlin framework if rich country goods are more intensive in human capital or physical capital. The relationship between *EXPY* and per capita GDP exists partly by construction, since a commodity's *PRODY* is determined by the per capita GDPs of the countries that are important exporters of that commodity. However, the relationship is not just a mechanical one. Calculating country specific *PRODY*s by excluding own exports from the calculation of these measures does not change the results much. Note also that the variation in *EXPY* across countries is much lower than the variation in per-capita GDPs. This is a direct consequence of the fact that *PRODY* (and therefore *EXPY*) is a weighted average of national income levels.

Table 6 shows the countries with smallest and largest *EXPY* values for 2001 (the year with the largest possible sample size). Note that French Polynesia (PYF) ranks in the top 5 among those with the largest *EXPY*. This surprising outcome arises in part because cultured pearl exports contribute heavily to a French Polynesia's export basket and this product has a relatively large *PRODY* value of \$22,888. A few other cases where countries appear to have very large *EXPY* values relative to per capita GDP are Mozambique (MOZ), Swaziland (SWZ), Armenia (ARM), India (IND), and China (CHN). In a couple of these instances, the culprit is once again a specific commodity with a high *PRODY* value: unwrought, alloyed aluminum for Mozambique and "mixed odoriferous substances in the food and drink industries" for Swaziland. But in the remaining cases (China, India, and Armenia), this is the result of a portfolio

of a high *PRODY* exports, and not one or two specific items. At first sight, diamonds seem to play a large role in India and Armenia, but both countries retain their high *EXPY*s even with diamonds removed from the calculation. And China has a very diversified set of exports, with no single product category standing out in terms of high export shares. It is worth remembering at this juncture that China and India have both been experiencing very rapid economic growth (as has Armenia more recently) .

Figure 5 shows the time trend for *EXPY* for China, India, and a sample of other Asian and Latin American countries. Among the Latin American countries included (Argentina, Brazil, Chile, and Mexico), only Mexico has a level of *EXPY* that is comparable to those in East Asia. This probably reflects the fact that the exports of the other three are heavily based on primary products and natural resources, which tend to have lower *EXPY*s. Chile has the lowest *EXPY* by far, and its *EXPY* has been steadily drifting downwards. At the other end, South Korea and Hong Kong have the highest *EXPY*s. Note how China has significantly closed the gap with these countries over time. China's *EXPY* has converged with that of Hong Kong, even though Hong Kong's per capita GDP remains five times larger (in PPP-adjusted terms). And China's *EXPY* now exceeds those of Brazil, Argentina, and Chile by a wide margin, even though China's per-capita GDP is roughly half as large as those of the Latin American countries. India's *EXPY* is not as spectacular as China's, but that is in large part because our measure is based on commodity exports and does not capture the explosion in India's software exports. Nonetheless, by 2003 India had a higher *EXPY* than not only Chile, but also Argentina, a country that is roughly four times richer.

Do all natural-resource exporting countries have low *EXPY*s? Figure 6 shows a similar chart for five primary-product exporting countries: Canada, Norway, New Zealand, Australia, and Chile. The variation in *EXPY* among these countries turns out to be quite large. Once again, Chile is at the bottom of the scale. But even among the remaining four advanced countries, the range is quite wide. Canada's *EXPY* is between 20-25 percent larger than Norway's or Australia's. Therefore, our measure seems to capture important differences among primary product exporting countries as well.

3.4 Determinants of *EXPY*

What might be some of the fundamental determinants of the variation across countries in levels of *EXPY*? We have shown above that *EXPY* is highly correlated with per-capita GDP. The model laid out in the early part of the paper suggests that specialization patterns will be determined both by fundamentals and by idiosyncratic elements. Among fundamentals, the model pointed to human capital and the size of the labor force as two key determinants. The first extends the range of "discoverable" goods, and the second promotes cost discovery through (initially) lower wages. We find support for both of these implications in the cross-national data. Human capital and country size (proxied by population) are both associated positively with *EXPY*, even when we

control for per capita GDP separately (Table 7). It may be difficult to give the relationship with human capital a direct causal interpretation, since the causal effect may go from *EXPY* to human capital rather than vice versa. But it is easier to think of the relationship with country size in causal terms: it is hard to believe that there would be reverse causality from *EXPY* to population size. Interestingly, institutional quality (proxied by the Rule of Law index of the World Bank, a commonly used measure of institutional quality) does not seem to be strongly associated with *EXPY* once we control for per capita GDP (Table 7, column 3). This makes it less likely that *EXPY* is a proxy for broad institutional characteristics of a country.

Even if we ascribe a causal role to per-capita income and human capital, there is a lot that remains unexplained in the determination of *EXPY*. Figure 7 shows a scatter plot of deviations from the cross-country norms established in column 4 of Table 7 against per capita GDP. There are big outliers in either direction, especially among low-income countries. Mozambique (+88 percent), Swaziland (+55 percent), and Senegal (+29 percent) have *EXPY* levels that are much higher than would be predicted on the basis of the right-hand side variables in Table 7, while Guinea (-66 percent), Niger (-55 percent), and Burundi (-57 percent) have much lower *EXPY*s. If indeed such differences matter to subsequent economic performance (and we claim that they do), it is important to understand where they arise from. Moreover, to the extent that *EXPY* levels exert an independent influence on per capita income levels and human capital stocks, the "unexplained" component of the cross-national variation in *EXPY* is naturally much larger. Hausmann and Rodrik (2003) provide some anecdotal evidence which suggests that successful new industries often arise for idiosyncratic reasons. Fundamentals are only part of the story.

3.5 *EXPY* and growth

We finally turn to the relationship between *EXPY* and economic growth. We analyze this relationship in both cross-national and panel settings and using a wide variety of estimation techniques.

Table 8 shows a set of cross-national regressions in which growth is regressed on initial values of *EXPY* and other regressors. The maximum time span that we can use for these regressions based on COMTRADE data is a time horizon of 11 years (1992-2003). However, this leaves us with a sample of only some 40 odd countries. By focusing on a somewhat shorter time horizon—between 1994 and 2003—we can nearly double the sample of countries included in the regression. The table shows results with both samples. All regressions include initial per-capita GDP as a covariate. Human capital and a rule of law index are also included in some of the specifications. Finally, we show both OLS and IV results. We appeal to the theory developed previously and the empirical results above in using country size (population and land area) as instruments in the IV specification. Country size is plausibly exogenous with respect to *EXPY* levels and economic growth. But excludability from the second-stage regression can be viewed as more problematic. Many endogenous growth theories contain scale

effects—operating through channels other than what we have emphasized here—and would in principle call for country size to be introduced as an independent regressor in growth regressions. We take comfort and refuge in the fact that it has been very difficult to find such scale effects in growth empirics. Rose (2006) has recently undertaken a comprehensive empirical analysis looking for such scale effects and reports decisively negative results.⁴ In light of such findings, our use of country size as an instrument seems plausible. We also note that we will use fixed-effects and an alternative instrumentation strategy when we turn to panel estimation.

EXPY enters with a large and positive coefficient that is statistically significant in all of these specifications. The estimated coefficient varies from 0.030 to 0.082, with IV estimates being larger than OLS estimates.⁵ Taking the mid-point of this range, the results imply that a 10 percent increase in *EXPY* boosts growth by half a percentage points, which is quite large. Figure 8 shows a representative scatter plot.

A shortcoming of these regressions is that the time horizon is short, and that they suffer, as with all cross-national specifications, from possible omitted variables bias. While 6-digit disaggregation based on COMTRADE does not allow us to examine pre-1992 data, 4-digit calculations based on World Trade Flows allows us to construct a panel going back to 1962. Table 9 shows results from panel regressions. Data are grouped into 5- and 10-year intervals and four different estimators are used: pooled OLS, IV, OLS with fixed effects (for countries and years), and GMM. (See notes at the bottom of the table for more details.) The estimated coefficient on *EXPY* is significant in all cases, with a magnitude that is comparable to that in the cross-section results reported above.⁶ The fixed effects results are particularly telling, since these explicitly control for time-invariant country characteristics and identify the impact of *EXPY* off the variation within countries. They are significant in both the 5- and 10-year panels. These fixed effects estimates suggest that a 10 percent increase in *EXPY* raises growth by 0.14 to 0.19 percentage points. This is a smaller effect than what we found in the cross-national specifications, but it is still noteworthy.

There is no reason a priori to expect that *EXPY* works the same way for

⁴Rose summarizes his results thus: "There is little evidence that countries with more people perform measurably better. Indeed, a good broad-brush characterization is that a country's population has no significant impact on its well-being" (2006, 15). The only exception that Rose notes is the well-known regularity that smaller countries have higher shares of trade in GDP.

⁵F-tests in IV specifications always indicate that instruments are jointly significant in the first stage. Overidentification tests using the J-statistic cannot reject excludability in columns (4)-(6). However, in columns (10)-(12) covering a shorter period, the null hypothesis of zero correlation of instruments with second-stage residuals is rejected in two of the three specifications.

⁶The variables used as instruments fail the overidentification test in columns (2) and (6), most likely because they are very persistent and are akin to country fixed effects in a panel. Reassuringly, columns (4) and (8) show that the GMM setup where lagged levels and differences are used as instruments passes both the overidentification test and exhibits no second-order correlation.

all countries, and the panel regressions allow us to check for heterogeneity in its estimated impact on growth across different country subgroups. Table 10 shows various panel specifications estimated separately for four different country groups distinguished by income levels: high-income OECD countries, upper middle-income countries (MIDUP), lower middle-income countries (MIDLW), and low income countries. We find that *EXPY* enters most strongly in countries at intermediate income levels. The fixed-effects point estimate for the MIDLW sub-sample suggests that a 10 percent increase in *EXPY* boosts growth by 0.35-0.37 percentage points, double the estimate for the sample as a whole and close to the cross-section estimate. Interestingly, *EXPY* never enters significantly in the OECD sub-sample. This is perhaps because rich countries have fairly stable *EXPY* values: the standard deviation of *EXPY* is half as large in the OECD sub-sample as it is in the rest of the sample. In fixed-effects regressions, the results in the lowest-income sub-sample are very poor as well, possibly reflecting considerable measurement error (in trade statistics over time) for this sub-sample. So with respect to the within-variation, *EXPY* does a much better job distinguishing performance among middle-income countries than among countries at either end of the income spectrum.

We have subjected these results to a large number of additional robustness tests, which we do not report for reasons of space. In particular, both the cross-national and panel results are robust to the inclusion of additional covariates such as distance from the equator, legal origin dummies and measures of financial development (e.g., private credit as a share of GDP). Even with these controls, *EXPY* remains statistically significant and of similar magnitude in each of the twelve equations in Table 8, except in the last three. In the panel, the additional controls do not materially change the significance or magnitude of *EXPY* in any of the 5-year results. All of the 10-year results are also preserved, except in the case of GMM, where the coefficient is no longer significant although its magnitude remains the same.

3.6 Discussion

Our results show that countries that export goods associated with higher productivity levels grow more rapidly, even after we control for initial income per head, human capital levels, and time-invariant country characteristics. What is the economic mechanism that drives this growth? In the simple model we sketched out, growth is the result of transferring resources from lower-productivity activities to the higher-productivity goods identified by the entrepreneurial cost-discovery process. An important characteristic of these goods is that there is elastic demand for them in world markets, so that a country can export them in large quantities without significant adverse terms-of-trade effects. As an indication of this mechanism, we find, for example, that countries with initially high levels of *EXPY* subsequently experience higher growth in exports (see Figure 9).

Fostering an environment that promotes entrepreneurship and investment in new activities would appear therefore to be critical to economic convergence.

From an allocative-efficiency standpoint, the key is that such activities generate information spillovers for emulators (on which see Hausmann and Rodrik [2003] for more discussion and evidence). A full discussion of the policy implications of this is beyond the scope of the present paper (see Rodrik [2004]). But, generically, the requisite policy is to subsidize initial entrants in new activities (but not followers).

More broadly, our results suggest that the type of goods in which a country specializes has important implications for subsequent economic performance. Everything else being the same, an economy is better off producing goods that richer countries export. Standard models of comparative advantage indicate that pushing specialization up the product scale in this fashion would be bad for an economy's health: it would simply distort production and create efficiency losses. The framework we developed in the paper, and the evidence that we offered, suggest an alternative interpretation. A country's fundamentals generally allow it to produce more sophisticated goods than it currently produces. Countries can get stuck with lower-income goods because entrepreneurship in cost discovery entails important externalities. Countries that are able to overcome these externalities—through policies that entice entrepreneurs into new activities—can reap the benefits in terms of higher economic growth.

4 Concluding remarks

What we have shown in this paper is that there are economically meaningful differences in the specialization patterns of otherwise similar countries. We have captured these differences by developing an index that measures the "quality" of countries' export baskets. We provided evidence that shows that countries that latch on to a set of goods that are placed higher on this quality spectrum tend to perform better. The clear implication is that the gains from globalization depend on the ability of countries to appropriately position themselves along this spectrum.

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Table 1: Sample size of *EXPY*

<i>Year</i>	<i>No. reporting countries</i>
1992	48
1993	65
1994	87
1995	99
1996	111
1997	119
1998	119
1999	126
2000	133
2001	133
2002	127
2003	122

Table 2: Descriptive statistics for *PRODY* (2000 US\$)

<i>Variable</i>	<i>No. obs.</i>	<i>Mean</i>	<i>Std. Dev.</i>	<i>Min</i>	<i>Max</i>
mean <i>PRODY</i> , 1999-2001, at market exchange rates	5023	11,316	6,419	153	38,573
mean <i>PRODY</i> , 1999-2001, PPP-adjusted	5023	14,172	6,110	748	46,860

Table 3: Largest and smallest *PRODY* values (2000 US\$)

	<i>product</i>	<i>product name</i>	<i>mean PRODY, 1999-2001</i>
smallest	140490	Vegetable products nes	748
	530410	Sisal and Agave, raw	809
	10120	Asses, mules and hinnies, live	823
	90700	Cloves (whole fruit, cloves and stems)	870
	90500	Vanilla beans	979
largest	721060	Flat rolled iron or non-alloy steel, coated with aluminium, width>600mm	46,860
	730110	Sheet piling of iron or steel	46,703
	721633	Sections, H, iron or non-alloy steel, nfw hot-roll/drawn/extruded > 80m	44,688
	590290	Tyre cord fabric of viscose rayon	42,846
	741011	Foil of refined copper, not backed, t < 0.15mm	42,659

Table 4: Descriptive statistics for *EXPY* (2000 US\$)

<i>Year</i>	<i>Obs.</i>	<i>Mean</i>	<i>Std. Dev.</i>	<i>Min</i>	<i>Max</i>
1992	48	12,994	4,021	5,344	20,757
1993	65	12,407	4,179	3,330	20,361
1994	87	11,965	4,222	2,876	20,385
1995	99	11,138	4,513	2,356	19,823
1996	111	10,950	4,320	2,742	20,413
1997	119	10,861	4,340	2,178	19,981
1998	119	11,113	4,621	2,274	20,356
1999	126	11,203	4,778	2,261	26,218
2000	133	10,714	4,375	1,996	25,248
2001	133	10,618	4,281	2,398	24,552
2002	127	10,927	4,326	2,849	24,579
2003	122	10,664	3,889	2,684	23,189

Table 5: Number of countries that show an increase/decrease in *EXPY*, 1992-2003

	<i>EXPY, ppp</i>	<i>EXPY, market XRs</i>
Increase	8	13
Decrease	37	32

Table 6: Countries with smallest and largest *EXPY*s

	<i>Reporter</i>	<i>EXPY</i>
<i>Smallest</i>	Niger	2,398
	Ethiopia	2,715
	Burundi	2,726
	Benin	3,027
	Guinea	3,058
<i>Largest</i>	Luxembourg	24,552
	Ireland	19,232
	Switzerland	19,170
	Iceland	18,705
	French Polynesia	18,550

Table 7: Correlates of *EXPY*

	(1)	(2)	(3)	(4)
	Dependent variable: log <i>EXPY</i> in 2001			
log GDP per capita	0.354 (14.75)**	0.298 (9.37)**	0.288 (6.96)**	0.282 (7.47)**
log human capital		0.281 (2.08)*	0.268 (1.79)	0.157 (1.16)
rule of law index			0.019 (0.41)	0.065 (1.58)
log population				0.089 (5.01)**
log land area				-0.032 (2.30)*
constant	6.090 (27.39)**	6.405 (26.45)**	6.497 (18.03)**	5.523 (14.66)**
Observations	131	102	101	100
R-squared	0.72	0.75	0.74	0.79

Robust t-statistics in parentheses

* significant at 5% level; ** significant at 1% level

Table 8: Cross-national growth regressions

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Dependent variable: growth rate of GDP per capita over 1992-2003						Dependent variable: growth rate of GDP per capita over 1994-2003					
	OLS	OLS	OLS	IV	IV	IV	OLS	OLS	OLS	IV	IV	IV
log initial GDP/cap	-0.015 (2.37)*	-0.019 (2.89)**	-0.022 (3.30)**	-0.017 (2.56)*	-0.025 (3.99)**	-0.027 (4.37)**	-0.008 (1.90)	-0.013 (2.78)**	-0.017 (3.40)**	-0.012 (1.44)	-0.018 (2.61)**	-0.022 (3.28)**
log initial EXPY	0.060 (3.96)**	0.056 (3.83)**	0.047 (2.74)**	0.072 (3.55)**	0.082 (4.13)**	0.080 (3.55)**	0.035 (3.05)**	0.034 (2.74)**	0.030 (2.36)*	0.046 (1.99)*	0.053 (2.55)*	0.051 (2.40)*
log human capital		0.028 (2.02)	0.017 (1.43)		0.024 (1.92)	0.019 (1.68)		0.021 (2.20)*	0.006 (0.54)		0.015 (1.45)	0.002 (0.20)
rule of law index			0.009 (1.86)			0.004 (0.73)			0.010 (2.37)*			0.009 (1.88)
constant	-0.419 (4.32)**	-0.357 (3.68)**	-0.242 (1.74)	-0.501 (3.62)**	-0.550 (3.78)**	-0.505 (2.76)**	-0.242 (3.15)**	-0.201 (2.36)*	-0.118 (1.21)	-0.305 (2.12)*	-0.323 (2.42)*	-0.264 (1.75)
F-statistic on instruments (first stage)				4.80	4.37	4.27				10.36	4.89	6.22
Hansen J-statistic (p-value)				0.89	0.73	0.87				0.02	0.04	0.13
Observations	46	43	43	44	42	42	85	69	68	76	68	67
R-squared	0.35	0.40	0.44				0.20	0.26	0.32			

Robust t-statistics in parentheses

Instruments for IV regressions: log population, log land area.

* significant at 5% level; ** significant at 1% level

Table 9: Panel growth regressions, 1962-2000

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
		5-year panels				10-year panels		
	OLS	IV	FE	GMM	OLS	IV	FE	GMM
log initial GDP/cap	-0.0117 (4.39)**	-0.0299 (4.78)**	-0.0272 (4.24)**	-0.0143 (2.65)**	-0.0128 (4.42)**	-0.0384 (4.37)**	-0.0318 (5.69)**	-0.0177 (2.37)*
log initial EXPY	0.0287 (5.38)**	0.0739 (5.06)**	0.0185 (2.26)*	0.0446 (4.10)**	0.0286 (5.22)**	0.0919 (4.54)**	0.0141 (1.97)*	0.0444 (2.29)*
log human capital	0.0068 (3.27)**	0.0041 (1.76)	0.0049 (1.08)	0.0035 (0.92)	0.0077 (3.75)**	0.0045 (1.75)	0.0038 (0.81)	0.0085 (1.23)
constant	-0.1146 (4.08)**	-0.3372 (4.68)**	0.0937 (1.35)	-0.2301 (3.91)**	-0.1076 (3.68)**	-0.4197 (4.25)**	0.164 (2.53)*	-0.2023 (1.75)
Hansen J-statistic (p-value)		0.000		0.51		0.001		0.09
Second-order serial correlation (p-value)				0.61				0.32
observations	604	604	604	604	299	299	299	299
R-squared	0.16		0.13		0.24		0.28	

Robust t-statistics in parentheses

All equations include period dummies. IV regressions use log population and log area as instruments. Fixed effects (FE) include dummies for countries. GMM is the Blundell-Bond System-GMM estimator using lagged growth rates and levels as instruments. The GMM estimation also uses log population and log area as additional instruments.

* significant at 5% level; ** significant at 1% level

Table 10: Panel growth regressions by income sub-groups
A: 5-year panels, 1962-2000

	(1) OECD	(4) MIDUP	(3) MIDLW	(2) LOW	(5) OECD	(8) MIDUP	(7) MIDLW	(6) LOW	(9) OECD	(12) MIDUP	(11) MIDLW	(10) LOW
	OLS				IV				FE			
log initial GDP/cap	-0.024 (2.87)**	-0.023 (2.75)**	-0.025 (3.89)**	-0.021 (3.00)**	-0.020 (1.34)	-0.040 (3.32)**	-0.039 (3.76)**	-0.031 (3.43)**	-0.035 (1.79)	-0.024 (1.78)	-0.040 (2.30)*	-0.022 (1.95)
log initial EXPY	0.002 (0.16)	0.020 (1.11)	0.028 (3.06)**	0.027 (2.85)**	-0.007 (0.25)	0.119 (2.34)*	0.088 (3.03)**	0.057 (3.11)**	-0.003 (0.15)	0.003 (0.15)	0.035 (2.03)*	0.016 (1.08)
log human capital	-0.002 (0.34)	0.015 (1.36)	-0.005 (0.91)	0.005 (1.82)	-0.002 (0.40)	-0.018 (0.83)	-0.002 (0.31)	0.003 (0.88)	-0.010 (0.44)	0.038 (1.61)	0.011 (0.85)	0.011 (1.61)
cons	0.247 (2.92)**	0.049 (0.39)	0.003 (0.05)	-0.052 (0.73)	0.295 (2.14)*	-0.597 (1.80)	-0.364 (2.06)*	-0.220 (1.98)*	0.398 (1.82)	0.150 (1.01)	0.079 (0.73)	0.040 (0.30)
observations	152	112	178	162	152	112	178	162	152	112	178	162
R-squared	0.48	0.22	0.21	0.15	0.48		0.01	0.09	0.57	0.51	0.34	0.28

B: 10-year panels, 1962-2000

	(1) OECD	(4) MIDUP	(3) MIDLW	(2) LOW	(5) OECD	(8) MIDUP	(7) MIDLW	(6) LOW	(9) OECD	(12) MIDUP	(11) MIDLW	(10) LOW
	OLS				IV				FE			
log initial GDP/cap	-0.029 (2.49)*	-0.031 (3.19)**	-0.030 (4.58)**	-0.023 (3.69)**	-0.026 (1.37)	-0.054 (3.52)**	-0.050 (3.34)**	-0.037 (3.85)**	-0.057 (3.45)**	-0.029 (2.27)*	-0.057 (3.73)**	-0.023 (2.28)*
log initial EXPY	0.008 (0.50)	0.021 (1.16)	0.029 (2.84)**	0.024 (2.84)**	0.001 (0.03)	0.157 (2.22)*	0.104 (2.54)*	0.070 (3.21)**	0.010 (0.35)	0.005 (0.28)	0.037 (2.36)*	0.013 (1.06)
log human capital	-0.001 (0.20)	0.017 (1.42)	-0.001 (0.14)	0.005 (1.85)	-0.002 (0.24)	-0.030 (0.89)	0.005 (0.64)	0.001 (0.43)	0.002 (0.13)	0.044 (1.94)	0.016 (1.08)	0.006 (1.02)
cons	0.241 (2.87)**	0.105 (0.78)	0.031 (0.49)	-0.010 (0.13)	0.274 (2.23)*	-0.789 (1.67)	-0.412 (1.72)	-0.274 (2.03)*	0.454 (2.02)*	0.163 (1.12)	0.192 (1.60)	0.082 (0.67)
observations	76	56	88	79	76	56	88	79	76	56	88	79
R-squared	0.59	0.32	0.31	0.19	0.59				0.74	0.69	0.56	0.52

Robust t-statistics in parentheses

* significant at 5% level; ** significant at 1% level

Figure 1: The production space

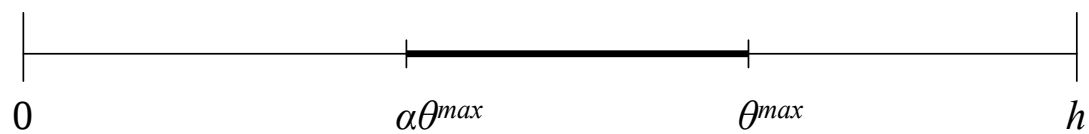


Figure 2: Equilibrium and comparative dynamics

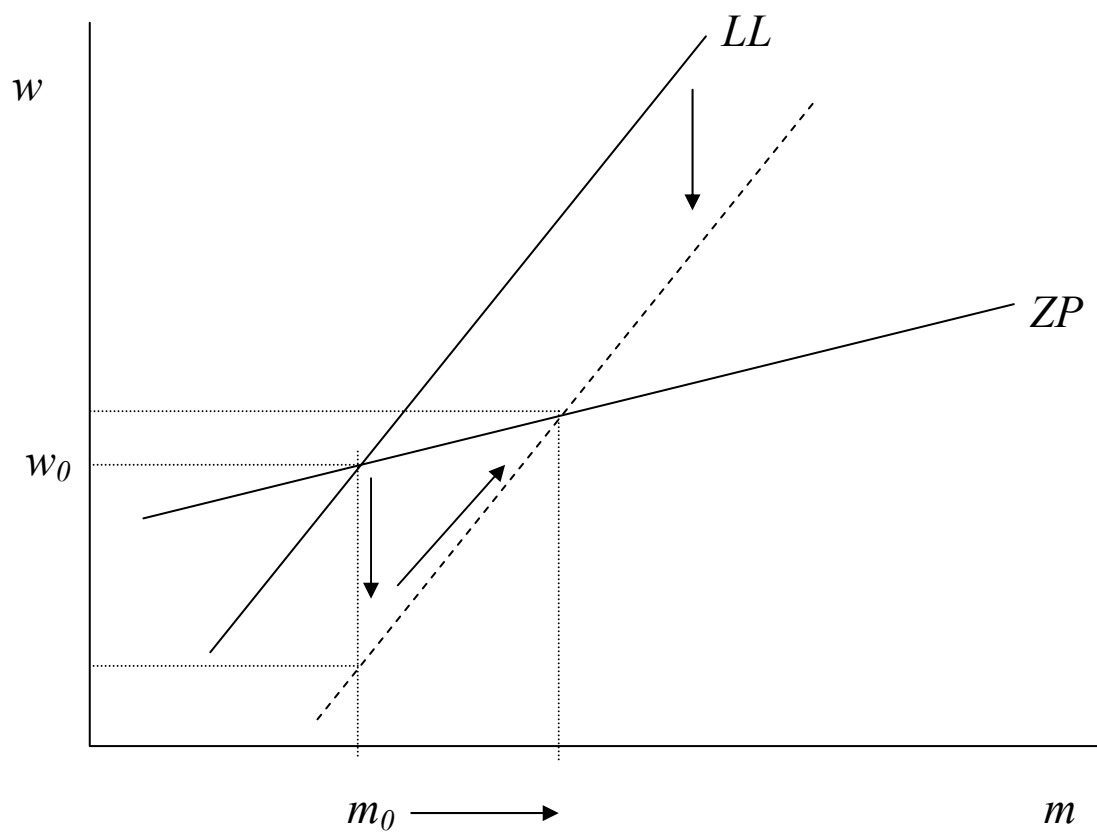


Figure 3: How *EXPY* varies over time

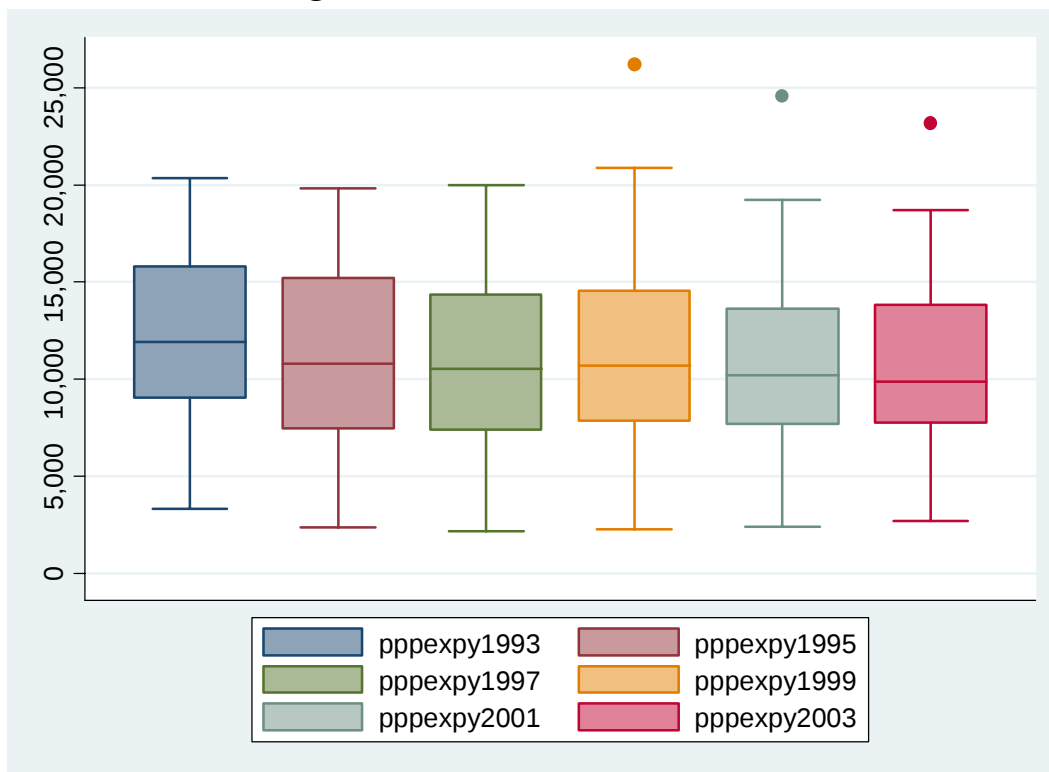


Figure 4: Relationship between per-capita GDP and *EXPY*, 2003

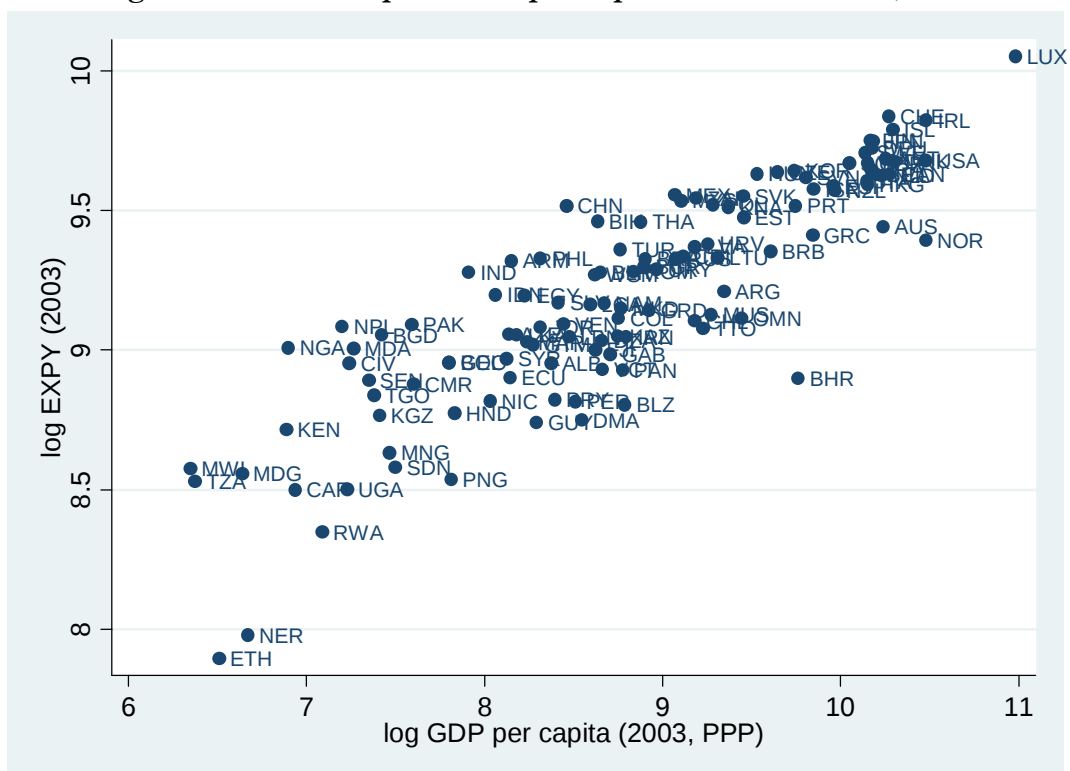


Figure 5: *EXPY* over time for selected countries

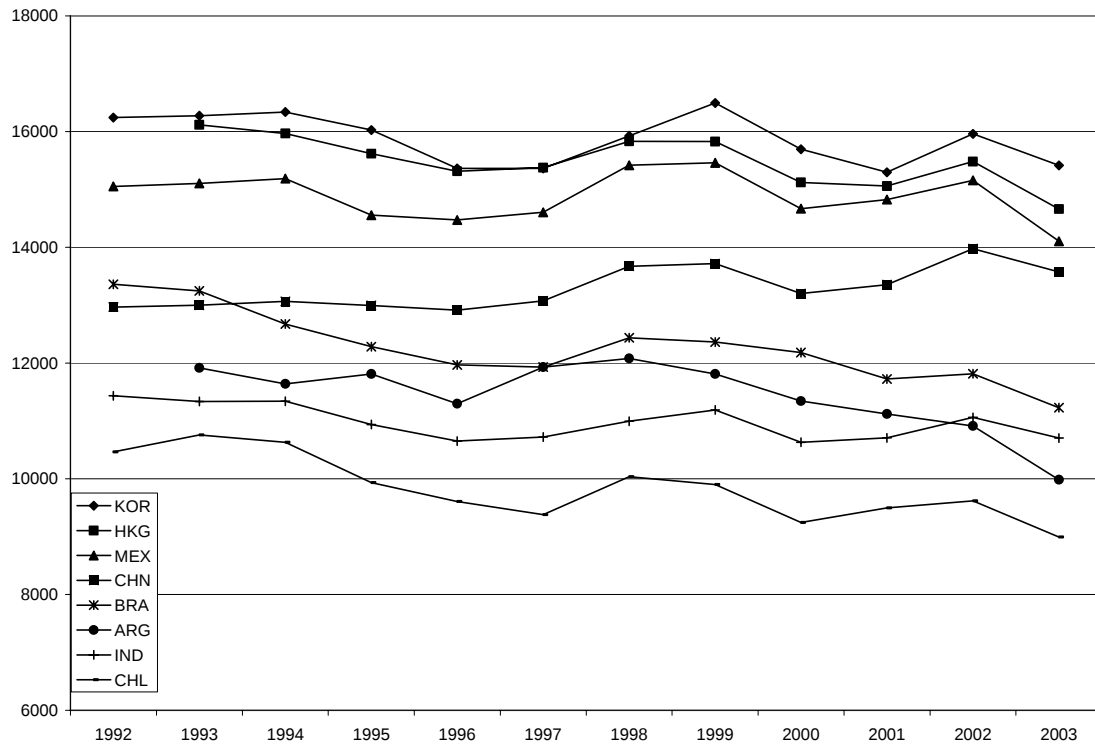


Figure 6: *EXPY* over time for natural-resource exporting countries

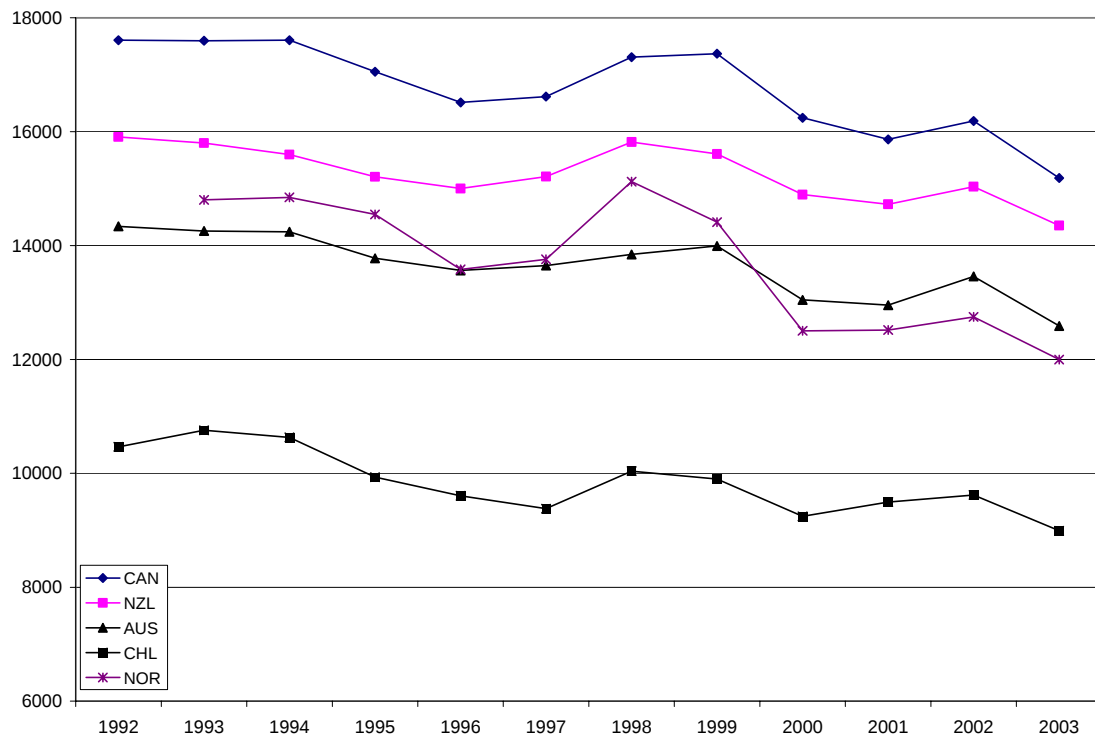


Figure 7: Deviations from cross-national norm for *EXPY*
(Percent differences from the regression specification in Table 7, column 4)



Figure 8: Partial relationship between *EXPY* and subsequent growth (Table 8, col. 5)

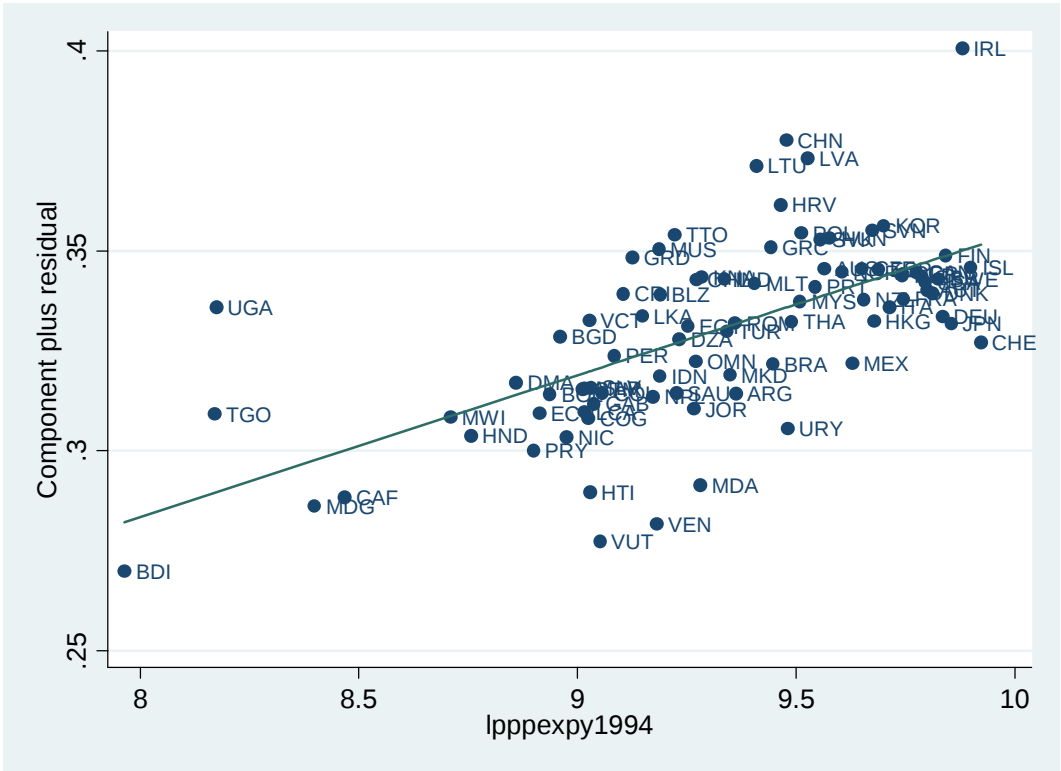
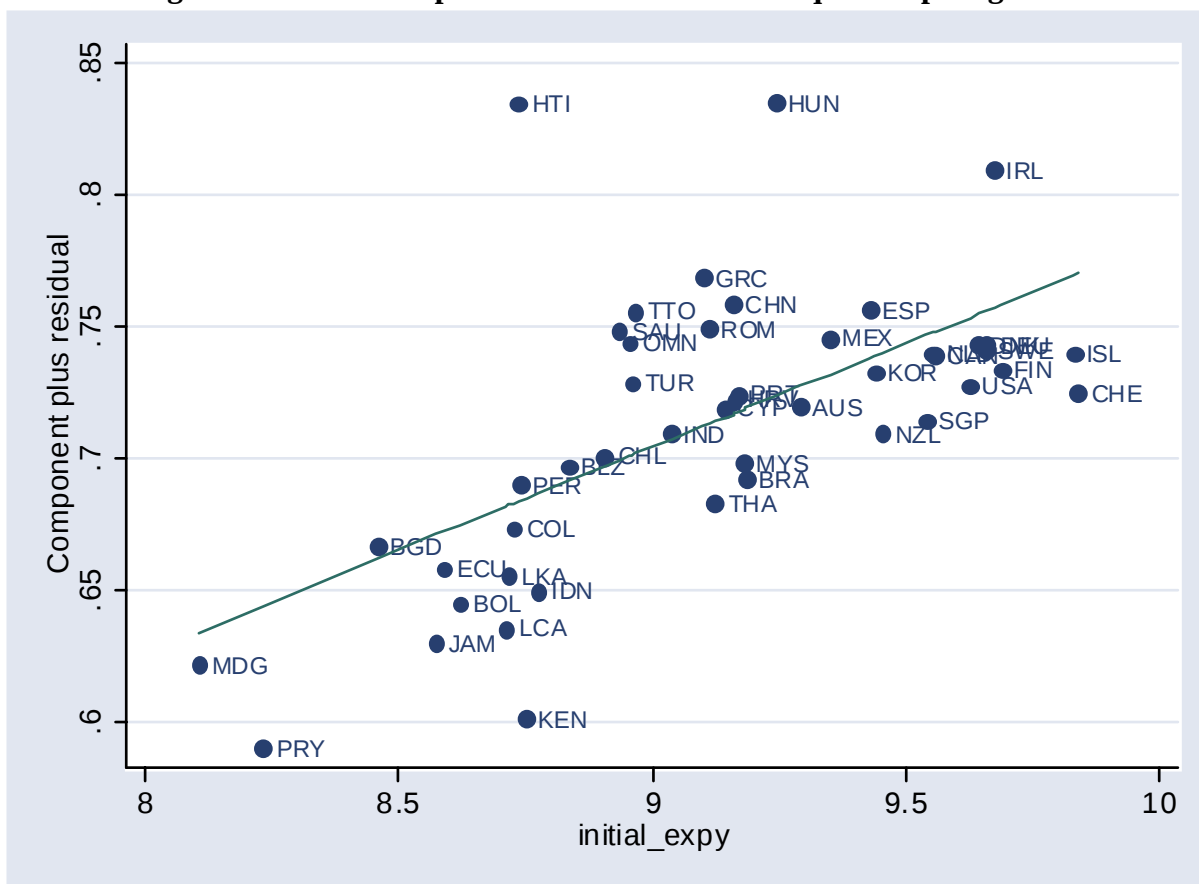


Figure 9: Relationship between *EXPY* and subsequent export growth



Note: This chart shows growth in exports over 1992-2003 as a function of the 1992 level of *EXPY* (controlling for initial income).

INSTITUTIONS RULE: THE PRIMACY OF INSTITUTIONS OVER
GEOGRAPHY AND INTEGRATION IN ECONOMIC DEVELOPMENT

Dani Rodrik
Harvard University

Arvind Subramanian
IMF

Francesco Trebbi
Harvard University

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ABSTRACT

We estimate the respective contributions of institutions, geography, and trade in determining income levels around the world, using recently developed instruments for institutions and trade. Our results indicate that the quality of institutions “trumps” everything else. Once institutions are controlled for, measures of geography have at best weak direct effects on incomes, although they have a strong indirect effect by influencing the quality of institutions. Similarly, once institutions are controlled for, trade is almost always insignificant, and often enters the income equation with the “wrong” (i.e., negative) sign, although trade too has a positive effect on institutional quality. We relate our results to recent literature, and where differences exist, trace their origins to choices on samples, specification, and instrumentation.

The views expressed in this paper are the authors’ own and not of the institutions with which they are affiliated. We thank Chad Jones, James Robinson, Will Masters, and participants at the Harvard-MIT development seminar and the Harvard econometrics workshop for their comments, Daron Acemoglu for helpful conversations, and Aart Kraay for providing us with his data. Dani Rodrik gratefully acknowledges support from the Carnegie Corporation of New York.

Commerce and manufactures can seldom flourish long in any state which does not enjoy a regular administration of justice, in which the people do not feel themselves secure in the possession of their property, in which the faith of contracts is not supported by law, and in which the authority of the state is not supposed to be regularly employed in enforcing the payment of debts from all those who are able to pay. Commerce and manufactures, in short, can seldom flourish in any state in which there is not a certain degree of confidence in the justice of government.

-- Adam Smith, Wealth of Nations

I. Introduction

Average income levels in the world's richest and poorest nations differ by a factor of more than 100. Sierra Leone, the poorest economy for which we have national income statistics, has a per-capita GDP of \$490, compared to Luxembourg's \$50,061.¹ What accounts for these differences, and what (if anything) can we do to reduce them? It is hard to think of any question in economics that is of greater intellectual significance, or of greater relevance to the vast majority of the world's population.

In the voluminous literature on this subject, three strands of thoughts stand out. First, there is a long and distinguished line of theorizing that places geography at the center of the story. Geography is a key determinant of climate, endowment of natural resources, disease burden, transport costs, and diffusion of knowledge and technology from more advanced areas. It exerts therefore a strong influence on agricultural productivity and the quality of human resources. Recent writings by Jared Diamond and Jeffrey Sachs are among the more notable works in this tradition (see Diamond 1997; Gallup, Sachs, and Mellinger 1998, and Sachs 2001).

A second camp emphasizes the role of international trade as a driver of productivity change. We call this the integration view, as it gives market integration, and impediments thereof, a starring role in fostering economic convergence between rich and poor regions of the world. Notable recent research in this camp includes Frankel and Romer (FR,1999) and the pre-geography work of Sachs (Sachs and Warner 1995).

Finally, a third group of explanations centers on institutions, and in particular the role of property rights and the rule of law. In this view, what matters are the rules of the game in a society and their conduciveness to desirable economic behavior. This view is associated most strongly with Douglass North (1990). It has received careful econometric treatment recently in Hall and Jones (1999), who focus on what they call "social infrastructure," and in

¹ These are figures for 2000, and they are expressed in current "international" dollars, adjusted for PPP differences. The source is the World Development Indicators CD-Rom of the World Bank.

Acemoglu, Johnson, and Robinson (AJR, 2001), who focus on the expropriation risk that current and potential investors face.

Growth theory has traditionally focused on physical and human capital accumulation, and, in its endogenous growth variant, on technological change. But accumulation and technological change are at best proximate causes of economic growth. No sooner have we ascertained the impact of these two on growth—and with some luck their respective roles also—that we want to ask: But why did some societies manage to accumulate and innovate more rapidly than others? The three-fold classification offered above—geography, integration, and institutions—allows us to organize our thoughts on the “deeper” determinants of economic growth. These three are the factors that determine which societies will innovate and accumulate, and therefore develop, and which will not.

Since long-term economic development is a complex phenomenon, the idea that any one (or even all) of the above deep determinants can provide an adequate accounting of centuries of economic history is, on the face of it, preposterous. Historians and many social scientists prefer nuanced, layered explanations where these factors interact with human choices and many other not-so-simple twists and turns of fate. But economists like parsimony. We want to know how well these simple stories do, not only on their own or collectively, but more importantly, vis-à-vis each other. How much of the astounding variation in cross-national incomes around the world can geography, integration, and institutions explain? Do these factors operate additively, or do they interact? Are they all equally important? Does one of the explanations “trump” the other two?

The questions may be simple, but devising a reasonable empirical strategy for answering them is far from straightforward. This is not because we do not have good empirical proxies for each of these deep determinants. There are many reasonable measures of “geography,” such as distance from the equator (our preferred measure), percentage land mass located in the tropics, or average temperature. The intensity of an economy’s integration with the rest of the world can be measured by flows of trade or the height of trade barriers. The quality of institutions can be measured with a range of perceptions-based indicators of property rights and the rule of law. The difficulty lies instead in sorting out the complex web of causality that entangles these factors.

The extent to which an economy is integrated with the rest of the world and the quality of its institutions are both endogenous, shaped potentially not just by each other and by geography, but also by income levels. Problems of endogeneity and reverse causality plague any empirical researcher trying to make sense of the relationships among these causal factors. We illustrate this with the help of Figure 1, adapted from Rodrik (2003, forthcoming). The plethora of arrows in the figure, going in both directions at once in many cases, exemplifies the difficulty.

The task of demonstrating causality is perhaps easiest for the geographical determinists. Geography is as exogenous a determinant as an economist can ever hope to get, and the main burden here is to identify the main channel(s) through which geography influences economic

performance. Geography may have a direct effect on incomes, through its effect on agricultural productivity and morbidity. This is shown with arrow (1) in Figure 1. It can also have an indirect effect through its impact on distance from markets and the extent of integration (arrow [2]) or its impact on the quality of domestic institutions (arrow [3]). With regard to the latter, economic historians have emphasized the disadvantageous consequences for institutional development of certain patterns of factor endowments, which engender extreme inequalities and enable the entrenchment of a small group of elites (e.g., Engerman and Sokoloff, 1994). A similar explanation, linking ample endowment of natural resources with stunted institutional development, also goes under the name of “resource curse.”

Trade fundamentalists and institutionalists have a considerably more difficult job to do, since they have to demonstrate causality for their preferred determinant, as well as identify the effective channel(s) through which it works. For the former, the task consists of showing that arrows (4) and (5)—capturing the direct impact of integration on income and the indirect impact through institutions, respectively—are the relevant ones, while arrows (6) and (7)—reverse feedbacks from incomes and institutions, respectively—are relatively insignificant. Reverse causality cannot be ruled out easily, since expanded trade and integration can be mainly the result of increased productivity in the economy and/or improved domestic institutions, rather than a cause thereof.

Institutionalists, meanwhile, have to worry about different kinds of reverse causality. They need to show that improvements in property rights, the rule of law and other aspects of the institutional environment are an independent determinant of incomes (arrow [8]), and are not simply the consequence of higher incomes (arrow [9]) or of greater integration (arrow [5]).

In econometric terms, what we need to sort all this out are good instruments for integration and institutions—sources of exogenous variation for the extent of integration and institutional quality, respectively, that are uncorrelated with other plausible (and excluded) determinants of income levels. Two recent papers help us make progress by providing plausible instruments. FR (1999) suggests that we can instrument for actual trade/GDP ratios by using trade/GDP shares constructed on the basis of a gravity equation for bilateral trade flows. The FR approach consists of first regressing bilateral trade flows (as a share of a country’s GDP) on measures of country mass, distance between the trade partners, and a few other geographical variables, and then constructing a predicted aggregate trade share for each country on the basis of the coefficients estimated. This constructed trade share is then used as an instrument for actual trade shares in estimating the impact of trade on levels of income.

Acemoglu, Johnson, and Robinson (AJR, 2001) use mortality rates of colonial settlers as an instrument for institutional quality. They argue that settler mortality had an important effect on the type of institutions that were built in lands that were colonized by the main European powers. Where the colonizers encountered relatively few health hazards to European settlement, they erected solid institutions that protected property rights and established the rule of law. In other areas, their interests were limited to extracting as much resources as quickly as possible, and they showed little interest in building high-quality institutions. Under the added assumption that institutions change only gradually over time, AJR argue

that settler mortality rates are therefore a good instrument for institutional quality. FR (1999) and AJR (2001) use their respective instruments to demonstrate strong causal effects from trade (in the case of FR) and institutions (in the case of AJR) to incomes. But neither paper embeds their estimation in the broader framework laid out above. More specifically, AJR control for geographical determinants, but do not check for the effects of integration. FR do not control for institutions.

Our approach in this paper consists of using the FR and AJR instruments simultaneously to estimate the structure shown in Figure 1. The idea is that these two instruments, having passed what might be called the AER (American Economic Review)-test, are our best hope at the moment of unraveling the tangle of cause-and-effect relationships involved. So we systematically estimate a series of regressions in which incomes are related to measures of geography, integration, and institutions, with the latter two instrumented using the FR and AJR instruments. These regressions allow us to answer the question: what is the independent contribution of these three sets of deep determinants to the cross-national variation in income levels? The first stage of these regressions provides us in turn with information about the causal links among the determinants.

This exercise yields some sharp and striking results. Most importantly, we find that the quality of institutions trumps everything else. Once institutions are controlled for, integration has no direct effect on incomes, while geography has at best weak direct effects. Trade often enters the income regression with the “wrong” (i.e., negative) sign, as do many of the geographical indicators. By contrast, our measure of property rights and the rule of law always enters with the correct sign, and is statistically significant, often with t-statistics that are very large.

On the links among determinants, we find that institutional quality has a positive and significant effect on integration. Importantly, integration also has a (positive) impact on institutional quality, suggesting that trade can have an indirect effect on incomes by improving institutional quality. Our results also tend to confirm the findings of Easterly and Levine (2002), namely that geography exerts a significant effect on the quality of institutions.

Our preferred specification “accounts” for about half of the variance in incomes across the sample, with institutional quality (instrumented by settler mortality) doing most of the work. Our estimates indicate that an increase in institutional quality of one standard deviation, corresponding roughly to the difference between measured institutional quality in Bolivia and South Korea, produces a 2 log-points rise in per-capita incomes, or a 6.4-fold difference—which, not coincidentally, is also roughly the income difference between the two countries. In our preferred specification, trade and distance from the equator both exert a negative, but insignificant effect on incomes (see Table 2, panel B, column 6).

Much of our paper is devoted to checking the robustness of our central results. In particular, we estimate our model for three different samples: (a) the original 64-country sample used by AJR; (b) an 80-country sample which is the largest sample we can use while still retaining the AJR instrument; and (c) a 140-country sample that maximizes the number of countries at

the cost of replacing the AJR instrument with two more widely available instruments (fractions of the population speaking English and Western European languages as the first language, from Hall and Jones, 1999.) We also use a large number of alternative indicators of geography, integration, and institutions. In all cases, institutional quality emerges as the clear winner of the “horse race” among the three. Finally, we compare and contrast our results to those in some recent papers that have undertaken exercises of a similar sort. Where there are differences in results, we identify and discuss the source of the differences and explain why we believe our approach is superior on conceptual or empirical grounds.

The plan of the paper is as follows. Section II presents the benchmark results. Section III discusses related recent work and compares it to ours. Section IV provides a more in-depth interpretation of our results and lays out a research agenda.

II. Benchmark Results

A. Data and Descriptive Statistics

Table 1 provides descriptive statistics for the key variables of interest. The first column covers the sample of 80 countries for which data on settler mortality have been compiled by AJR.² Given the demonstrated attractiveness of this variable as an instrument that can help illuminate causality, this will constitute our preferred sample. The second column contains summary statistics for a larger sample of 140 countries for which we have data on alternative instruments for institutions (fractions of the population speaking English and other European languages). Data for the FR instrument on trade, on which we will rely heavily, are also available for this larger sample.

GDP per capita on a PPP basis for 1995 will be our measure of economic performance. For both samples, there is substantial variation in GDP per capita: for the 80-country sample, mean GDP in 1995 is \$3020, the standard deviation of log GDP is 1.05, with the poorest country’s (Congo, DRC) GDP being \$321 and that of the richest (Singapore) \$ 28,039. For the larger sample, mean income is \$4452, the standard deviation is 1.14, with the richest country (Luxembourg) enjoying an income level of \$34,698.

The institutional quality measure that we use is due to Kaufmann, Kraay, and Zoido-Lobaton (2002). This is a composite indicator of a number of elements that capture the protection afforded to property rights as well as the strength of the rule of law.³ This is a standardized

² AJR actually compiled data on settler mortality for 81 countries, but data on per capita PPP GDP for 1995 are unavailable for Afghanistan.

³ AJR use an index of protection against expropriation compiled by Political Risk Services. The advantage of the rule of law measure used in this paper is that it is available for a larger sample of countries, and in principle captures more elements that go toward determining

(continued)

measure that varies between -2.5 (weakest institutions) and 2.5 (strongest institutions). In our sample of 80 countries, the mean score is -0.25, with Zaire (score of -2.09) having the weakest institutions and Singapore (score of 1.85) the strongest.

Integration, measured using the ratio of trade to GDP, also varies substantially in our sample. The average ratio is 51.5 percent, with the least “open” country (India) posting a ratio of 13 percent and the most “open” (Singapore) a ratio of 324 percent. Our preferred measure of geography is a country’s distance from the equator (measured in degrees). The typical country is about 15.2 degrees away from the equator.

B. OLS and IV Results in the core specifications

Our paper represents an attempt to estimate the following equation:

$$\log y_i = \mu + \alpha \text{INS}_i + \beta \text{INT}_i + \gamma \text{GEO}_i + \varepsilon_i \quad (1)$$

where y_i is income per capita in country i , INS_i , INT_i , and GEO_i are respectively measures for institutions, integration, and geography, and ε_i is the random error term. Throughout the paper, we will be interested in the size, sign, and significance of the three coefficients α , β , and γ . We will use standardized measures of INS_i , INT_i , and GEO_i in our core regressions, so that the estimated coefficients can be directly compared.

Before we discuss the benchmark results, it is useful to look at the simple, bivariate relationships between income and each of the “deep determinants.” Figure 2 shows these scatter plots, with the three panels on the left hand side corresponding to the sample of 80 countries and the three panels on the right to the larger sample of 140 countries. All the plots show a clear and unambiguously positive relationship between income and its possible determinants. Thus, any or all of them have the potential to explain levels of income. This positive relationship is confirmed by the simple OLS regression of equation (1) reported in Panel A of Table 2. The signs of institution, openness, and geography are as expected and statistically significant or close to being so. Countries with stronger institutions, more open economies, and more distant from the equator are likely to have higher levels of income.

To get a sense of the magnitude of the potential impacts, we can compare two countries, say Nigeria and Mauritius, both in Africa. If the OLS relationship is indeed causal, the coefficients in column (6) of Panel A in Table 2 would suggest that Mauritius’s per capita GDP should be 5.2 times that of Nigeria, of which 21 percent would be due to better institutions, 65 percent due to greater openness, and 14 percent due to better location. In practice, Mauritius’s income (\$11,400) is 14.8 times that of Nigeria (\$770).

institutional quality. In any case, measures of institutional quality are highly correlated: in our 80-country sample, the two measures have a simple correlation of 0.78.

Of course, for a number of reasons described extensively in the literature—reverse causality, omitted variables bias, and measurement error—the above relationship cannot be interpreted as causal or accurate. To address these problems, we employ a two-stage least squares estimation procedure. The identification strategy is to use the AJR settler mortality measure as an instrument for institutions and the FR measure of constructed trade shares as an instrument for integration. In the first-stage regressions, INS_i and INT_i are regressed on all the exogenous variables. Thus:

$$INS_i = \lambda + \delta SM_i + \phi CONST_i + \psi GEO_i + \varepsilon_{INS_i} \quad (2)$$

$$INT_i = \theta + \sigma CONST_i + \tau SM_i + \omega GEO_i + \varepsilon_{INT_i} \quad (3)$$

where SM_i refers to settler mortality and $CONST_i$ to the FR instrument for trade/GDP. The exclusion restrictions are that SM_i and $CONST_i$ do not appear in equation 1.

Equations (1)-(3) are our core specification. This specification represents, we believe, the most natural framework for estimating the respective impacts of our three deep determinants. It is general, yet simple, and treats each of the three deep determinants symmetrically, giving them all an equal chance. Our proxies for institutions, integration, and geography are the ones that the advocates of each approach have used. Our instruments for institutions and integration are sensible, and have already been demonstrated to “work” in the sense of producing strong second-stage results (albeit in estimations not embedded in our broader framework).

Panel B of Table 2 reports the two-stage least squares estimates of the three coefficients of interest. The estimation is done for three samples of countries: (i) for the sample of 64 countries analyzed by AJR; (ii) for an extended sample of 80 countries for which AJR had compiled data on settler mortality; and (iii) for a larger sample of 140 countries that includes those that were not colonized. In AJR, the quality of institutions was measured by an index of protection against expropriation. We use a rule of law index because it is available for a larger sample. The IV estimates of the coefficient on institutions in the first three columns of Panel B are very similar to those in AJR, confirming that these two indexes are capturing broadly similar aspects of institutions, and allowing us to use the larger sample for which data on settler mortality are available.

Columns (4)-(6) report our estimates for the extended AJR sample (which as we shall explain below will be our preferred sample in this paper). Columns (5) and (6) confirm the importance of institutions in explaining the cross-country variation in development. Once the institutional variable is added, geography and openness do not have any additional power in explaining development. Institutions trump geography and openness. In our preferred specification (column (6)), not only are institutions significant, their impact is large, and the estimated coefficients on geography and openness have the “wrong” sign! The coefficient on institutions in the IV estimation is nearly three times as large as in the corresponding OLS estimation (2 versus 0.7), suggesting that the attenuation bias from measurement error in the

institution variables swamps the reverse causality bias that would tend to make the OLS estimates greater than the IV estimates.

The results are similar for the larger sample of countries (Panel B, columns (6) to (9)). In this sample, we follow Hall and Jones (1998) and Dollar and Kraay (2002) in using the following two variables as instruments for institutional quality (in lieu of settler mortality): ENGFRAC, fraction of the population speaking English, and EURFRAC, fraction of the population speaking other European languages. Once again, institutions trump geography and openness, although the size of the estimated coefficient is smaller than that for the smaller sample. Figure 3 plots the conditional relationship between income and each of the three determinants for the 80-country (left panels) and 140-country (right panels) samples. In contrast to Figure 2, which showed a positive partial relationship between income and all its determinants, Figure 3 shows that only institutions have a significant and positive effect on income once the endogenous determinants are instrumented.

The first-stage regressions (reported in Panel C) are also interesting. In our preferred specification, settler mortality has a significant effect on integration: the coefficient is correctly signed and significant at the 1 percent level. This result holds for the range of specifications that we estimate as part of the robustness checks reported below. The geography variable has a significant impact in determining the quality of institutions as does integration, although its coefficient is significant only at the 5 percent level.

While all three samples provide qualitatively similar results, our preferred sample will be the 80-country sample: obviously this sample Pareto-dominates the 64-country sample. We also prefer this sample to the 140-country sample because settler mortality appears to be a superior instrument to those used in the 140-country sample (ENGFRAC and EURFRAC). Panel B shows that the instruments for the IV regressions in the 140-country sample fail to pass the over-identification tests despite the well-known problems of these tests having low power. Indeed, this turns out to be true not just for the core specifications in Table 2, but for many of the robustness tests that we discuss below. This raises questions about the results in Hall and Jones (1998) and in Dollar and Kraay (2002), which are based on the use of ENGFRAC and EURFRAC as instruments for institutions. Thus, while it is reassuring that the main result regarding the primacy of institutions also holds in the larger sample, we will focus mainly on the 80-country sample in the rest of the paper (referring to results for the larger sample in passing). We shall examine the robustness of our main results in the next section.

Columns (10) and (11) show the inter-relationships between integration and institutions in the 80-country sample. We regress trade and institutional quality separately on geography and on each other (instrumenting the endogenous variables in the manner discussed previously). The IV regressions show that each of these exerts a positive impact on the other, with the larger quantitative impact being that of institutional quality on trade. A unit increase in institutional quality increases the trade share by 0.77 units, while a unit increase in trade increases institutional quality by 0.23 units. Hence these estimates suggest that integration can have an indirect effect on incomes via its effect on institutional quality.

Taking these indirect effects into account, we can calculate the total impacts on incomes of these two determinants by combining the estimated parameters. Our estimates of α and β (the direct effects) in our preferred sample and specification are 2.00 and -0.30 , respectively (column 6). We can solve the system of equations implied by the additional results in columns (10) and (11) to calculate the total effects on log incomes of “shocks” to the error terms in the institutions and trade equations.

The results are as follows. If we consider the point estimates in equation (6) as our best estimate of the various effects, a unit (positive) shock to the institutional quality equation ultimately produces an increase in log incomes of 2.15; a unit (positive) shock to the trade equation ultimately produces an increase in log incomes of 0.2. This is a ten-fold difference. Alternatively, we could consider the direct impact of trade on income to be nil, since the relevant estimate (β) is statistically indistinguishable from zero. Under this assumption, a unit shock to the institutional quality equation ultimately produces an increase in log incomes of 2, while a unit shock to the trade equation produces an increase in log incomes of 0.46. Institutions trump integration by a factor of 4.4.

The much greater impact of institutions is the consequence of three factors: (i) the estimated direct effect of institutions on incomes is positive and large; (ii) the estimated direct effect of trade on incomes is negative (but statistically insignificant); and (iii) the estimated effect of trade on institutions is positive, but small.

The proximate determinants of economic growth are accumulation (physical and human) and productivity change. How do the deep determinants influence these channels? To answer this question, we regressed income per worker and its three proximate determinants, physical capital per worker, human capital per worker, and total factor productivity (strictly speaking a labor-augmenting technological progress parameter) on the deep determinants. Data for the left hand side variables for these regressions (i.e. income, physical, and human capital per worker, and factor productivity) are taken from Hall and Jones (1998). These results are reported in Table 3 for both the 80-country sample (columns 1-4) and the 140-country sample (columns 5-9).⁴ Three features stand out.

First, the regression for income per worker is very similar to the regressions for per capita income reported in Table 2, with institutions exerting a positive and significant effect on income, while integration and geography remain insignificant. Second, and interestingly, the same pattern holds broadly for the accumulation and productivity regressions; that is, institutions are an important determinant of both accumulation and productivity, while integration and geography are not influential in determining either accumulation or

⁴ Sample sizes are reduced because of the unavailability of the independent variables for all countries.

productivity.⁵ Finally, it is interesting to note that institutions have a quantitatively larger impact on physical accumulation than on human capital accumulation or productivity; for example, in the 80-country sample the coefficient on physical capital accumulation is about six times greater than on human capital accumulation and about 3.2 times greater than on productivity. One possible interpretation is that these results emphasize the particularly important role that institutions play in preventing expropriability of property which serves as a powerful incentive to invest and accumulate physical capital.

C. Robustness checks

Tables 4, 5, and 6 present our robustness checks. In Table 4 we test whether our results are driven by certain influential observations or by the 4 neo-European countries in our sample (Australia, Canada, New Zealand, and Australia), which are arguably different from the rest of the countries included. We also check to see whether the inclusion of regional dummies affects the results.

In columns (1)* and (1)** of Table 4 we use the Belsey-Kuh-Welsch (1980) test to check whether individual observations exert unusual leverage on the coefficient estimates, discarding those which do so. In the specification without regional dummies ((1)*), two observations—Ethiopia and Singapore—are influential. Once these are dropped, the coefficient estimate for institutions not only remains statistically unaffected, but increases in magnitude. In the equation with regional dummies, the test requires the observation for Ethiopia to be omitted, and the revised specification yields results very similar to the baseline specification, with the coefficient estimate on institutions remaining strong and significant. The inclusion of regional dummies for Latin America, Sub-Saharan Africa, and Asia tends to lower somewhat the estimated coefficient on institutions, but its significance level remains unaffected. Note also that none of the regional dummies enters significantly, which is reassuring regarding the soundness of our parsimonious specification.

The tests for influential observations suggest that there is no statistical basis for discarding neo-European countries. Nevertheless to confirm that these countries are not driving the results, we re-estimated the baseline specification without these observations. As the column labeled (1)*** confirms, the coefficient estimates are unaffected; indeed, once again the size of the coefficient on institutions rises substantially, suggesting the greater importance of institutions for the non-neo-European colonized countries. The remaining columns confirm that our results are robust also for the larger sample of countries.

We then check whether our results are robust to the inclusion of dummies for legal origin (column (3)), for the identity of colonizer (column (4)), and religion (column (5)). La Porta et. al. (1999) argue that the type of legal system historically adopted in a country or imported

⁵ In the larger sample, integration has a negative and significant effect on income and accumulation but this result is not robust to the inclusion of additional variables such as land and area.

through colonization has an important bearing on the development of institutions and hence on income levels. Similar claims are made on behalf of the other variables. In all cases, while these variables themselves tend to be individually and in some cases jointly significant, their inclusion does not affect the core results about the importance of institutions and the lack of any direct impact of geography and integration on incomes. Indeed, controlling for these other variables, the coefficient of the institutions variable increases: for example, in the 80-country sample, this coefficient increases from 2 in the baseline to 2.38 when the legal origin dummies are included.⁶

In Table 5 we check whether our particular choice of measure for geography (distance from the equator) influences our results. We successively substitute in our baseline specification a number of measures of geography used in the literature. These measures include percent of a country's land area in the tropics (TROPICS), access to the sea (ACCESS), number of frost days per month in winter (FROSTDAYS), the area covered by frost (FROSTAREA), whether a country is an oil exporter (OIL), prevalence of malaria (MALFAL94), and mean temperature (MEAN TEMPERATURE). The variables FROSTDAYS and FROSTAREA are taken from Masters and McMillan (2001), who argue that the key disadvantage faced by tropical countries is the absence of winter frost. (Frost kills pests, pathogens and parasites, thereby improving human health and agricultural productivity.) We find that none of these variables, with the exception of the oil dummy, is statistically significant in determining incomes. Equally importantly, they do not change qualitatively our estimates of the institution variable, which remains significant, nor of the integration variable, which remains insignificant and "wrongly" signed.⁷

In columns (9), (10), and (11), we test whether geography has an impact through a combination of effects captured by the different geography variables. In equation (9), we control jointly for distance from equator and the malaria variable. The p-value for the joint significance of the two geographical variables is well below one percent. The same happens when this specification is expanded to include the number of frost days per month in winter

⁶ We do not report the results for the larger sample but they are very similar. For the 80-country sample, interesting results are obtained for some of the individual legal origin and other variables. For example, as in AJR (2001), the French legal origin dummy has a positive total effect on incomes; the total impact of having been colonized by the UK is negative and statistically significant even though former UK-colonies have better quality of institutions on average. As for religion, well, suffice it to say that Weber is not vindicated!

⁷ In six of the eight regressions (excluding the one with the oil dummy), the geography variable is a significant determinant of institutions in the first stage regressions.

(column (10)). The F-test for joint significance of the geography pool rejects the null of no significant effect in the second stage.⁸

However, when we slightly enlarge the pool to include the other two geography variables, tropical area and mean temperature, all the individual effects become insignificant as does the joint significance of all the geography variables (the corresponding p-value is 15 percent). As for individual effects, in columns (9) and (10), malaria seems to be important in explaining income differences and enters significantly at the 5 or 10 percent level.⁹ But its coefficient is about 4 times smaller than that for institutions. Finally, we experimented with a series of specifications (not reported) that involved interacting the different geography variables with each other as well as introducing different functional forms (for example, exponential) for them. These did not provide evidence in favor of significant direct effects of geography on income. Overall, we conclude that there seems to be some, albeit modest, support for the direct impact of geography on income. The first stage regressions, however, point clearly in favor of an important indirect role of geography via institutions.

In Table 6, we check whether our results are sensitive to our omission of market size variables, or our measures of and instruments for openness. Frankel and Romer (1999) argue that smaller countries tend to trade more, and that one should therefore control for country size when looking for the effect of trade on incomes. The column labeled (1) in Table 6 includes two measures of country size—area and population. These variables do not have additional explanatory power in the income equation, which is different from the results in Frankel and Romer (1999). The size and significance of the coefficient on institutions are unaffected. The coefficient on openness becomes positive, but is highly insignificant. Column (3) replicates this exercise for the larger sample. The coefficient on institutions does not change qualitatively (but the standard error is sharply reduced as is the coefficient estimates), while the coefficient on openness is still negatively signed.

Alcalá and Ciccone (AC, 2002) argue that “real openness”, measured as the ratio of trade to PPP GDP is a better measure of integration than the simple ratio of trade to GDP that FR and we favor. In the next section, we examine in greater detail the merits of their argument, but here we test empirically whether this alternative measure affects our results. Column (5) presents the results. Once again, this integration measure is wrongly signed and insignificant, while the coefficient on institutions increases in size and remains significant, albeit at the 5 percent level.

⁸ In the corresponding first stage regressions, settler mortality continues to be important even after controlling for malaria prevalence, with F-statistics above 12 in both equations (9) and (10).

⁹ We note, however, that it is difficult to treat malaria incidence as an exogenous variable; as the successful eradication of malaria from Mauritius, Singapore, and Southern Italy demonstrates, it is obviously influenced by institutions.

Columns (2), (4) and (6) replicate the three robustness checks described above but with an instrument for openness that is slightly different from that in Frankel and Romer (1999). To obtain their instruments, FR estimated a gravity equation with the dependent variable defined as trade to PPP GDP. Strictly speaking therefore, theirs was an appropriate instrument for AC's "real openness." We re-estimated the gravity equation on the original FR sample of 63 countries, with trade to GDP as the dependent variable. We then used the coefficients from this gravity equation to construct the instrument for openness for all the 140 countries in our larger sample. The results in columns (2), (4), and (6) are very similar to those using the original FR instruments. The choice of instruments thus does not affect our main results.

Finally, in column (7) we substitute a "policy" measure for the trade variable. For reasons explained later, we believe that it is not appropriate to use policy variables in level regressions. We nevertheless sought to test the robustness of our results to one of the most-widely used measures in the trade and growth literature due to Sachs and Warner (1995), which has been endorsed recently by Krueger and Berg (2002).¹⁰ The results show that the institutional variable remains significant at the 5 percent level and the Sachs-Warner measure is itself wrongly signed like the other openness measures.

III. Recent Related Work

The present paper represents in our view the most systematic attempt to date to estimate the relationship between integration, institutions, and geography, on the one hand, and income, on the other. Recently a few other papers have carried out somewhat similar analyses and deserve discussion. The three papers we focus on are Easterly and Levine (EL, 2002), Alcalá and Ciccone (AC, 2002), and Dollar and Kraay (DK, 2002).¹¹ Our reading of EL is that it is largely consistent with our results, although, as we shall discuss, the interpretations are somewhat different. The results reported in AC and DK are at variance with ours to a much greater extent, but in different ways. AC claim trade and institutions are both significant, while DK claim that the instrumented income-level regressions exhibit too much collinearity between the two determinants for their respective contributions to be ascertained. We will identify in this section the specific departures from the framework we laid out in this paper that account for the divergent results that these authors have found. In particular, we will show that the differences derive from choices on samples, specification, or instruments that

¹⁰ The shortcomings of the Sachs-Warner index as a measure of trade policy are discussed at length in Rodriguez and Rodrik (2001).

¹¹ See also Frankel and Rose (2002), which builds on FR. This paper is critiqued by Rodrik (2000), who argues that the results are not robust to the exclusion of two highly influential variables (Hong Kong and Singapore) and the inclusion of institutional quality and geography as additional regressors.

we think are arbitrary. But the point of identifying the origin of the difference is to allow the reader to make up his/her own mind.

A. Easterly and Levine (EL, 2002)

The EL approach is in some ways very similar to that in this paper. EL estimate regressions of the levels of income on various measures of endowments, institutions, and “policies.” They find that institutions exert an important effect on development, while endowments do not, other than through their effect on institutions. Policies also do not exert any independent effect on development. The main differences between our paper and EL are the following.

First, we use a larger sample of countries (80 and 140) to run the “horse” race between the three possible determinants. The EL sample is restricted to 72 countries. Second, EL do not test in any detail whether integration has an effect on development. For them, integration or open trade policy is part of a wider set of government policies that can affect development. Testing for the effect of policies in level regressions is, however, problematic as discussed in greater detail below. Policies pursued over a short time span, say 30-40 years, are like a flow variable, whereas development, the result of a much longer cumulative historical process, is more akin to a stock variable. Thus, level regressions that use policies as regressors conflate stocks and flows. Testing for integration is less vulnerable to this critique because of the instrumentation strategy for measuring integration, which relies essentially on geography variables that are time-invariant.

Finally, we also differ from EL in the interpretation of the results. EL tend to a deterministic view of institutions, interpreting settler mortality, which is essentially an econometric instrument for capturing the exogenous source of variation in institutions, as a causal geographical determinant of institutions. As we show below, this would render institutions more immutable than they have actually proven to be.

B. Alcalá and Ciccone (AC, 2002)

The key innovation in AC is the advocacy and justification of what they call “real openness” as a better measure for integration. They first note that the FR result on the significance of trade in determining income is not robust to the inclusion of distance from equator in the income equation.¹² They then argue that part of the problem is that the conventional measure of openness that FR and others use—nominal trade divided by nominal GDP—can yield an estimate of trade on productivity that is biased downwards. The logic is as follows. Suppose that an increase in trade raises productivity, but that it does so predominantly in the tradables

¹² The estimated coefficient (t-statistic) on openness in the second stage FR equation drops from 1.97 (1.99) to 0.34 (0.41) when distance is added. See Rodriguez and Rodrik (2001, Table 7) and Irwin and Trevio (2000). Note that FR (1999, 389) reported in their robustness checks that their results were unaffected by the inclusion of distance from equator. However, this statement seems to have been erroneous, as the “distance” variable used in the FR regression was apparently latitude rather than the appropriate transformation $\text{abs}(\text{latitude})/90$.

sector. Unless non-tradables are inferior in demand, this will raise the relative price of non-tradables. This will in turn tend to depress the ratio of trade to nominal GDP. The result is that the initial increase in the openness ratio will be attenuated. AC therefore prefer to use what they call “real openness,” nominal trade divided by PPP GDP.

AC find a relationship between “real openness” and income within their empirical framework that they claim is more robust than when the conventional measure of openness is used. This seems to be the case even when institutional quality is entered, which shows up significantly in their regressions as well. Since we were unable to obtain their data set, we could not replicate their results exactly. However, as columns 5 and 6 of Table 6 illustrate, the use of “real openness” within our empirical specification does not alter the central results of our paper, namely the importance of institutions and the insignificance of openness.

Moreover, the AC argument strikes us as being misleading. To see why, first note that the use of “real openness” can yield in fact an opposite, and potentially more severe, bias. What AC do not recognize is that the actual null hypothesis that is tested is that trade does not cause productivity. Under that null, AC’s real openness measure generates a positive correlation between income and openness that is entirely spurious. In effect, the AC adjustment has the consequence that any and all increases in the productivity of tradables, regardless of source, can produce a rise in their measure of openness. Any increase in tradables productivity, whether driven by trade or not, will raise nontradables prices at home and the price level of an economy relative to others. “Adjusting” for this by using PPP GDP as the denominator drives up measured openness. The conventional measure of openness does not suffer from that shortcoming, and hence is preferable. We explain and illustrate this point in Appendix A using a simple model. We show, under fairly innocuous assumptions, that conventional openness will yield less biased results than real openness when productivity in the tradables sector is driven by non-trade factors.

The empirical counterpart of this point is that the AC measure of openness is much more strongly correlated with income levels than the conventional measure of openness. Note that real openness (Ropen) and openness (Open) are linked by the identity $\log \text{Ropen} = \log \text{Open} + \log P$, where P is a country’s price level. We know from the Balassa-Samuelson argument that P has a close relationship to a country’s income/productivity level. This is confirmed by the scatter plot in Figure (4), which shows the difference between these two measures (i.e., $\log \text{openness} - \log \text{“real openness”}$) plotted against income. The correlation is extremely high ($\rho = 0.75$). Under the null hypothesis that trade does not cause productivity, this association is spurious. And even under the null that trade does cause productivity, the observed association would be biased upwards unless the only cause of productivity changes is trade (see Appendix A).¹³

¹³ Indeed the AC argument that the true relationship between trade and productivity can be ascertained only by holding the price level constant suggests estimating a more general framework of the kind: $\log y = \alpha + \beta_1 \log \text{Open} + \beta_2 \log P + v$. When we do so, using an instrument set close to that in AC, we find that the coefficient on openness is negative and

(continued)

Our second point relates to the choice between real openness and openness on econometric grounds. Recall that the authors' original argument on behalf of Ropen is based on the idea that there is reverse causality from productivity to Open, via the price level. If the Frankel-Romer constructed trade share is a valid instrument, in the sense of being uncorrelated with productivity through any channel other than trade, any type of reverse causality—positive or negative—is already taken care of. The reverse causality that AC worry about should be handled by the instrument as well! For the authors' argument to be valid, instrumentation should fail when Open is used, but work when Ropen is used (even though the same instruments are used in both cases). The authors do not provide any justification for this, and it is unclear to us that any justification could be produced.

Moreover, it is possible that the AC strategy does exactly the reverse and that it weakens the instrument. As we mentioned above, we were unable to obtain AC's data and could not replicate their results exactly. But in our attempted replications of their baseline specification, we repeatedly found that the first-stage F statistics were lower, sometimes substantially so, when real openness was used in lieu of openness. In fact, the F-statistic was typically below 10 when real openness was used (and always above 10 when openness was used).¹⁴ On this ground alone, then, the AC strategy introduces an additional distortion to the estimation.¹⁵

In sum, we do not find the case for "real openness" particularly compelling. We worry that the "more robust" results that AC claim for it derive from the interaction of strong reverse causality with imperfections of the instrument.

insignificant, and that on the price level positive and highly significant. The comparable equation estimated with real openness yields a coefficient that is positive and significant. Whatever effect Ropen has on productivity, it seems to be operating via P, not via Open. So this more general framework yields little evidence that there is a significant causal effect from openness to productivity, holding the price level constant. Indeed, if we are to interpret these results literally, they suggest that causality runs from the price level to productivity.

¹⁴ Staiger and Stock (1997) recommend a threshold value of 10 for the F-statistic to be confident that the instruments retain their validity. These results are available upon request.

¹⁵ A little exploration reveals why the instruments work much better with openness than with real openness. The first stage regressions associated with estimating the equation described in footnote 13, which is based on the decomposition of real openness into openness and price, show that the first-stage for the price level equation has an F-statistic of 1.92. Apparently, the instruments do much worse with real openness because of the very weak correlation between the instrument set and the price level. Another issue is why AC use such an odd instrument list, entering the levels of population and land area, as well as their logs, whereas the second-stage equation has only the logs. It is hard to defend the idea that the level of land area, say, can be safely excluded from the second stage when its log belongs in it.

C. Dollar and Kraay (DK, 2002)

Recently DK have analyzed the interaction between institutions, trade, and growth.¹⁶ They do so by estimating both level regressions and regressions where the dependent variable is the change in the growth rate of income. Their main argument for undertaking the second approach is the alleged multicollinearity between instruments for institutions and trade that militates against a proper disentangling of the two effects. That is, although institutions and trade are jointly significant in level regressions, it is difficult to identify the strength of the individual effects. Since our own results do not suggest multicollinearity to be a problem, we discuss the reasons for the difference.

Level regressions: Equation (1) in Table 7, which reproduces equation 12 in table 1 of DK, is the prime exhibit for their contention that the individual effects of trade and institutions cannot be disentangled. The estimated coefficients on institutions and trade are both insignificant which is allegedly a reflection of multicollinearity. (But notice that the coefficient on openness is negative!) It should be noted that DK follow AC by measuring integration as “real openness.” In the subsequent columns labeled with asterisks, we show how non-robust this finding is, and conversely how robust is the finding relating to the primacy of institutions. Either deleting population from the DK specification (which is insignificant in any case) as in column (1) * or replacing “real openness” with openness (columns (1)**, (1)***, and (1)****) restores the importance of institutions (and with a vengeance as the very high t-values indicate), while openness remains insignificant. Also from Table 6, we know that our preferred specification is unaffected by inclusion of geography variables and by the use of “real openness.”

Moreover, DK’s own results with their larger, 134-country sample are fully consistent with ours: institutions are significant, “real openness” is not. This is shown in equation (2) in Table 7, which reproduces column (6) in DK’s Table 1. DK argue that that the significance of the institutions variable in this larger sample is not robust to the exclusion of the 4 neo-European countries. (See equation (3) in Table 6, which corresponds to DK’s column (7) in Table 1). DK provide no justification for why it is appropriate to exclude the neo-European countries from this sample. We have already established for our preferred sample (Table 3) that: (i) our results are robust to the exclusion of influential observations; (ii) there is no statistical reason to exclude the neo-European countries; and (iii) nevertheless, excluding them leaves our results unchanged. The columns with asterisks in Table 7 confirm this. In the larger sample with neo-Europes (columns (2)*, (2)**, and (2)***) as well as in the sample without neo-Europes (columns (3)* and (3)**) institutions trump integration if the DK equations are estimated without population or if openness is used to replace “real openness”. Thus, the case that multicollinearity blurs the individual effects of trade and institutions is a hard one to make: it requires us to favor a problematic specification with an arbitrarily selected sample over all others, and to disregard much evidence to the contrary.

¹⁶ Unlike EL, FR and our paper, DK place less emphasis on geography.

Change regressions: The DK change regressions are difficult to understand. The measures for institutional quality are puzzling and arbitrary, and the identification strategy not clearly justified. In Panel B of Table 7, we reproduce regressions involving each of their institutional variables. In each case, we re-estimate the equation adding time-region dummies. In every instance, the coefficients on real openness cease to be significant. What the results essentially indicate is that the 1980s were a lousy decade for Africa and Latin America and a good decade for Asia; there is no other information in these regressions beyond that.¹⁷

IV. What Does It All Mean?

In this section, we evaluate and interpret our results further. This also gives us an opportunity to make some additional comments on the related literature. We group the comments under three headings. First, we argue that an instrumentation strategy should not be confused with building and testing theories. Second, we relate our discussion on institutions to the discussion on “policies.” Third, we discuss the operational implications of the results.

A. An instrument does not a theory make

Insofar as our results emphasize the supremacy of institutions, they are very close to those in AJR. Note that we have gone beyond AJR by using larger sample sizes, and by including measures of integration in our estimation. We want to highlight another possible difference, having to do with the interpretation of the results. In particular, we want to emphasize the distinction between using an instrument to identify an exogenous source of variation in the independent variable of interest and laying out a full theory of cause and effect. In our view, this distinction is not made adequately clear in AJR and is arguably blurred by Easterly and Levine (2002).

One reading of the AJR paper, and the one strongly suggested by their title—“The Colonial Origins of Comparative Development”—is that they regard experience under the early period of colonization as a fundamental determinant of current income levels. While the AJR paper is certainly suggestive on this score, in our view this interpretation of the paper’s central

¹⁷ More broadly, as Lant Pritchett has pointed out in his comments on the paper, the DK regressions are simply *uninformative*. That is, running these particular regressions with these instrument sets provides little information that would alter one’s priors one way or the other. The appropriateness of some of the measures of institutional quality used by DK—revolutions and coups and war deaths, for example—is not clear, and it is highly doubtful that these are adequate instruments for measuring institutional change over time. Even leaving aside the insignificance of trade once time-region dummies are included, the instruments for institutions are simply too weak in these decadal regressions for the results to be of much use.

message would not be entirely correct. One problem is that AJR do not carry out a direct test of the impact of colonial policies and institutions. Furthermore, if colonial experience were the key determinant of income levels, how would we account for the variation in incomes among countries that had never been colonized by the Europeans?

To illustrate the second point, Figure 5 presents histograms of per-capita incomes for 163 countries for which we have data on per-capita GDP in 1995. The sample is split into two groups, a group of 103 countries that were colonized by one of the major Western European powers sometime before the twentieth century, and a group of 60 countries that were not colonized. The latter group includes some very high-income countries such as Finland and Luxembourg as well very poor countries such as Ethiopia,¹⁸ Yemen, and Mongolia. (Afghanistan is another low-income non-colonized country, but we do not have income data for it.) As the figure reveals, the dispersion of incomes within the colonized sample is not hugely different than that in the non-colonized sample. The standard deviations of log income per capita are 1.01 and 0.89 for the colonized and non-colonized samples, respectively. The income gaps that separate Ethiopia from Turkey, or China from Luxembourg are huge, and can obviously not be explained by any of these countries' colonial experience.

Where the AJR paper is successful is in the use of a plausible instrument to identify the causal relationship between institutional quality and income levels. An instrument is something that simply has some desirable statistical properties. It need not be a large part of the causal story. To illustrate the distinction between a theory and an instrument, here is an analogy that draws on a well-known paper by Angrist and Krueger (1991).

Angrist and Krueger (1991) use quarter of birth as an instrument for the level of educational attainment, to disentangle the effects of schooling on personal earnings from those of unobserved attributes (such as "ability"). The story is that compulsory schooling requirements, requiring schooling until age 16 or 17, interacting with school-entry requirements, imply variation in the level of schooling that is correlated with quarter of birth but not with other personal attributes. The authors show for example that students born in the first quarter of the year have a systematically lower level of average schooling in the population. This is a plausible strategy for identification, but it obviously does not imply a

¹⁸ Ethiopia was included in the AJR sample of colonies, even though this country has never been colonized. (It was occupied for a period of several years by Italy during 1936-1941, but this neither counts as colonization, nor could have had much to do with the settler mortality rates from the 19th century.) Excluding Ethiopia from the AJR sample makes no difference to the basic AJR results—and in fact it improves these results, as eyeballing AJR's Figure 1 and 2 would indicate.

quarter-of-birth theory of earnings. Similarly, the AJR strategy does not amount to a direct test of a colonial-origins theory of development.¹⁹

Easterly and Levine (2002) also assign a causal role to the settler mortality instrument and interpret it as a geographical determinant of institutions such as “crops and germs,” rather than viewing it as a device to capture the exogenous source of variation in institutions. Indeed, although they stress the role of institutions, they appear to come close to a geography theory of development. Thus, both AJR and EL tend to elevate settler mortality beyond its status as an instrument, with AJR favoring a colonial view of development and EL a geography-based theory of development.

B. The primacy of institutional quality does not imply policy ineffectiveness

Easterly and Levine (2002) assert that (macroeconomic) policies do not have an effect on incomes, once institutions are controlled for. Our view on the effectiveness of policy is similar to that expressed in AJR (1999, 1395): there are “substantial economic gains from improving institutions, for example as in the case of Japan during the Meiji Restoration or South Korea during the 1960s” or, one may add, China since the late 1970s. The distinction between institutions and policies is murky, as these examples illustrate. The reforms that Japan, South Korea, and China undertook were policy innovations that eventually resulted in a fundamental change in the institutional underpinning of their economies.

We find it helpful to think of policy as a flow variable, in contrast to institutions, which is a stock variable. We can view institutions as the cumulative outcome of past policy actions. Letting p_i denote policy on dimension i (i = fiscal, trade, monetary, etc.), I institutional quality, and δ the rate at which institutional quality decays absent countervailing action, the evolution of institutional quality over time can be written as $\dot{I} = \sum \alpha_i p_i - \delta I$, where α_i denotes the impact of policy i on institutional quality.

This suggests that it is inappropriate to regress income levels on institutional quality and policies, as Easterly and Levine (2002) do. The problem is not just that incomes move slowly while policies can take sudden turns. In principle this could be addressed by taking long-term averages of policies. (Easterly and Levine average their policy measures over a

¹⁹ AJR themselves are somewhat ambiguous about this. They motivate settler mortality as an instrument, but then their account gravitates towards a colonial origins theory of institutional development. And their title strongly suggests that they consider the contribution of their paper to have been a theory as opposed to an identification strategy. In personal communication, one of the authors has explained that the colonial experience allows them to exploit the *exogenous* source of variation in institutions and not all the variation. The fit of the first-stage regressions of about 25 percent leaves room for most of the variation to be explained by factors other than colonization.

number of decades.) It is that measures of institutional quality already contain all the relevant information about the impact of policies. If the appropriate specification for income is $\ln y = \beta I + u$, the effect of policies should be sought in a regression of the form $d \ln y / dt = \beta \dot{I} + v = \alpha_0 + \beta \sum \alpha_i p_i + v$. In other words, one should look for the effect of policies in a regression of growth of income on policies.

Moreover, a geography theory of institutions can understate the impact that policies can play in changing them over time. As an empirical matter, institutions have changed remarkably in the last three decades. For example, one indicator of institutional quality—the index measuring the constraint on the executive in the Gurr Polity IV dataset, which is available on a consistent basis for several decades—shows a marked improvement between the 1970s and 1990s. For 71 countries in our core sample, this index had a mean value of 3.21 in the 1970s, 3.52 in the 1980s, and 4.37 in the 1990s. A purely geographical theory of institutions would have difficulty in accounting for these changes. Indeed, if the first stage regressions reported in Panel C of Table 2 are run over the last three decades, the coefficient on settler mortality, declines from 0.94 in the 1970s to 0.87 in the 1980s and 0.71 in the 1990s, illustrating the mutability of institutions, and the declining importance of history (on the AJR interpretation of settler mortality) or geography (on the EL interpretation of settler mortality) in explaining the cross-national variation in institutions.

C. The hard work is still ahead

How much guidance do our results provide to policymakers who want to improve the performance of their economies? Not much at all. Sure, it is helpful to know that geography is not destiny, or that focusing on increasing the economy's links with world markets is unlikely to yield convergence. But the operational guidance that our central result on the primacy of institutional quality yields is extremely meager.

Our indicators of institutional quality are investors' and other observers' ratings of the institutional environment. They quantify these observers' views as to the likelihood that investors will retain the fruits of their investments, the chances that the state will expropriate them, or that the legal system will protect their property rights. While it is important to know that these ratings matter—and matter a great deal in fact—it remains unclear how the underlying evaluations and perceptions can be altered. In terms of the formulation developed above, what we have estimated is β , while what policy makers need to know are the α_i (policy impacts) for the policies at their disposal. In fact, since our identification strategies rely on exogenous sources of variation in these evaluations, they are doubly unhelpful from a policy perspective.

We illustrate the difficulty of extracting policy-relevant information from our findings using the example of property rights. Obviously, the presence of clear property rights for investors is a key, if not the key, element in the institutional environment that shapes economic performance. Our findings indicate that when investors believe their property rights are protected, the economy ends up richer. But nothing is implied about the actual form that property rights should take. We cannot even necessarily deduce that enacting a private

property-rights regime would produce superior results compared to alternative forms of property rights.

If this seems stretching things too far, consider the experiences of China and Russia. China still retains a socialist legal system, while Russia has a regime of private property rights in place. Despite the absence of formal private property rights, Chinese entrepreneurs have felt sufficiently secure to make large investments, making that country the world's fastest growing economy over the last two decades. In Russia, by contrast, investors have felt insecure, and private investment has remained low. Our institutional quality indicators bear this out, with Russia scoring considerably lower than China despite a formal legal regime that is much more in line with European norms than China's. Credibly signaling that property rights will be protected is apparently more important than enacting them into law as a formal private property rights regime.

So our findings do not map into a determinate set of policy desiderata. Indeed, there is growing evidence that desirable institutional arrangements have a large element of context specificity, arising from differences in historical trajectories, geography, political economy, or other initial conditions. As argued in Mukand and Rodrik (2002), this could help explain why successful developing countries—China, South Korea, and Taiwan among others—have almost always combined unorthodox elements with orthodox policies. It could also account for why important institutional differences persist among the advanced countries of North America, Western Europe, and Japan—in the role of the public sector, the nature of the legal systems, corporate governance, financial markets, labor markets, and social insurance mechanisms, among others.

It is important to underscore that this does not mean economic principles work differently in different places. We need to make a distinction between economic principles and their institutional embodiment. Most first-order economic principles come institution-free. Economic ideas such as incentives, competition, hard-budget constraints, sound money, fiscal sustainability, property rights do not map directly into institutional forms. Property rights can be implemented through common law, civil law, or, for that matter, Chinese-type socialism. Competition can be maintained through a combination of free entry and laissez-faire, or through a well-functioning regulatory authority. Macroeconomic stability can be achieved under a variety of fiscal institutions. Institutional solutions that perform well in one setting may be inappropriate in other setting without the supporting norms and complementary institutions. In the words of Douglass North:

“economies that adopt the formal rules of another economy will have very different performance characteristics than the first economy because of different informal norms and enforcement. The implication is that transferring the formal political and economic rules of successful Western economies to third-world and Eastern European economies is not a sufficient condition for good economic performance.” (North 1994, 366)

In addition, since policy makers always operate in second-best environments, optimal reform trajectories—even in apparently straightforward cases such as price reform—cannot be designed without regard to prevailing conditions and without weighting the consequences for multiple distorted margins.

Consequently, there is much to be learned still about what improving institutional quality means on the ground. This, we would like to suggest, is a wide open area of research. Cross-national studies of the present type are just a beginning that point us in the right direction.

Figure 1: The “deep” determinants of income

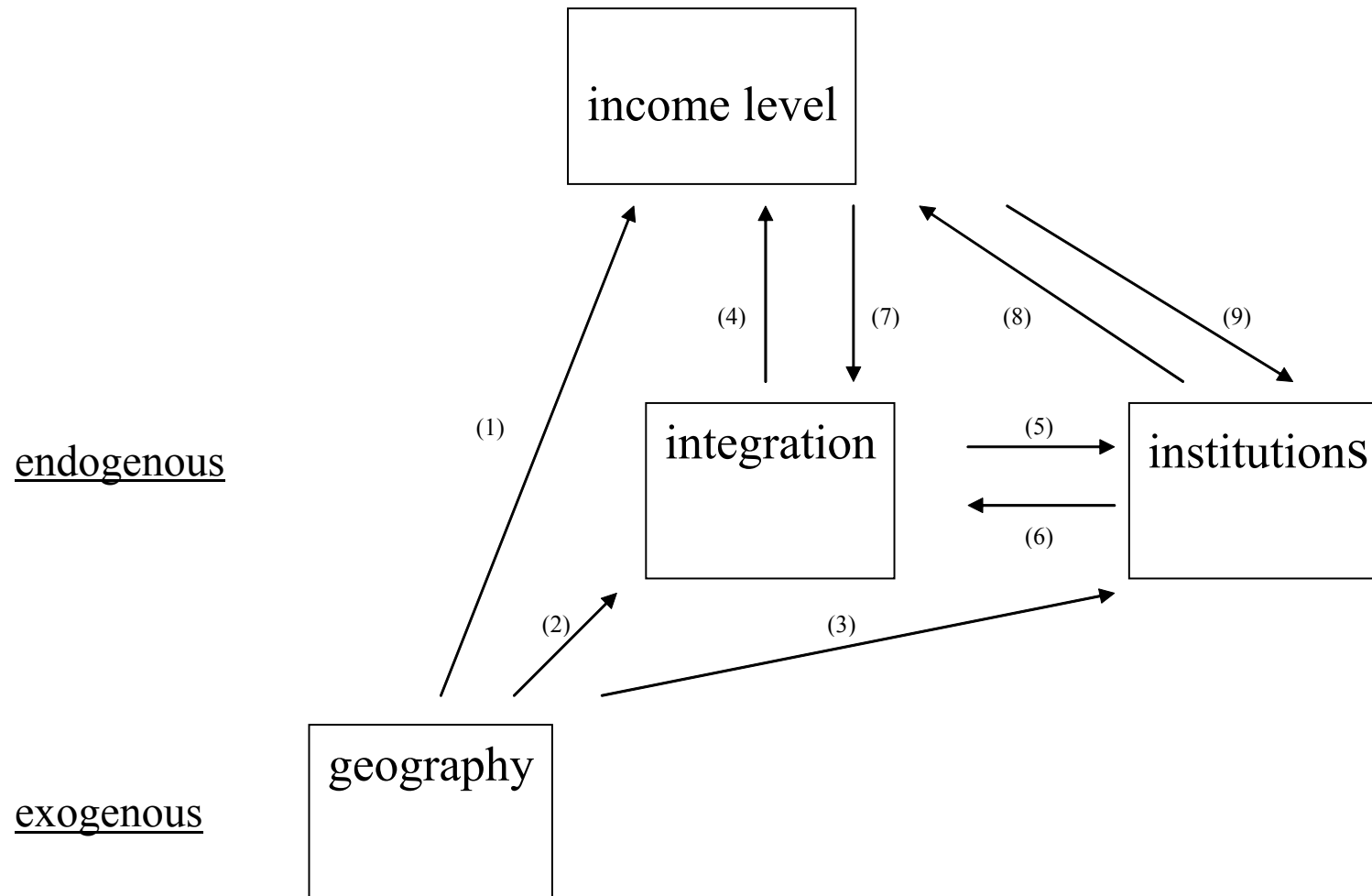


Figure 2: Simple Correlations between Income and its Determinants.
 (Sample of 80 countries for (a), (b), and (c); sample of 140 countries for (d), (e), and (f))

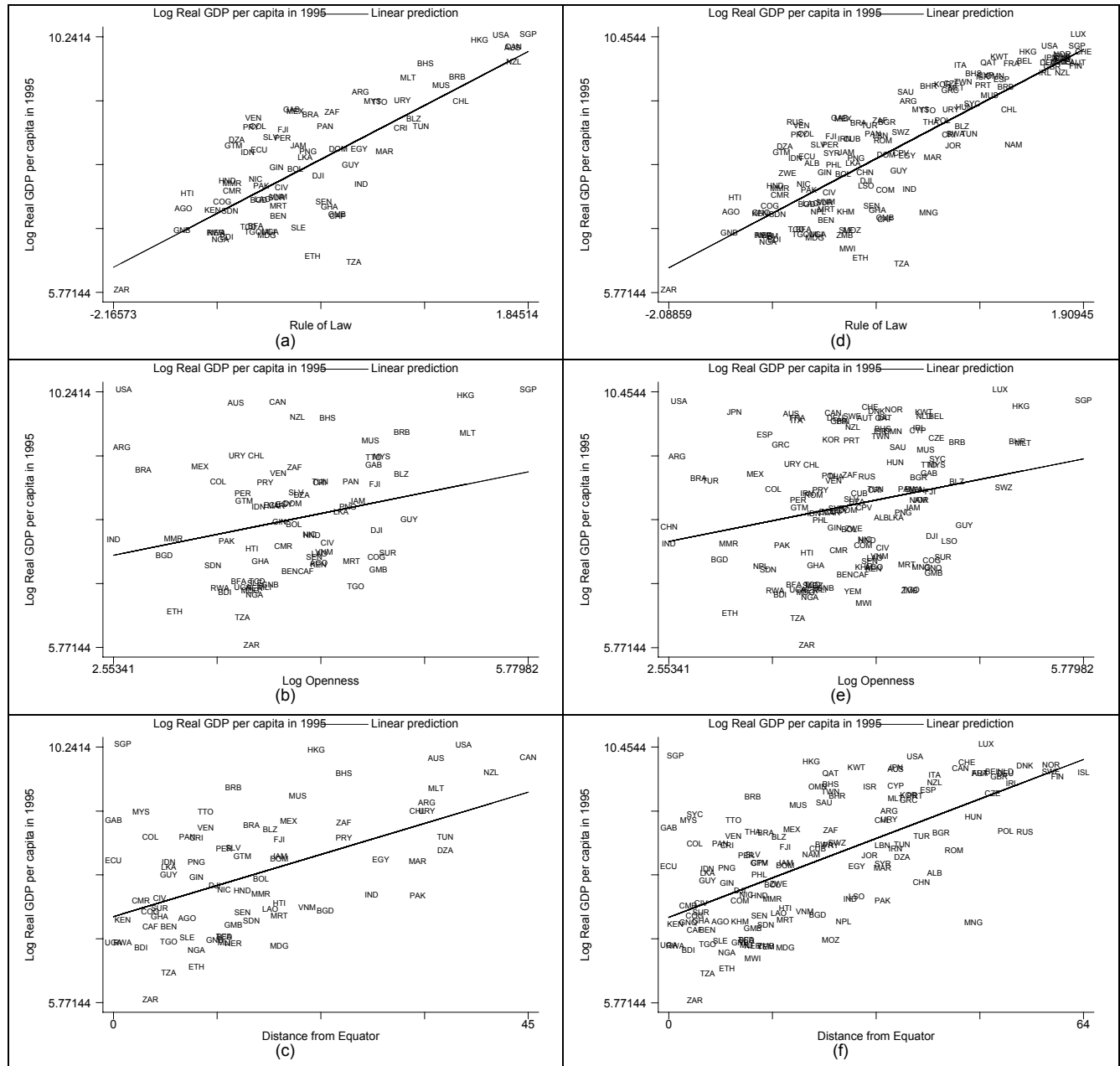
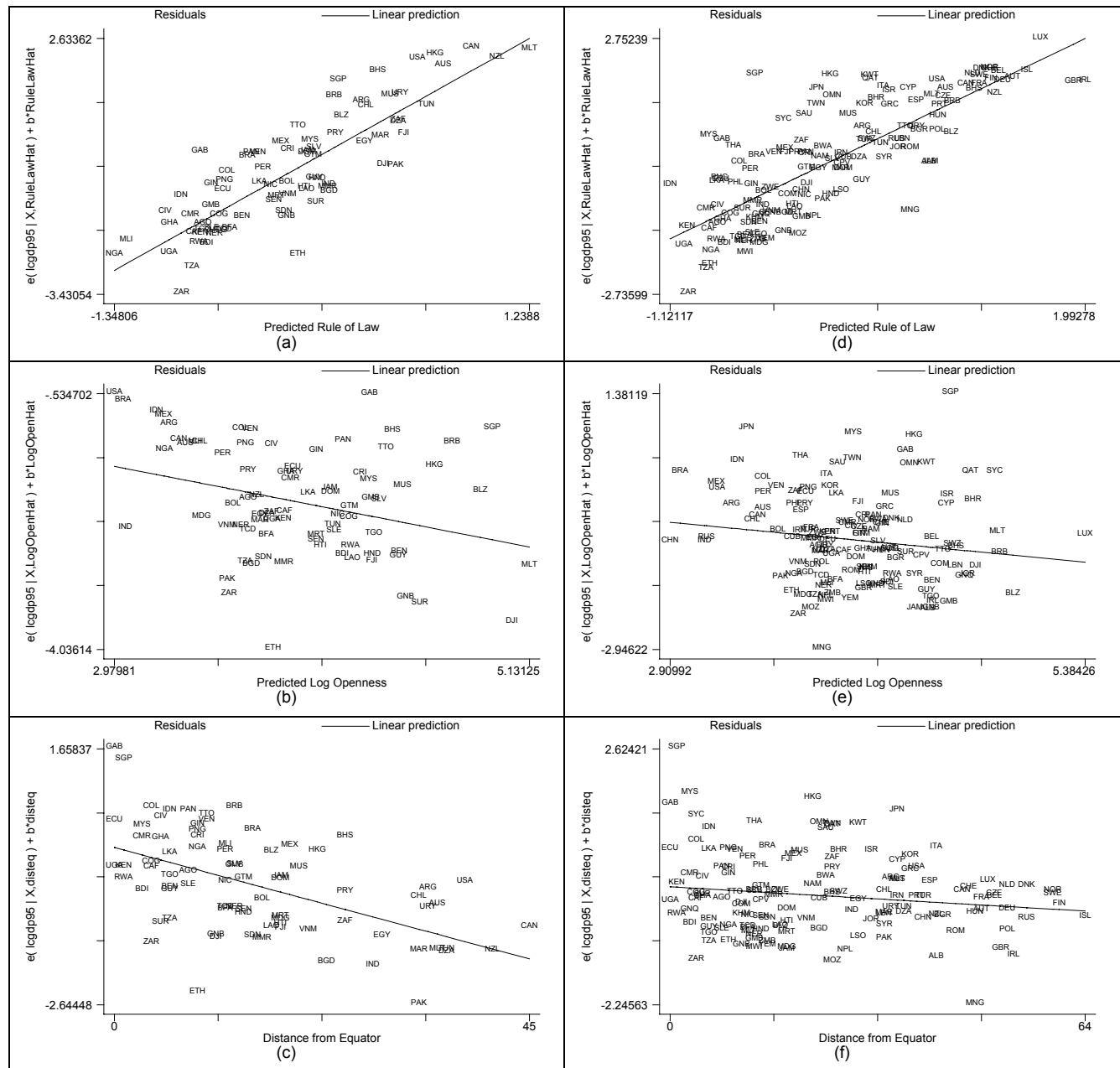


Figure 3: Conditional Correlations between Income and its Determinants.
(Sample of 80 countries for (a), (b), and (c); sample of 140 countries for (d), (e), and (f))



Note: The slopes of the linear prediction in (a), (b), and (c) above correspond to the (unstandardized) coefficients in column (6) of Table 2, while those in (d), (e), and (f) correspond to the (unstandardized) coefficients in column (9) of Table 2.

Figure 4: “Real Openness,” Openness, and Income
 (Difference between logs of “real openness” and openness on the vertical axis
 and log per capita PPP GDP on the horizontal axis)

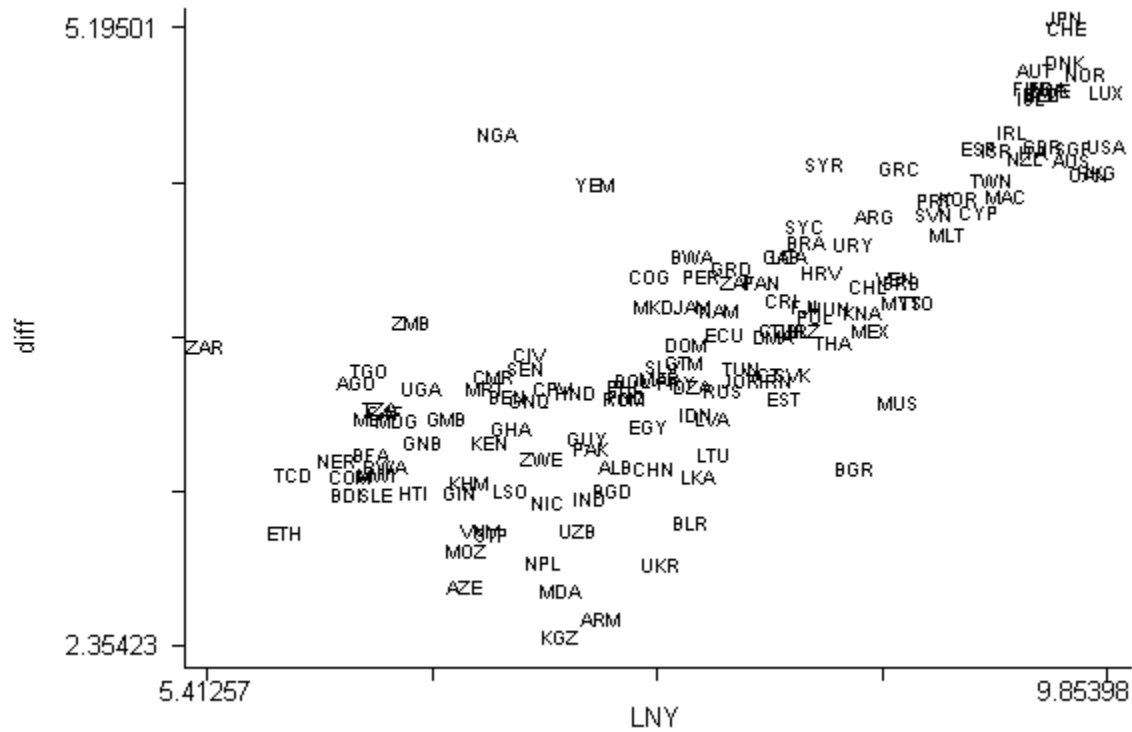


Figure 5: Distribution of incomes for colonized and non-colonized countries

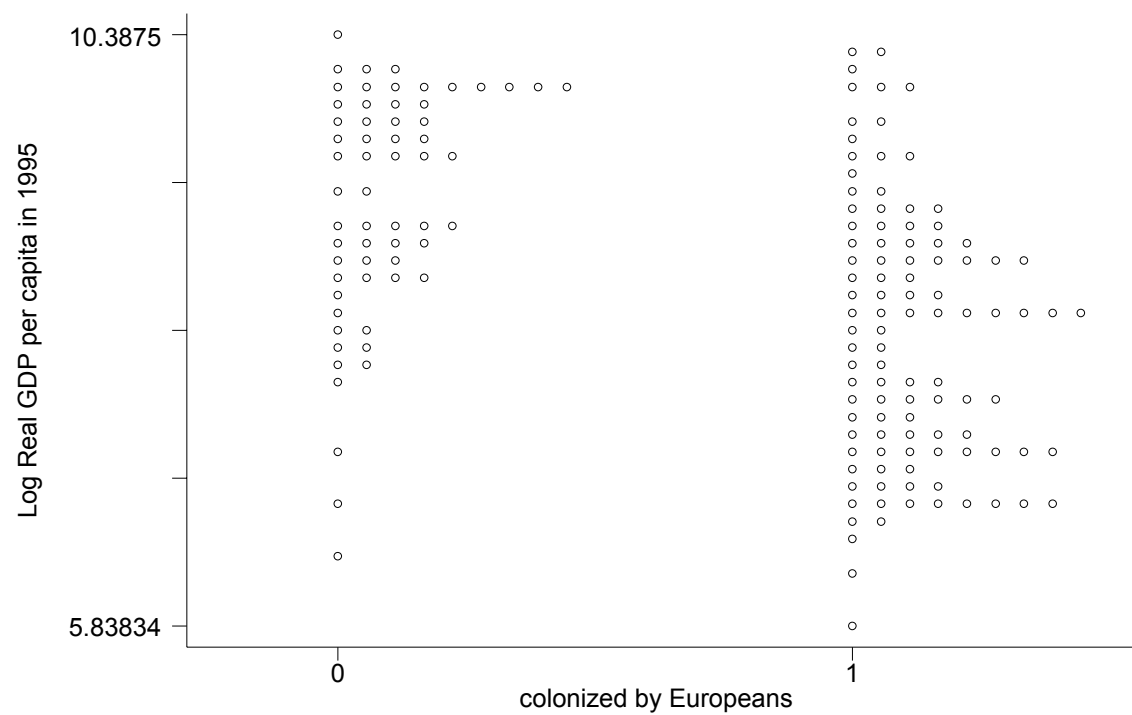


Table 1. Descriptive Statistics**Panel A: Mean and Standard Deviations of Key Variables**

	<i>Extended AJR Sample (80 countries)</i>	<i>Large Sample (140 countries)</i>
Log GDP per capita (PPP) in 1995 (LCGDP95)	8.01 1.05	8.40 1.14
Rule of law (RULE)	-0.25 0.85	0.89 0.94
Log openness (LCOPEN)	3.94 0.60	4.01 0.57
Distance from equator in degrees (DISTEQ)	15.23 11.16	23.60 16.29
Log European settler mortality (LOGEM4) (deaths per annum per 1000 population)	4.66 1.22	
Log constructed openness (LOGFRANKROM)	2.76 0.76	2.92 0.80
Fraction of population speaking other European language (EURFRAC)	0.30 0.41	0.24 0.39
Fraction of population speaking English (ENGFRAC)	0.11 0.29	0.08 0.24

Notes: Standard deviations are reported below the means. Rule of law ranges between -2.5 and +2.5. Openness is measured as the ratio of trade to GDP. Constructed openness—the instrument for openness—is the predicted trade share and is from Frankel and Romer (1999). Appendix B describes in detail all the data and their sources.

Panel B: Pairwise Correlations
(Sample of 80 countries)

	LCGDP95	RULE	LCOPEN	LOGFRANKROM	DISTEQ	LOGEM4	EURFRAC	ENGFRAC
LCGDP95	1							
RULE	0.763 0.000	1						
LCOPEN	0.260 0.020	0.263 0.018	1					
LOGFRANKROM	-0.043 0.703	0.026 0.821	0.734 0.000	1				
DISTEQ	0.513 0.000	0.520 0.000	-0.207 0.065	-0.292 0.009	1			
LOGEM4	-0.685 0.000	-0.540 0.000	-0.093 0.410	0.155 0.169	-0.491 0.000	1		
EURFRAC	0.612 0.000	0.438 0.000	-0.071 0.530	-0.128 0.258	0.276 0.013	-0.344 0.002	1	
ENGFRAC	0.491 0.000	0.544 0.000	0.153 0.175	0.018 0.876	0.303 0.006	-0.325 0.003	0.575 0.000	1

Notes: p-values reported below the coefficients. Variables described in Appendix B.

Table 2: Determinants of Development: Core Specifications

	AJR sample			Extended AJR sample			Large sample			Extended AJR sample	
Dependent variable	log GDP per capita 1995	log GDP per capita 1995	log GDP per capita 1995	log GDP per capita 1995	log GDP per capita 1995	log GDP per capita 1995	log GDP per capita 1995	log GDP per capita 1995	log GDP per capita 1995	RULE	LCOPEN
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Panel A. Ordinary least squares											
Geography (DISTEQ)	0.74 (4.48) *	0.20 (1.34)	0.32 (1.85) **	0.81 (5.35) *	0.25 (1.85) ***	0.36 (2.37) **	0.76 (10.59) *	0.21 (2.75) *	0.24 (2.9)	0.82 (5.71) *	-0.72 (-3.47) *
Institutions (RULE)		0.78 (7.56) *	0.69 (6.07) *		0.79 (8.96) *	0.70 (6.86) *		0.80 (12.41) *	0.77 (10.71) *		0.57 (4.14) *
Integration (LCOPEN)			0.16 (1.48)			0.15 (1.61)			0.08 (1.31)	0.34 (3.37) *	
Panel B. Two-stage least squares											
Geography (DISTEQ)	0.74 (4.48) *	-0.42 (-1.19)	-0.56 (-1.23)	0.81 (5.35) *	-0.44 (-1.22)	-0.70 (-1.34)	0.76 (10.59) *	-0.05 (-0.4)	-0.14 (-0.91)	0.78 (5.64) *	-0.86 (-3.09) *
Institutions (RULE)		1.67 (4.29) *	1.78 (3.78) *		1.76 (4.4) *	2.00 (3.55) *		1.19 (7.91) *	1.32 (6.77) *		0.77 (2.33) **
Integration (LCOPEN)			-0.18 (-1.23)			-0.302 (-1.07)			-0.17 (-1.35)	0.23 (2.04) **	
No. of observations	64	64	64	80	80	80	140	140	140	80	80
R-square	0.25	0.54	0.562	0.264	0.51	0.52	0.417	0.50	0.55	0.54	0.38
Test for over-identifying restrictions (p-value)							(0.0071)		(0.0365)		
Panel C: First Stage for Endogenous Variables (Institutions (RULE) and Integration (LCOPEN))											
Dependent variable	RULE			RULE			RULE			LCOPEN	RULE
Geography (DISTEQ)	0.41 (2.8) *	0.47 (3.21) *	-0.25 (-1.99) ***	0.46 (3.25) *	0.53 (3.76) *	-0.19 (-1.42)	0.65 (10.35) *	0.64 (10.92) *	-0.04 (-0.75)	0.01 (0.09)	0.46 (3.25) *
Settler mortality (LOGEM4)	-0.39 (-3.87) *	-0.40 (-4.1) *	-0.30 (-3.49) *	-0.34 (-3.63) *	-0.34 (-3.75) *	-0.27 (-3.2) *					-0.28 (-3.63) *
Population speaking English (ENGFRAC)							0.19 (2.69) *	0.18 (2.69) *	0.17 (2.66) *		
Population speaking other European languages (EURFRAC)							0.12 (1.74) ***	0.16 (2.43) **	-0.11 (-1.65)		
Constructed openness (LOGFRANKROM)			0.20 (1.95) **			0.19 (2.16) **		0.25 (4.37) *	0.70 (12.4) *	0.80 (9.10) *	
F-statistic	n.a.	22.9	17.2	n.a.	23.3	17.8	n.a.	46.3	44	42	23.3
R-square		0.41	0.44		0.36	0.39		0.49	0.55	0.54	0.36

Notes: The dependent variable in Panels A and B are per capita GDP in 1995, PPP basis. There are three samples for which the core regressions are run: (i) the first three columns correspond to the sample of 64 countries in Acemoglu, Johnson, and Robinson (2001; AJR); (ii) columns (4) to (6) use a sample of 80 countries for which data on settler mortality (LOGEM4) have been compiled by AJR; and (iii) columns (7) to (9) use a larger sample of 140 countries for which the instrument for institutions is that in Dollar and Kraay (2002; DK) but is also similar to that in Hall and Jones (1998). The regressors in Panels A and B are: (i) DISTEQ, the variable for geography, which is measured as the absolute value of latitude of a country; (ii) Rule of law (RULE), which is the measure for institutions; and (iii) LCOPEN, the variable for integration, which is measured as the ratio of nominal trade to nominal GDP. All regressors are scaled in the sense that they represent deviations from the mean divided by the standard deviation. The dependent variables in Panel C are measures of institutions (RULE) and/or integration (LCOPEN) depending on the specification. The regressors in Panel C are: (i) DISTEQ described above; (ii) settler mortality (LOGEM4) in the first six columns; (iii) the proportion of the population of a country that speaks English (ENGFRAC) and the proportion of the population that speaks any European language (EURFRAC) in the last three columns; (iv) instrument for openness (LOGFRANKROM) obtained from Frankel and Romer (1999). All regressors, except DISTEQ and RULE, in the three panels are in logs. See Appendix B for more detailed variable definitions and sources. Standard errors are corrected, using the procedure described in Frankel and Romer (1999), to take into account the fact that the openness instrument is estimated. T-statistics are reported under coefficient estimates. Significance at the 1 percent, 5 percent, and 10 percent levels are denoted respectively by “*”, “**”, and “***”.

Table 3. Determinants of Development: Channels of Influence

Dependent variable	<i>Extended AJR sample</i>				<i>Larger sample</i>			
	Income per worker	Capital per worker	Human capital per worker	Total factor productivity	Income per worker	Capital per worker	Human capital per worker	Total factor productivity
Geography (DISTEQ)	-0.94 (-1.47)	-1.68 (-1.59)	-0.25 (-1.5)	-0.32 (-0.97)	-0.26 (-1.15)	-0.39 (-1.11)	-0.05 (-0.91)	-0.14 (-0.89)
Institutions (RULE)	2.22 (3.29) *	3.41 (3.01) *	0.57 (3.14) *	1.06 (3.08) *	1.36 (5.01) *	1.95 (4.5) *	0.35 (5.21) *	0.72 (3.7) *
Integration (LCOPEN)	-0.41 (-1.31)	-0.68 (-1.26)	-0.15 (-1.84) ***	-0.13 (-0.79)	-0.36 (-2.27) **	-0.53 (-2.34) **	-0.12 (-3.19) *	-0.15 (-1.27)
R-square	0.60	0.52	0.52	0.45	0.58	0.54	0.59	0.35
No. of observations	74	74	74	74	122	122	122	122

Notes: The four dependent variables—income per worker, capital per worker, human capital per worker, and the level of total factor productivity—are expressed in natural logarithms and are from Hall and Jones (1999). IV estimates for the AJR sample use settler mortality (LOGEM4) as the instrument for institutions and EURFRAC and ENGFRAC as the instrument for the larger sample. All regressors, except RULE, are in logarithms and are scaled. Standard errors are corrected, using the procedure described in Frankel and Romer (1999), to take into account the fact that the openness instrument is estimated. T-statistics are reported under coefficient estimates. Significance at the 1 percent, 5 percent, and 10 percent levels are denoted respectively by “*”, “**”, and “***”.

Table 4. Determinants of Development: Robustness to "Influential" Observations, Neoeuropes, Legal Systems, Origin of Colonizer, and Religion

	Baseline 1	(1)*	(1)**	(1)***	(1)****	Baseline 2	(2)*	(2)**	(2)***	(3)	(4)	(5)
<i>Two-stage least squares: Dependent variable is log GDP per capita in 1995</i>												
Geography (DISTEQ)	-0.70 (-1.34)	-1.34 (-1.08)	-0.66 (-1.38)	-0.90 (-1.14)	-0.58 (-0.81)	-0.14 (-0.91)	-0.14 (-0.91)	0.02 (0.17)	-0.36 (-2.12) **	-0.96 (-1.45)	-0.67 (-0.98)	-0.81 (-1.27)
Institutions (RULE)	2.00 (3.55) *	2.68 (3.03) *	1.82 (3.31) *	2.82 (2.43) **	1.97 (1.67) ***	1.32 (6.77) *	1.32 (6.77) *	0.90 (8.47) *	1.69 (4.87) *	2.43 (3.09) *	2.22 (2.56) *	2.13 (2.97) *
Integration (LCOPEN)	-0.302 (-1.07)	-0.44 (-1.68)	-0.31 (-1.23)	-0.75 (-1.30)	-0.42 (-0.81)	-0.17 (-1.35)	-0.17 (-1.35)	0.03 (0.25)	-0.36 (-1.46)	-0.41 (-1.50)	-0.23 (-0.79)	-0.32 (-1.12)
REGIONAL DUMMIES												
Latin America (LAAM)			0.44 (1.25)		0.17 (0.33)			0.25 (1.655) ***				
Sub-Saharan Africa (SAFRICA)			-0.19 (-0.51)		-0.43 (-1.11)			-0.63 (-3.79) *				
East Asia (ASIAE)			0.24 (0.56)		0.07 (0.14)			0.12 (0.62)				
Legal origin										[0.133]		
Identity of colonizer											[0.058] ***	
Religion												[0.019] **
R-square	0.52	0.56	0.65	0.44	0.63	0.55	0.55	0.67	0.55	0.53	0.56	0.59
No. of observations	80	78	79	76	76	140	140	137	136	80	80	80
Omitted observations	None	Singapore Ethiopia	Ethiopia	Australia Canada New Zealand USA	Australia Canada New Zealand USA	None	None	Cuba Czech Rep. Germany	Australia Canada New Zealand USA	None	None	None

Notes: The dependent variable is per capita GDP in 1995, PPP basis. Baseline 1 corresponds to the specification in column (6) of Table 2. Baseline 2 corresponds to the specification in column (9) of Table 2. In columns labeled with 1 and 2 asterisks, influential observations are defined according to the Belsey, Kuh, and Welsch (1980) DFITS statistic, which requires omitting those observations for which DFITS exceeds $2(k/n)^{1/2}$, where k is the number of regressors and n is the sample size. In columns labeled with three or four asterisks, observations for Australia, Canada, New Zealand, and Canada (Neoeuropes) are omitted. Standard errors are corrected, using the procedure described in Frankel and Romer (1999), to take into account the fact that the openness instrument is estimated. T-statistics are reported under coefficient estimates. For legal origin, identity of colonizer, and religion, p-values for joint significance of the underlying variables (LEGFR and LEGSO for legal origin, COLUK and COLFR for colonizer's identity, and CATH, PROT, and MUSL for religion) are reported. Significance at the 1 percent, 5 percent, and 10 percent levels are denoted respectively by "****", "***", and "**". All regressors are scaled as described in the notes to Table 2.

Table 5. Determinants of Development: Robustness to Alternative Measures of Geography

<i>Two-stage least squares: Dependent variable is log GDP per capita in 1995</i>												
	Baseline	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Institutions (RULE)	2.00 (3.55) *	1.45 (3.01) *	2.03 (3.54) *	1.47 (6.08) *	1.48 (6.96) *	2.01 (3.34) *	1.94 (2.95) *	1.12 (3.80) *	1.84 (4.19) *	1.41 (5.95) *	1.43 (2.28) **	2.27 (2.04) **
Integration (LCOPEN)	-0.30 (-1.07)	-0.18 (-0.89)	-0.35 (-0.99)	-0.10 (-0.51)	0.00 (0.01)	-0.43 (-1.10)	0.01 (0.04)	-0.01 (-0.11)	-0.25 (-0.65)	-0.09 (-0.46)	-0.23 (-0.70)	-0.61 (-0.96)
Geography (DISTEQ)	-0.70 (-1.34)	-0.38 (-0.94)									-0.48 (-1.53)	-0.75 (-1.47)
REGIONAL DUMMIES												
Latin America (LAAM)		0.44 (1.63)										
Sub-Saharan Africa (SAFRICA)		-0.33 (-1.03)										
East Asia (ASIAE)		0.30 (0.87)										
Area under tropics (TROPICS)			0.65 (1.46)									0.35 (0.79)
Access to sea (ACCESS)				-0.06 (-0.19)								
Major oil exporter (OIL)					0.24 (2.17) **							
Days under frost (FROSTDAYS)						-1.11 (-1.48)					-0.26 (-0.53)	-0.79 (-0.92)
Area under frost (FROSTAREA)							-0.65 (-1.17)					
Malaria (MALFAL94)								-0.24 (-1.49)			-0.32 (-1.73) ***	-0.14 (-0.48)
Temperature (MEANTEMP)									0.53 (1.29)			-0.26 (-0.53)
R-square	0.52	0.63	0.54	0.53	0.54	0.53	0.51	0.66	0.65		0.70	0.73
No. of observations	80	80	77	77	68	77	67	72	70	72	72	68

Notes: The dependent variable is per capita GDP in 1995, PPP basis. Baseline corresponds to the specification in column (6) of Table 2. Standard errors are corrected, using the procedure described in Frankel and Romer (1999), to take into account the fact that the openness instrument is estimated. t-statistics are reported under coefficient estimates. Significance at the 1 percent, 5 percent, and 10 percent levels are denoted respectively by “*”, “**”, and “***”.

Table 6. Determinants of Development: Robustness to Alternative Measures of and Instruments for Integration

<i>Two-stage least squares: Dependent variable is log GDP per capita in 1995</i>								
	Baseline	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Geography (DISTEQ))	-0.70 (-1.34)	-0.49 (-0.71)	-0.58 (-0.79)	0.08 (0.28)	0.07 (0.25)	-1.11 (-1.24)	-1.19 (-1.14)	-0.85 (-1.15)
Institutions (RULE)	2.00 (3.55) *	1.79 (2.51) **	1.88 (2.51) **	1.06 (3.07) *	1.07 (3.17) *	2.68 (2.16) **	2.81 (1.87) ***	2.59 (2.10) **
Integration (LCOPEN)	-0.30 (-1.07)	0.20 (0.17)	0.04 (0.04)	-0.71 (-0.92)	-0.70 (-1.00)			
Land area (AREA)		0.25 (0.68)	0.21 (0.56)	-0.32 (-1.00)	-0.32 (-1.05)			
Population (POP)		0.21 (0.29)	0.13 (0.17)	-0.29 (-0.53)	-0.28 (-0.56)			
"Real openness" (LNOPEN)						-0.74 (-0.81)	-0.89 (-0.70)	
"Policy openness" (SW)								-2.09 (-1.06)
R-square	0.52	0.61	0.62	0.59	0.59	0.56	0.55	0.61
No. of observations	80	80	80	139	139	72	72	70

Notes: The dependent variable is per capita GDP in 1995, PPP basis. All regressors, except DISTEQ, RULE, and SW, are expressed in logs. Baseline corresponds to the specification in column (6) of Table 2. In columns (1), (3) and (5) the instrument for openness (LOGFRANKROM) is from Frankel and Romer (1999). In columns (2), (4) and (6), the instrument for openness (LOGFRANKROMR) is derived by re-estimating the gravity equation in Frankel and Romer (1999) with the left-hand side variable defined as nominal bilateral trade to nominal GDP. In FR, the left hand side variable was defined as nominal trade divided by PPP GDP. Standard errors are corrected, using the procedure described in Frankel and Romer (1999), to take into account the fact that the openness instrument is estimated. t-statistics are reported under coefficient estimates. Significance at the 1 percent, 5 percent, and 10 percent levels are denoted respectively by "*", "**", and "***". All regressors are scaled as described in the notes to Table 2.

Table 7. Robustness of the Dollar-Kray Results

Panel A. Two-stage least squares: dependent variable is log GDP per capita in 1995

	(1)	(1)*	(1)**	(1)***	(1)****	(2)	(2)*	(2)**	(3)	(3)*	(3)**
Institutions (RULE)	2.14 (0.77)	1.73 (4.71) *	1.52 (7.92) *	1.56 (7.41) *	1.64 (6.16) *	1.26 (3.6) *	1.54 (4.32)	1.38 (11.65) *	3.52 (1.18)	2.83 (2.2) **	1.56 (8.31) *
"Real openness" (LNOPEN)	-1.37 (-0.23)	-0.53 (-0.85)				0.18 (0.3)	-0.36 (-0.84)		-3.40 (-0.71)	-1.81 (-1.26)	
Integration (LCOPEN)			-0.21 (-0.44)	-0.27 (-0.65)	-0.45 (-0.9)			-0.32 (-0.91)			-0.83 (-1.5)
Population (POP)	-0.25 (-0.16)		0.04 (0.3)	0.00 (0.02)	-0.05 (-0.4)	0.13 (1.08)		-0.01 (-0.05)	-0.53 (-0.56)		-0.08 (-0.59)
No. of observations	63	63	63	68	78	134	134	151	130	130	130

Panel B. Two-stage least squares: Dependent variable is decadal average real per capita GDP growth

	(1)	(1)*	(2)	(2)*	(3)	(3)*	(4)	(4)*	(5)	(5)*
Average real per capita GDP growth in previous decade	0.64 (0.88)	1.84 (0.34)	0.89 (2.34) *	0.40 (0.83)	0.97 (2.58) *	1.37 (0.76)	3.31 (0.21)	-0.52 (-0.51)	0.73 (3.15) *	0.43 (1.14)
Changes over previous decade in average:										
Log real openness	0.23 (2.2) *	0.52 (0.35)	0.29 (2.69) *	0.13 (0.84)	0.38 (3.14) *	0.64 (0.77)	0.16 (0.12)	-0.13 (-0.23)	0.21 (2.15) **	0.11 (0.82)
Institutions										
Contract-intensive money (CIM)	-0.17 (-0.12)	1.52 (-0.23)								
Revolutions			0.18 (0.8)	0.13 (0.7)						
Freedom house rating (FREEDOM)					0.00 (0.002)	0.00 (0.03)				
Rule of law (ICRG)							0.56 (0.2)	-0.73 (-0.55)		
War deaths									25.20 (0.54)	19.83 (0.57)
1980s dummy		-0.16 (-1.42)		-0.01 (-2.92) *		-0.02 (-0.7)				-0.11 (-3.09) *
1990s dummy		0.02 (0.2)		0.00 (0.47)						0.00 (0.5)
1980s Asia dummy		0.00 (0.01)		0.14 (1.78) ***		0.00 (0.16)				0.01 (1.89) ***
1980s Africa dummy		-0.02 (-0.15)		-0.02 (-2.26) **		0.00 (0.08)				-0.02 (-1.66) ***
1980s Latin America dummy		-0.01 (-0.11)		-0.02 (-3.25) *		-0.01 (-0.58)				-0.02 (-3.32) *
1990s Asia dummy		-0.02 (-0.24)		0.00 (0.3)		-0.01 (-0.39)		0.03 (0.97)		0.01 (0.79)
1990s Africa dummy		0.03 (0.2)		-0.01 (-0.84)		0.02 (0.39)		-0.04 (-0.98)		-0.01 (-0.76)
1990s Latin America dummy		0.01 (0.26)		0.00 (0.07)		0.01 (0.54)		-0.02 (-0.87)		0.00 (0.41)
No. of observations	193	193	243	243	189	189	79	79	264	264
Decades	70s, 80s and 90s	70s, 80s and 90s	70s, 80s and 90s	70s, 80s and 90s	80s, 90s	80s, 90s	90s	90s	70s, 80s and 90s	70s, 80s and 90s

Notes: Panel A relates to the level regressions in Table 1 and Panel B to the decadal growth regressions in Table 4 of DK. All variables are as defined in that paper. In Panel A, equations (1), (2), and (3) without asterisks reproduce, respectively, equations (12), (7), and (6) in Table 1. Equations with asterisks represent variations on the equations without asterisks. All regressors, except RULE, are in logarithms and are not scaled as in Tables (2)-(5) to facilitate comparison with the original equations. In Panel B, equations (1) –(5) without asterisks correspond respectively to equations (4), (6), (8), (10), and (12) in Table 4 of DK. Equations with asterisks add time and region dummies to the un-asterisked equation. T-statistics are reported under coefficient estimates. Significance at the 1 percent, 5 percent, and 10 percent levels are denoted respectively by “*”, “**”, and “***”.

Appendix A: The Inappropriateness of “Real Openness”

Technology and trade. Imagine a symmetric world populated with a large number of small endowment economies. Each economy i has a fixed endowment of nontraded and traded goods, denoted by N_i and T_i respectively. Let each country produce a different traded good (the Armington assumption), but consume all the varieties of traded goods produced around the world. If there is a very large number of countries, each country’s consumption of its own endowment of the traded good will be negligible: (almost) all of its traded good will be exported in exchange for imports of the traded goods produced elsewhere. Let PN_i stand for the price of nontraded goods in country i and let the prices of all traded goods be fixed at unity. Since the sum of exports and imports are given by $2T_i$, conventionally measured openness in a country i can then be expressed as $ON_i = 2T_i/(PN_i*N_i + T_i)$.

Preferences. Assume that preferences in each country take the Cobb-Douglas form, such that nontraded goods and traded goods (in aggregate) have fixed budget shares. Under this assumption, $2T_i/(PN_i*N_i + T_i)$ will be constant and independent of a country’s endowments of T and N . (This is because $dPN_i/PN_i = dT_i/T_i - dN_i/N_i$.) Cross-country differences in conventionally measured openness, ON_i , will arise solely from differences in Cobb-Douglas budget shares.

Cross-national income differences. Now assume that differences in the endowment of the traded good are the only source of cross-country differences in income. That is, all countries have identical N_i but varying T_i . Countries with larger T_i are richer.

Cross-sectional relationship between openness and income. Under the above assumptions, there is no causal relationship that goes from trade to incomes. Cross-country differences in income are due entirely to differences in endowments. And if we run a regression of income on openness, we will get nothing. Trade shares either do not vary across countries, or they vary “randomly” with the Cobb-Douglas parameter. They have no systematic relationship to levels of income. So the econometrics will provide a good guide to the underlying reality.

The AC adjustment. Now suppose that we follow AC, and construct their real openness measure, OR_i . This adjustment consists of expressing the value of i ’s nontraded production at some benchmark country’s prices, PB , instead of domestic prices, PN_i . The AC measure of real openness is therefore $OR_i = 2T_i/(PB*N_i + T_i)$. Note that OR_i is increasing in T_i . When we correlate OR_i with incomes across countries, we will get a positive relationship. This is a spurious relationship, since the only source of productivity differences in this model is differences in endowments.

Remarks. In this benchmark model, the conventional measure of openness does exactly what we would like a measure of openness to do under the null hypothesis that trade does not cause productivity. The AC variant, meanwhile, imparts a positive bias to the estimated trade-income relationship. A key feature of the model above is that the elasticity of substitution in demand between T and N is unity. This ensures that the rise in PN is just enough to keep (conventional) openness invariant to changes in the endowment (or

productivity) of tradables. When the elasticity of substitution differs from one, conventional openness does not always deliver such a helpful result, but the bias is not unidirectional. So with an elasticity of substitution greater than one, a regression of income on conventional openness will yield (misleadingly) a positive coefficient, while with an elasticity less than one, the regression will yield (misleadingly) a negative coefficient. However, the AC real openness measure is invariant to the elasticity of substitution and hence is always positively biased.

Appendix B: Data and Sources

AFRICA = Dummy variable taking value 1 if a country belongs to Africa, 0 otherwise.

ASIA = Dummy variable taking value 1 if a country belongs to Asia, 0 otherwise.

ACCESS = Dummy variable taking value 1 for countries without access to the sea, 0 otherwise.

AREA = Land area (thousands sq. mt.) Source: Frankel and Romer (1999).

ASIAE = Dummy variable taking value 1 if a country belongs to South-East Asia, 0 otherwise.

CATH = Dummy variable taking value 1 if the country's population is predominantly catholic.

CIM = Contract Intensive Money. Source: World Bank (2002).

COLFR = Dummy variable taking value 1 if the colonizer was France.

COLUK = Dummy variable taking value 1 if the colonizer was England.

DISTEQ = Distance from Equator of capital city measured as $\text{abs}(\text{Latitude})/90$. Source: World Bank (2002).²⁰

ENGFRAC = Fraction of the population speaking English. Source: Hall and Jones (1999).

EURFRAC = Fraction of the population speaking one of the major languages of Western Europe: English, French, German, Portuguese, or Spanish. Source: Hall and Jones (1999).

FREEDOM = Political rights index. Freedom House, various issues.

FROSTAREA = Proportion of land with >5 frost-days per month in winter. Source: Masters and McMillan (2001).

FROSTDAYS = Average number of frost-days per month in winter. Source: CID Harvard University (2002) from Masters and McMillan (2001).

²⁰ Note: World Bank (2002) refers to the data set used in Dollar and Kraay (2002), which was kindly provided by Aart Kraay.

ICRG = Rule of law index. Source: International Country Risk Guide, various issues.

LAAM = Dummy variable taking value 1 if a country belongs to Latin America or the Caribbean, 0 otherwise.

LCGDP95 = Natural logarithm of per capita GDP in Purchasing-Power-Parity US dollars (PPP GDP) in 1995. Source: Penn World Tables, Mark 6.

LCOPEN = Natural logarithm of openness. Openness is given by the ratio of (nominal) imports plus exports to GDP (in nominal US dollars). Source: Penn World Tables, Mark 6. Average over all 1950-98 available data.

LFR = Dummy variable taking a value of 1 if a country has a legal system deriving from that in France.

LNOPEN = Natural logarithm of “real” openness. Real openness is given by the ratio of nominal imports plus exports to GDP in Purchasing-Power-Parity US dollars (PPP GDP). Source: Penn World Tables, Mark 5.6 and World Bank (2002).

LOGA = Labor-augmenting technological progress parameter in 1998. Source: Hall and Jones (1998)

LOGEM4 = Natural logarithm of estimated European settlers’ mortality rate. Source: Acemoglu, Johnson, and Robinson (2001)

LOGFRANKROM = Natural logarithm of predicted trade shares computed following Frankel and Romer (1999) from a bilateral trade equation with “pure geography” variables. Source: Frankel and Romer (1999).

LOGFRANKROMR = Natural logarithm of predicted trade shares computed as for LOGFRANKROM except that the dependent variable in the bilateral trade (gravity) equation is nominal trade divided by nominal GDP (both in US dollars). Source: Authors’ estimates.

LOGHL = Natural logarithm of human capital per worker in 1988. Source: Hall and Jones (1998).

LOGKL = Natural logarithm of physical capital per worker in 1988. Source: Hall and Jones (1998).

LOGYL = Natural logarithm of GDP in Purchasing-Power-Parity US dollars (PPP GDP) per worker in 1988. Source: Hall and Jones (1998).

LSO = Dummy variable taking a value of 1 if a country has a socialist legal system.

MALFAL94 = Malaria index, year 1994. Source: Gallup and Sachs (1998).

MEANTEMP = Average temperature (Celsius). Source: CID Harvard University (2002).

MUSL = Dummy variable taking value 1 if the country's population is predominantly muslim.

OIL = Dummy variable taking value 1 for a country being major oil exporter, 0 otherwise.

POP = Population. Source: World Bank (2002).

PROT = Dummy variable taking value 1 if the country's population is predominantly protestant.

REVOLUTIONS = Number of revolutions per year. Source: World Bank (2002)

RULE = Rule of Law index. Refers to 2001 and approximates for 1990's institutions Source: Kaufmann, Kraay, and Zoido-Lobaton (2002)

SAFRICA = Dummy variable taking value 1 if a country belongs to Sub-Saharan Africa, 0 otherwise.

SW = Dummy variable taking value 0 if the country had BMP = 1, MON = 1, SOC = 1, TAR > 0.4, or NTB > 0.4; 1 otherwise. Source: Sachs and Warner (1995)

TROPICS = Percentage of tropical land area. Source: Gallup and Sachs (1998).

WARDEATHS = Fraction of population killed in wars. Source: World Bank (2002)

XCONST1970 = Constraint on the executive in the 1970s. Source: Polity IV dataset.

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