The world's economies are environmentally destructive. Economic distortions or increases in productive efficiency, the effects of increased growth on the environment are likely to be positive.

**Fast-growing economies with liberal trade policies have experienced less pollution-intensive growth than closed economies**

- Pollution intensity per capita appears to fall as income rises, but evidence of the relationship presented at the conference was based on industrial toxic emissions data, which reflect changes in economic structure (compositional effects) and not the toxic intensity of manufacturing output. Toxic emissions continue to rise worldwide.
- Fast-growing economies with liberal trade policies (such as Chile) have experienced less pollution-intensive growth than closed economies (such as Bolivia and El Salvador). Again, this is a compositional effect. But the contrast between open and closed economies may be even more pronounced if the relative toxic intensities within industry were taken into account.
- There is some evidence from the United States that when interest groups link demands for protection from import competition to environmental arguments, they enjoy a higher success rate in securing trade restrictions. The economic consequences of this kind of strategy are generally unfavorable—and the environmental effects are at best uncertain. One example is a proposed amendment to the Clean Air Act that would have banned imports of electricity from Canadian power plants that did not meet new U.S. environmental standards (and that would have protected U.S. plants subject to less stringent rules).
- Pollution abatement and control expenditures by firms do not appear to have had a significant effect on competitiveness in most industries, since these expenditures represent a modest share of total costs. This suggests that national differences in environmental
Daniel Westbrook and James Tybout on estimating returns to scale with large, imperfect panels: An application to Chilean manufacturing industries


Policymaking in the Open Economy: Concepts and Case Studies in Economic Performance

New Research

Gender-specific and age cohort-specific education stock for developing countries

Subnational finance in transition economies: Broadening the framework for analysis

Abandonment of the fixed exchange rate regime in Latin America

Labor markets and employment issues: Kenya and Côte d’Ivoire

Financial integration and development in Sub-Saharan Africa

Economic shocks and the global environment

Exchange rate commitments and central bank independence

Household responses to seasonal income fluctuations in rural India

Shantayanan Devarajan, Jeffrey Lewis, and Sherman Robinson on external shocks, purchasing power parity, and the equilibrium real exchange rate

Rudiger Dornbusch and Stanley Fischer on moderate inflation

Kala Krishna on theoretical implications of imperfect competition on quota license prices and auctions

Brian Levy on obstacles to developing indigenous small and medium enterprises: An empirical assessment

The World Bank Policy Research Bulletin is published five times a year by the Research Advisory Staff. Subscriptions to the Bulletin are complimentary and may be ordered by contacting Evelyn Alfaro at the Bank’s main address, room S3-127. The Bulletin’s purpose is to inform the development community of the Bank’s policy and research output. It includes descriptions of Bank publications, research summaries, and updates of events in and outside the Bank. The views and interpretations in articles published are those of the authors and do not necessarily represent the views and policies of the World Bank or of its Executive Directors or the countries they represent. The Bulletin is not copyrighted, and it may be reproduced with the appropriate source attribution. For more information, contact Evelyn Alfaro, the production manager. Alison Strong is the editor.
Continued from page 1

regulations have not been a major explanatory factor in the changing international location patterns of dirty industries. Moreover, rising costs of compliance with environmental standards tend to affect most countries.

Dirty industries have expanded faster in developing countries than the average rate for all industries over the past two decades—and faster than in industrial countries. It is uncertain, however, whether this international pattern merely reflects growth—or industrial migration as well.

- It seems that firms have good reason not to transfer dirtier technologies to lower-income countries when they invest in these countries. Evidence from the wood pulp industry shows that the rate of clean technology adoption and diffusion is higher in open economies than in closed ones.

Trade policy and environmental objectives

A key issue in environmental economics is how best to protect the environment. Through command-and-control interventions, such as trade restrictions and the use of pollution abatement funds? Or through market-based solutions, such as industrial recycling and the diffusion of clean technology?

The tradition of direct control has dominated environmental policy in industrial countries. Governments prefer direct command-and-control measures for several reasons, according to Patrick Low and Raed Safadi. Regulation generally ensures more predictable outcomes. It assures the public of the government’s commitment to environmental quality. And it provides public authorities with discretionary authority over polluters. For these reasons, the shift to more economically efficient market interventions is likely to be gradual, even in countries with the highest environmental standards. (Such market-based policy alternatives have been regarded as an option only quite recently.)

In comparing environmental and trade regulations across countries, most economists assume that the capacities to absorb emissions and other concentrations of pollutants vary and that social priorities differ. Differences in absorptive capacities give rise to a different structure of costs and benefits from pollution abatement and control activities—and probably influence optimal resource depletion rates. Different social priorities (or discount rates) simply reflect the fact that not all societies embrace identical environmental objectives.

**Direct control has dominated environmental policy in industrial countries**

These two propositions may seem obvious and unexceptionable to economists, who think in terms of scarcity, choice, and opportunity cost. But they are not so obvious to those who are tempted to assign an infinite value to the environment.

Differences in absorptive capacities and social preferences allow the environment to be treated as an endowment—or as a factor of production that is part of a country’s comparative advantage. According to Low and Safadi, it follows that environmental standards and pollution abatement and control activities will differ across countries, and there is no valid presumption in favor of uniformity or harmonization.

**Harmonization?**

Wide support exists in the environmental community for unified action on the environment by all countries. The harmonization of environmental standards would permit direct control of environmental policy internationally, and as Nemat Shafik puts it, “Harmony in environmental standards allows the imposition of external preferences without the disharmony of gunboat diplomacy.” As already noted, differing absorptive capacities and social discount rates argue against uniformity as an international environmental policy goal.

In considering such a goal, a distinction must be made between product standards and process standards. Product standards (relating to externalities in consumption) need to be enforced in the consuming jurisdiction irrespective of the source of the product. This means that harmonization occurs, at least for goods from all sources in a given market, although not necessarily for those goods in all markets. Process standards (externalities in production), however, should generally be specific to the location of production.

While calls for the harmonization of process standards are sometimes seen by economists as intrinsically protectionist, environmentalists disagree. Stewart Hudson asserts that such standards are increasingly important, since they account for the life cycle of a product, beginning with the extraction of natural resources and including the environmental ramifications of transport, marketing, packaging, consumption, and disposal.

In sum, differences in environmental policy—whether in standards or in enforcement capacities—may not significantly affect a
country's advantage over a competing trade partner. However, more research is required. Even if the cost advantages from these national differences are significant, this is no clear case for equalizing costs—or for the harmonization of standards.

**Growth, trade, and environmental quality**

An important question, clearly in need of research, relates to the more dynamic aspects of the relationship between growth and trade liberalization on the one hand—and environmental quality on the other.

Discussing the links between growth and the environment in general terms, Marian Radetzki argues that increasing levels of economic activity are linked to improved environmental conditions. Explaining this relationship, he identifies as key factors the high income elasticity of demand for environmental quality, compositional shifts toward cleaner environmental activities at higher income levels, and the extension of property rights combined with the development of policies to deal with common global externalities in industrial countries.

From a policy perspective, evidence that the pollution intensity/growth relationship goes the right way argues strongly against the adoption of antigrowth policies. Policies that factor in environmental externalities may well raise costs and reduce output—clearly preferable to an uncritical pursuit of growth at any price. But adopting such an approach should be a matter of adjusting relative prices to reflect social costs and benefits, not of inveighing against increased economic activity because it carries environmental costs and consumes scarce resources. And once environmental policy interventions are contemplated, making the choice between more and less efficient alternatives becomes important from a welfare perspective, particularly when absolute pollution continues to rise and environmental crises occur.

Ramon Lopez is less sanguine than many other economists about the extent to which technical progress can mitigate the environmental costs of increasing economic activity, including that from trade liberalization. He presents a formal model that distinguishes between growth with feedback effects (where pollution or resource depletion affects future production) and growth based simply on factor expansion (where today's polluting activities do not affect tomorrow's output). In the first case, there is an incentive to invest in the resource stock to protect its future value—and so resource degradation or pollution may decrease with growth, particularly if appropriate ownership incentives are present. Where growth results simply from factor expansion with no allowance for technological change, the only way pollution can be reduced is through a reduction in output.

**Increasing levels of economic activity are linked to improved environmental conditions**

Increasing levels of economic activity are linked to improved environmental conditions, particularly when absolute pollution continues to rise and environmental crises occur.

**Restricting trade won't save trees**

Ironically, the use of export restrictions damaged Indonesian wet tropical forests more than a resource management program involving a tax on all timber at the logging stage would have. The welfare costs and benefits of export restrictions have to be calculated from a broader perspective than merely that of the degree to which the forest was compromised. But certainly from an environmental perspective, the discrimination in favor of local wood processors resulting from export restrictions led to a more intensive use of logs by relatively inefficient local industries. If wood processors from industrial countries were to stop hiking tariffs, they would promote more efficient, less environmentally degrading use of tropical wood. Sometimes, trade policy makes bad environmental policy. An import prohibition by industrial countries on tropical hardwoods would have to be applied by all the big players in the hardwood market to be effective. Such cooperation would prove very difficult to achieve. But even if it were achieved, its environmental effects could be negative. An import ban would depress the price of the product, thereby assigning a lower value to forests, and encouraging lax management of the resource and conversion of forest land to other uses.

From Carlos Primo Braga, "Tropical Forests and Trade Policy: The Case of Indonesia and Brazil."
compositional effect. There is no evidence that industry has left industrial countries. Neither is it apparent whether industries have chosen to locate in developing countries, rather than industrial countries, because of more lenient environmental regulation.

Patrick Low and Alexander Yeats use trade flow data as a proxy for shifts in the pattern of international industrial location to examine how much dirty industries have migrated to developing countries over the past two decades. They identify 43 dirty industries based on the assumption that the higher the expenditures on pollution abatement and control, the dirtier an industry. Trade data show that the share of dirty industry trade in total trade declined between 1965 and 1988, largely as a result of trends in industrial countries. Over the same period, the share of the output of dirty industries in the exports of many developing countries increased.

Low and Yeats supplemented that analysis with an examination of the revealed comparative advantage (RCA) of 109 countries in the dirty industries. The RCA index measures whether the share of a product in a country’s manufactured exports is proportionately larger than the share of that product in world trade in manufactures. If it is, the country is said to have a revealed comparative advantage in that product. Applying this index to dirty industries showed a disproportionately large increase in the number of developing countries with RCAs in most of the polluting industries. The rate at which developing countries acquired RCAs in dirty industries in the period under study was four times greater than that of industrial countries and faster than the developing country average for all industries.

The faster growth of dirty industries in lower-income countries may relate to such considerations as relative labor costs or natural resource endowments. Another possible explanation is that particular kinds of industries, which happen to be relatively dirty, predominate in early stages of industrial development.

Dirtier industries tend to be located in less open economies in Latin America

An issue in need of further research is whether firms that locate in low-income countries are dirtier than they would be if they located in industrial countries. Firms may wish to eschew this strategy even if it appeared that differences in environmental regulation offered a competitive advantage. Reasons include fear of liability in the event of an environmental accident, the risk to a firm’s reputation from an environmental scandal, the demands of consumers (“green consumerism”) in export markets, anticipation of more stringent local environmental standards, and the relatively high costs of retrofitting aging capital equipment rather than starting out with top-of-the-line technology. Another is the cost of unbundling technology, such as the expense of shifting from “cleaner” production processes to older, “dirtier” ones.

Nancy Birdsall and David Wheeler show that dirtier industries tend to be located in less open economies in Latin America. If economies with open trade regimes attract more foreign investment than closed ones, these technological factors are likely to be at work to a greater degree in the open economies. So, there may be an even stronger case from an environmental perspective for promoting liberal trading arrangements in developing countries than suggested by the industry composition data alone. Birdsall and Wheeler present some anecdotal evidence from Chile of the positive link between openness and the transfer of environmentally clean technology.

What went wrong in Eastern Europe

The past decade has revealed the profound neglect of the environment in Eastern Europe. For example, in 1986, no more than 4.6 percent of all river water in Poland was potable on the basis of chemical analysis, and 39.4 percent of the water was so polluted that it could not even be employed for industrial uses. Sweden and Finland, which possess some three quarters of the Baltic coastline, together accounted for 11 percent of the phosphorus discharges and 17 percent of the nitrogen discharges into the Baltic Sea in 1988. The share of Poland and the former Soviet Union was 72 percent for each of the two materials. In 1988, Czechoslovakia, East Germany, and Poland each recorded nitrogen oxide emissions per dollar of GDP that were at least twice the levels in France, Italy, or West Germany; their sulfur dioxide emissions were more than 10 times higher than in the three Western European nations.

The environmental degradation of Eastern Europe is primarily explained by the political suppression of consumer choice. The political elite focused on growth in physical output, without much regard for the quality of that output or for the ensuing environmental impact. Voters and consumers were given no opportunity to voice concerns about the pollution. The environmental debate in Eastern Europe did not arise in earnest until after the communist political monopoly had crumbled.

From Marian Radvanski, “Economic Growth and Environment.”
International cooperation and the environment

Looking at various aspects of international cooperation, Low and Safadi argue that trying to coerce countries into adopting particular environmental policies on the basis of unilateral objectives is unlikely to raise environmental quality. Where punitive trade restrictions are involved, the costs of inefficiency associated with inappropriate interventions must also be considered. Environmental targets are more likely to be attained through cooperative arrangements that involve incentives than through those that involve threats.

Analyzing alternative policy approaches to dealing with international environmental externalities, Ishac Diwan and Nemat Shafik demonstrate how, in a situation of less than perfectly functioning markets for capital and emissions, the opening of one market and not the other may lead to a harmful environmental outcome. This is an application of the theory of the second best.

Diwan and Shafik also establish the case for compensation, especially where industrial and developing country environmental priorities differ, and where developing countries are expected to respond to industrial country concerns. While industrial countries worry about such issues as climate change and biodiversity, developing countries are much more preoccupied with domestic problems such as health and local pollution.

Making a careful analysis of alternative compensatory mechanisms, Diwan and Shafik look at current cash transfers, debt-for-nature swaps, technology transfers, and sanctions for nature (this is retaliatory or conditional rather than compensatory). The only one of these mechanisms that is not accompanied by adverse side effects is the transfer of clean or pollution-reducing technology. Under the assumptions of the model developed by Diwan and Shafik, the negative effects of inappropriate compensatory mechanisms can be significant. This analysis stresses the importance of making efficient choices once a policy course has been decided on.

Piritta Sorsa examines how the rules of the General Agreement on Tariffs and Trade (GATT) deal with environmental issues. She explores the GATT rules on border adjustments (nondiscrimination and national treatment), public policy exceptions, the standards codes, and rules on dumping, subsidies, and countervailing duties. Sorsa concludes that, since trade itself is rarely the source of an environmental problem, there is little sense in using trade policy to address such problems. It seems that the GATT poses little threat to the pursuit of legitimate environmental objectives (in contrast to hidden protection). At most, the GATT may be in need of a little clarification, as with the rules on border adjustments, where an incentive is provided for the suboptimal use of environmental taxes.

According to Stewart Hudson, one approach would be for the GATT and other international agreements and protocols to make reforms in anticipation of the trend among nations to adopt process standards and trade measures that affect both natural resources and manufactured goods. Rather than fight the tide, GATT and trade negotiators should work on how to avoid the use of process standards as protectionist devices.


Selected papers presented at the conference on international trade and the environment

"Trade Policy and Industrial Pollution in Latin America: Where Are the Pollution Havens?" by Nancy Birdsall and David Wheeler (Comments by Gunnar Eskeland)

"Investment, Technology, and the Global Environment: Towards International Agreement in a World of Disparities," by Ishac Diwan and Nemat Shafik (Comments by Ravi Kanbur)

"Trade, Environment, and the Pursuit of Sustainable Development," by Stewart Hudson (Comments by Charles Pearson)

"Trade Policy and Pollution," by Patrick Low and Raed Safadi (Comments by David Robertson)

"Do 'Dirty' Industries Migrate?" by Patrick Low and Alexander Yeats


"The Environment as a Factor of Production: The Economic Growth and Trade Policy Linkages," by Ramon Lopez (Comments by Sweder van Wijnbergen)

"Tropical Forests and Trade Policy: The Case of Indonesia and Brazil," by Carlos Primo Braga (Comments by Judith M. Dean)

"Economic Growth and Environment," by Marian Radetzki (Comments by Charles Blitzer)

"Trade and the Environment: Harmonization and Technical Standards," by David Robertson (Comments by Nemat Shafik)

"GATT and Environment: Basic Issues and Some Developing Country Concerns," by Piritta Sorsa (Comments by J. Michael Finger)

"Prices, Policies, and the International Diffusion of Clean Technology: The Case of Wood Pulp Production," by David Wheeler and Paul Martin (Comments by Ishac Diwan)
New Research

The research projects described here have been approved by the Research Committee and are funded by the Bank's Research Support Budget (RSB). Bank units contribute their staff time to these projects, and RSB funding complements this by providing for such expenses as consultants, data collection, and travel. For information on funding approved for the preparation of research proposals, see page 11.

For information about research projects listed here, contact the researchers at the Bank's main address.

Research Starts

Gender-Specific and Age Cohort-Specific Education Stock for Developing Countries
Elizabeth King
Education and Social Policy Department
Ref. no. 677-69

A principal objective of education policy in developing countries over the past two decades has been to provide basic education to all segments of society. The basis for this objective is the substantial evidence of the benefits of education to society and to individuals: it improves health, and thus productivity and the quality of life; it increases people's access to paid employment; and it enhances their ability to communicate and coordinate activities with others.

There is also evidence of specific benefits that result from educating women. Schooling for females enhances the welfare of children because of the close link between mothers' welfare and that of their children. Educated women tend to have smaller families, and their children have a higher probability of survival and are often healthier and better educated. Countries with higher female enrollment rates have shown higher levels of economic productivity, lower fertility and infant and maternal mortality rates, and longer life expectancy than countries with lower female enrollment rates.

Most of the studies that have produced this evidence used enrollment rates to measure educational levels because estimates of the total education stock have not been available for most countries. Recently, however, a Bank study constructed an education stock series for 86 countries by using a perpetual inventory method. Past enrollments were summed up and corrected for school repetition and dropout rates and for mortality rates.

This research project will extend the earlier study by constructing a gender-differentiated education stock series. This series will help in distinguishing the benefits of educating women from those of educating men, and in testing whether there are significant differences between those benefits. And to help sharpen the analysis of the social benefits of educating women, the study will calculate age cohort-specific stocks of education. This would allow the study to test whether, for example, infant mortality is more highly correlated with the education stock of women of childbearing age than with that of older women or the labor force as a whole.

RSB support: $18,500
Staff weeks: 6

Subnational Finance in Transition Economies: Broadening the Framework for Analysis
Christine Wallich
Policy Research Department, Public Economics Division
Ref. no. 677-70

Fiscal decentralization is taking place in many of the formerly socialist countries undergoing the transition to a market economy, with local governments taking on growing responsibilities for expenditures. The outcome of the reforms in the fiscal relationship between central and local governments is important. Intergovernmental relations are closely tied in with the major reform issues of privatization, stabilization, and the social safety net.

Traditional analysis of intergovernmental finance examines the fiscal functions of local and central governments in terms of their roles in income distribution, expenditures, the assignment of tax functions, and so on. Governments in transitional economies play these roles, but they also have other roles that traditional analysis neglects. For example, the traditional view sees local governments primarily as service providers that finance themselves through user fees and local taxes and ignores their important role in most transitional economies as producers of goods and owners of enterprises.

This research project will address issues of intergovernmental finance in transitional economies, and explore the need for a broader framework of analysis for these issues in such economies. The research will combine empirical analysis and case studies, building on earlier research on China, Hungary, Romania, and Russia. It will look at the relationships between fiscal decentralization, privatization, macroeconomic stability, the safety net, and the need to develop new systems of local government finance, including intergovernmental transfers and local taxes and user fees.

An important set of issues is emerging as a result of the shifting responsibilities of governments in transitional economies. As privatization of state-owned enterprises-
proceeds, local governments also face a need to take on social services previously provided by state-owned enterprises. Local governments’ growing expenditures and declining revenues have led to demands for increased transfers from equally hard-pressed national governments. These transfers need to be defined in the emerging local and intergovernmental finance systems. In the interim, local governments are holding on to their enterprises—the sure, traditional source of revenue—rather than privatizing them. They are also turning to extrabudgetary sources—credit and arrears—with consequences for macroeconomic stability. Failure to take the new responsibilities of the subnational sector into account in designing an intergovernmental fiscal system will impede the process of privatization, impair the safety net, and threaten macroeconomic stability.

RSB support: $19,000
Staff weeks: 60

Abandonment of the Fixed Exchange Rate Regime in Latin America
Demetris Papageorgiou
Latin America and the Caribbean, Country Department I, Country Operations Division
Ref. no. 677-71

Since the 1980s a growing number of Latin American countries that had maintained a fixed exchange rate regime for many years have been switching to a more flexible regime—a passive crawl or frequent maxi-devaluations. This change has usually been accompanied by a permanent increase in inflation, as in Costa Rica, the Dominican Republic, Ecuador, Venezuela, and other small economies in the region.

This project will investigate why these countries abandoned the fixed exchange rate regime, and how that choice has affected their external competitiveness and macroeconomic performance. Did they make the switch in response to the large adverse external shocks of the early 1980s—the debt crisis combined with deteriorating terms of trade—or as a way to raise seigniorage to finance the negative net external transfers that followed the nationalization of the external debt? Did the rise in inflation in most of these countries result from larger budget deficits or from the change in exchange rate regime? And why was the increase in inflation permanent?

The research will look at how the fixed exchange rate regime functioned in the 1970s and analyze the pressures that led to its demise, including those stemming from domestic policy conditions (fiscal expansion, public debt). It will investigate the possibility that there was a change in philosophy in which external competitiveness was given priority over price stability. If the change in exchange rate regime is found to be in itself inflationary and was in fact effected to improve competitiveness, this implies a tradeoff between competitiveness and inflation in the absence of offsetting policies.

To see how the change in exchange rate regime has affected the countries’ competitiveness and macroeconomic performance, the research will compare the performance of the main macroeconomic indicators—growth, inflation, fiscal accounts, the real exchange rate, the balance of payments—and the sectoral composition of output before and after the change in regime. And it will compare the performance of the countries that abandoned the fixed exchange rate regime, before and after the switch, with that of two control groups—economies in the region that had moved earlier to a more flexible regime and those that stayed with a fixed exchange rate regime. This comparison will show both the gains in competitiveness and the costs in inflation under the new regime.

The findings of the study should be relevant for economies in other regions that follow a fixed exchange rate policy, and should provide lessons on ways to avoid changes in exchange rate policy that have a permanent effect on inflation.

RSB support: $39,000
Staff weeks: 35

Labor Markets and Employment Issues: Kenya and Côte d'Ivoire
Dipak Mazumdar and Gurushri Swamy
Africa Regional Office, Office of the Chief Economist
Ref. no. 677-73

This research will examine survey data from Côte d'Ivoire and Kenya to investigate policy-relevant issues relating to the labor market. The research will draw on data for Côte d'Ivoire from Living Standards Measurement Study surveys, and for Kenya chiefly from the Urban Labor Force Survey of 1986 and the Rural Labor Force Survey of 1988-90. The issues to be investigated can be organized into three sets based on the area of policy that they inform.

The first set of issues will contribute to the evaluation of wage policies, and of price policies as they affect rural earnings. The research will look first at the size structure of employment in the formal and informal sectors, in both rural and urban areas, and at its changes over time. Next, it will examine changes in the pattern of earnings in the different sectors. The findings, combined with the
data on changes in employment, will enable the researchers to test the recent hypothesis that wage differentials among sectors have virtually disappeared. The findings will also throw light on earning (and possibly productivity) in the large informal sector, about which there is little information.

The research will then look at labor migration. In the 1960s wages in Kenya’s urban formal sector were markedly increased to stabilize the labor force and thus improve productivity. The project will investigate whether the fall in formal sector wages since then and the squeezing of wage differentials among sectors have had an effect on the permanent urban settlement of the work force. It will investigate whether circulatory migration has declined in the past decade as a result of the shrinking cushion provided by the rural sector to marginal urban workers. And it will investigate how mobile labor is—how easily it can move between jobs and sectors without serious problems in earnings and employment.

The second set of issues is relevant to policies affecting the supply side of the labor market, principally education and training policies. Here the research will look at whether there have been changes in returns to education and in wage differentials between different occupations.

Finally, the third set of issues should help bring into focus the importance of regional policies, such as interregional transfers and policies encouraging alternative growth poles. The research will analyze regional variations in income and interregional flows of labor. This analysis, combined with data on regional variations in population density and cropping patterns, should help in understanding the patterns of, and constraints to, migration.

RSB support: $38,500
Staff weeks: 50

Research has shown that the fragmentation of financial markets in Africa impedes mobilization of financial resources and financial intermediation. Defined as a lack of integration between financial market segments, fragmentation is indicated by wide differences in interest rates (both between segments and between savers and borrowers), little flow of funds between segments, and lack of access of most clients to a wide range of financial instruments and institutions.

In Africa fragmentation has been attributed in large part to repressive financial policies and to structural and institutional features associated with low economic and financial development. Reforms aimed at liberalizing the financial sector have had only limited—or, at best, delayed—effect on domestic resource mobilization and on access to finance for Africa’s potentially dynamic small investors, who operate mostly outside the formal financial system.

The central question of this research project is: What explains the existence of dualism in African financial markets, and its persistence despite liberalization of those markets? The research will seek to identify policy, structural, and institutional measures that can accelerate (or impede) financial integration, deepening, and intermediation in African countries. Recent research on the causes of fragmentation has focused on imperfect information as a source of structural market failure. The costs to formal institutions of obtaining information on and transacting business with small clients and informal financial agents can be high.

In investigating alternative explanations for fragmentation and ways to improve integration, this research will focus on the costs and risks of financial transactions between different segments and on the incentives for such transactions. It will develop hypotheses explaining different aspects of fragmentation and test them with data gathered through questionnaires administered in four African countries—Ghana, Malawi, Nigeria, and Tanzania—in the formal and informal sectors, in urban and rural locations, and to clients and institutions.

RSB support: $148,800
Staff weeks: 39

Economic policy analysis has historically focused on the domestic economy. But as the world economy has become more integrated, economic shocks caused by changes in the global environment have become more important. In large industrial countries, external shocks can cause deviations in gross domestic product as large as 2 percent, and in some developing countries, 10 percent or more.

Earlier World Bank research looked at how three kinds of external shock—those caused by shifts in terms of trade, changes in global demand, and variations in interest rate—affected the current...
accounts of different countries, and at how the countries responded. It found that the size of a shock’s effect on a country depends on the country’s openness to trade, the composition of its imports and exports, and the size of its external debt. To respond to external shocks, some countries combined an export-promotion strategy with tightened domestic demand to improve the balance of payments. And some relied on external financing, often suffering major problems with external balances in the medium term as a result.

This research will extend and refine the earlier research, on both the theoretical and the empirical side. On the theoretical side, the research will construct an intertemporal dynamic general equilibrium model to test how different policy interventions—such as tariffs, quotas, indirect taxes, and investment subsidies—affect welfare. It will also test how shocks to factor endowments, technology, world prices, and the world interest rate affect welfare, output, the real exchange rate, and the balance of payments. And it will investigate how the assumption that wages are sticky in the short run—so that unexpected shocks lead to transitional unemployment—affect the conclusions reached in the first two theoretical tests.

On the empirical side, the research will introduce greater disaggregation into the data on exports, imports, and level of economic activity for the countries included in the data base, to produce more precise results on policy responses and their results. The results of the research are expected to yield some insights into appropriate policy responses to external shocks.

**Exchange Rate Commitments and Central Bank Independence**

Miguel Kiguel
Policy Research Department, Transition and Macro-Adjustment Division
Ref. no. 677-77

This research will examine the substitutability or complementarity between exchange rate regimes and central bank independence as commitment devices to help maintain policies aimed at price stability. It will complement earlier research that demonstrated the importance of central bank independence for price stability in developing and industrial countries, and for growth in developing countries.

The study will use accommodation of money growth to past inflation as the key (inverse) indicator of the degree to which a central bank pursues policies to achieve price stability. Focusing on accommodation, rather than inflation outcomes, will enable the researchers to obtain a clearer picture of the determinants of the central bank's policy stance on inflation. It will allow them to estimate jointly and compare the effects of central bank independence and different types of exchange rate arrangements on the tendency to accommodate.

The research will be conducted in two steps. First, for a sample of about 60 countries at all income levels, accommodation equations will be estimated in which high-powered money growth is regressed on domestic and foreign inflation or past wage inflation, or both. Second, the measures of accommodation from those equations will be related to central bank independence and to type of exchange rate regime.

**Household Responses to Seasonal Income Fluctuations in Rural India**

Emmanuel Jimenez
Policy Research Department, Poverty and Human Resources Division
Ref. no. 677-80

Fluctuation across seasons in the income of agricultural households is a common feature of poor agrarian economies, yet little is known about its consequences. This project will examine how households cope with seasonal fluctuations in income in three villages in India. The objective is to draw general lessons for the measurement and alleviation of poverty, and to learn about the structure of rural financial markets.

The research will address three main questions. First, to what extent do households smooth their consumption across agricultural seasons? Second, how is this smoothing accomplished? Do households rely on credit markets, nonmarket transfers, or potentially more costly strategies? And third, do credit transactions and nonmarket transfers play distinct roles in buffering seasonal income fluctuations, or are they direct substitutes for each other?

The project will draw for its analysis on the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) survey in India, which provides panel data on household consumption expenditures, debt, intrahousehold transfers, and income over several years.

The project is expected to contribute to the research on risk and social policy: Can consumption smoothing be achieved through...
private means? If not, or if households pursue very costly strategies (such as withdrawing children from school in lean times), then there is a potential role for government policy. Knowing which strategies households adopt to buffer fluctuations in income is critical in evaluating the costs and benefits of policy interventions. If seasonal consumption transfers—market and nonmarket—play a central role, then income stabilization or seasonal employment programs may be offset by reductions in private transfers.

In rural India and elsewhere, consumption transfers between family members coexist with credit market transactions. Thus, knowing whether these mechanisms perform distinct roles or are direct substitutes would help in assessing the effect of rural credit programs. And it might also shed light on why family-based insurance strategies are ultimately eclipsed by market institutions as an economy develops.

RSB support: $31,000
Staff weeks: 16

Research Proposals under Preparation

Infrastructure Inadequacies in Mexico
David de Ferranti
Latin America and the Caribbean, Country Department II, Country Operations Division 1
Ref. no. 677-78
RSB support: $10,000

The Economics of Clean Technology Diffusion in Developing Countries
David Wheeler
Environment Department, Pollution and Environmental Economics Division
Ref. no. 677-79
RSB support: $14,900

To order World Bank publications in the United States, send prepaid orders, plus $3.50 for shipping and handling, to World Bank Publications, P.O. Box 7247-8619, Philadelphia, PA 19170-8619, USA.

World Bank publications are available through a network of distributors outside the United States. For the name and address of the distributor in your country, write to the World Bank Publications Sales Unit, Department PR, 1818 H Street, Northwest, Washington, DC 20433.

Books

Avishay Braverman, Ravi Kanbur, and others
120 pages/Order Stock #12054/$6.95
This volume gives the results of a World Bank research project on agricultural price stabilization in Brazil. Researchers examined five Brazilian markets—beans, cotton, corn, rice, and wheat—to study the effects of price bands, which are designed to limit the size of price fluctuations. They analyzed two principal price band proposals, one that sets no limits and establishes a free trade environment, and one that sets some limits once a free trade environment has been established. The analysis of these two proposals together shows how price bands may affect producers and consumers.

The project also examined the ways in which different analytical methodologies can gauge the effects of stabilization measures in single markets and multiple markets. A key methodology examined was that developed by Newbery and Stiglitz in their book The Theory of Commodity Price Stabilization (Oxford: Clarendon Press, 1991).

The project investigated whether the Newbery-Stiglitz approach, which found international price stabilization schemes undesirable for both producers and consumers, would lead to the same conclusions when applied to a single country, such as Brazil.

Policymaking in the Open Economy: Concepts and Case Studies in Economic Performance
Rudiger Dornbusch, ed.
Published for the World Bank by Oxford University Press
272 pages
Paper: Order Stock #60985/$14.95
Hardcover: Order Stock #60884/$28.95
This collection of essays reviews national policies that critically influence economic performance in developing countries. It describes principles that shape good economic policy and illustrates them with case studies.

In an overview, the volume editor explains why poor countries need sound government policies to offset unfavorable conditions, including scant natural resources, adverse export prices, and limited access to world markets. He examines problems that occur with monetary and exchange rate policies and financial sector reform.

The volume develops the basic rules for monetary policy in an open economy, and describes the different ways in which financial reform and financial repression affect an economy. And it describes practical ways to deal with foreign exchange markets, including such arrangements as multiple exchange rates for commercial transactions and dual rates that distinguish between commercial and financial transactions.

The book examines the relation between budget deficits and money creation and suggests management strategies for developing sound economic policy that include advice on inflation control, international trade, import restrictions, income tax rates, and price and wage controls.
The articles summarized in this Journal section appear in the January issue of the World Bank Economic Review. Subscription to the Review is available without charge to readers with mailing addresses in countries that are not members of the OECD but are members of the World Bank. Other subscription requests should be directed to the World Bank Publications Sales Unit, Department PR, 1818 H Street, NW, Washington, DC 20433.

World Bank Economic Review
Volume 7, Number 1
January 1993

External Shocks, Purchasing Power Parity, and the Equilibrium Real Exchange Rate
Shantayanan Devarajan, Jeffrey D. Lewis, and Sherman Robinson

Two approaches are commonly used to determine the equilibrium real exchange rate in a country after external shocks: purchasing power parity calculations and the Salter-Swan, tradables-nontradables model. There are theoretical and empirical problems with both approaches, and tensions between them. The authors resolve these theoretical and empirical difficulties by presenting a model that is a generalization of the Salter-Swan model and that incorporates imperfect substitutes for both imports and exports. Within the framework of this model, the definition of the real exchange rate is consistent both with that of the purchasing power parity approach and with that of the Salter-Swan model (suitably extended). The authors' model, however, is capable of capturing a richer set of phenomena, including terms of trade shocks and changes in foreign capital inflows. It also provides a practical way to estimate changes in the equilibrium real exchange rate, requiring little more information than is required to do purchasing power parity calculations. The results are consistent with those of multisector computable general equilibrium models, which generalize the trade specification of the small model.

Moderate Inflation
Rudiger Dornbusch and Stanley Fischer

Inflation persists at moderate rates of 15 to 30 percent in all the countries that successfully reduced triple-digit inflations in the 1980s. Several other countries—for example, Colombia—have experienced moderate inflation for prolonged periods. Theories of persistent inflation can be classified into those that emphasize seigniorage as a source of government finance and those that emphasize the costs of ending inflation. The authors examine the sources and persistence of moderate inflation episodes. Most episodes of moderate inflation were triggered by commodity price shocks and were brief; very few ended in higher inflation. This article presents case studies of eight countries, including three that now suffer from moderate inflation and four that successfully moved down to single-digit inflation rates. The roles of seigniorage, indexation and disinflation, the exchange rate commitment, and monetary and fiscal policy are examined. The evidence suggests that seigniorage plays no more than a modest role in the persistence of moderate inflations and that such inflations can be reduced only at a substantial short-term cost to growth.

Theoretical Implications of Imperfect Competition on Quota License Prices and Auctions
Kala Krishna

This article looks at the implications for trade policy of recent work on quota auctions. Recent work has considered a variety of market structures in addition to the standard one of monopoly in the product market. It has also emphasized details of the implementation process, as well as the timing of decisions and dynamic factors. Such considerations are shown to be important, because they can greatly affect the outcome of trade policies.

Obstacles to Developing Indigenous Small and Medium Enterprises: An Empirical Assessment
Brian Levy

This article reports the results of field surveys conducted in Sri Lanka's leather industry and Tanzania's furniture industry. It outlines an approach to learning how small and medium-size enterprises perceive the impact of financial, regulatory, technical, marketing, and other input constraints, and to evaluating the results in relation to other empirical indicators. Lack of access to finance emerges as the binding constraint for smaller, less established firms in Sri Lanka and for all of Tanzania's small and medium-size enterprises—not only is informal financing limited for Tanzania's firms, even firms of adequate size and experience have difficulty borrowing from banks, and, if they do borrow, have difficult relations with their lenders. In Tanzania regulatory and tax constraints appear largest for the smallest firms, declining somewhat as firms grow: because enforcement is comprehensive, the regulatory burden of negotiating with government officials is greatest for small firms. By contrast, in Sri Lanka the regulatory burden rises with firm size, because enforcement is more stringent for the larger and more visible firms. Constraints on physical inputs continue to inhibit...
small and medium-size enterprises in Sri Lanka—a legacy of excessive vertical integration by parastatals. Technical constraints are appraised as most significant by relatively educated entrepreneurs with some involvement in high-quality market niches.

**Estimating Returns to Scale with Large, Imperfect Panels: An Application to Chilean Manufacturing Industries**

*M. Daniel Westbrook and James R. Tybout*

This study exploits plant-level panel data from Chile to provide new evidence on the empirical significance of scale economies in manufacturing sectors. Particular emphasis is given to econometric problems induced by the presence of unobservable plant heterogeneity, measurement error, and selectivity. An analysis of the results suggests that estimates based on generalized method of moments estimators that pool long differences (which eliminate heterogeneity effects) are robust to measurement error in the capital stock, heteroskedasticity, and selectivity. Returns to scale for three-digit industries are fairly evenly distributed over the plausible range of 0.8 to 1.2, and none is statistically significantly different from constant returns. Similar results hold for the four-digit industries for which sufficient data are available. Although general expansion of the manufacturing sector cannot be expected to yield strong plant-level scale economies, the study’s results do not rule out scale economies from other sources, such as the spreading of start-up costs and external returns to scale. Finally, the analysis has generated several findings of methodological interest, including the notion that Stigler’s survival test may indeed be useful as a quick first pass on the empirical importance of returns to scale.

**Discussion, Technical, and Related Papers**

**Food and Agricultural Policy Reforms in the Former USSR: An Agenda for the Transition**

*Studies of Economies in Transformation 1*

This report reviews the disintegrating food and agricultural sector of the former Soviet Union and outlines a comprehensive plan for its reform. The plan proposes policies to reverse the sector’s collapse—policies that would replace central planning with market-based practices.

The plan, which was devised by a team of international experts led by the World Bank, is divided into three parts. First, a reform strategy for the short term seeks to ensure adequate food supply and distribution while phasing in structural reforms. The reforms address policies governing trade, pricing, subsidies, and credit during the transition. Included are initial land reforms, privatization of enterprises, and a social safety net to protect vulnerable groups during the transition.

Second, a reform strategy for the medium term proposes restructuring farms and enterprises while optimizing the conditions for a sound market system. This agenda includes building on the initial trade policy reforms, developing an expansive rural credit system, and providing government aid to agricultural and food-producing institutions.

And third, a strategy for support from the international community and foreign investors describes ways that they can help speed reforms. It suggests short-term aid for food imports and other products, lists investment opportunities in food and agriculture, and identifies needs in technical assistance and training.

**Assessing Development Finance Institutions: A Public Interest Analysis**

*Jacob Yaron*

World Bank Discussion Paper 174

45 pages | Order Stock #12203/$6.95

This paper suggests that conventional accounting procedures cannot accurately measure the cost of subsidizing development finance institutions. It argues that past assessments of the performance of such institutions give a poor picture of their operating costs.

The author provides an alternative, user-friendly tool—the Subsidy Dependence Index. This index allows a more complete analysis of the financial performance and subsidy dependence of a development finance institution. It measures the social costs of operating such an institution, including all subsidies it receives.

The Subsidy Dependence Index uses a three-part strategy. It examines all the subsidies received by a development finance institution against the interest earned on the institution’s loan portfolio. It tracks the progress an institution makes in reducing its dependence on subsidies. And it compares the subsidy dependence of institutions working under similar circumstances.

The Subsidy Dependence Index will enable policymakers and others to measure the extent to which subsidies affect a development finance institution's performance and to record such subsidies in the institution’s income statement. It will enable them to measure the overall subsidy received by an institution against its earned interest. And it will even allow them to compute the capital costs of an institution’s equity.

For World Bank staff, the index will have additional usefulness, as it outlines ways to measure progress made in the subsidy reforms required in some of the Bank's financial sector operations.
Policy Research Working Papers

Working Papers disseminate the findings of work in progress and encourage the exchange of ideas among Bank staff and all others interested in development issues.

Another Look at Population and Global Warming
Nancy Birdsall
WPS1026 • Contact Soledad Rothschild, room N11-051, tel. 202-473-7460.

Measuring Welfare Changes from Commodity Price Stabilization in Small Open Economies
Jonathan R. Coleman and Chris Jones
WPS1021 • Contact Dawn Gustafson, room S7-044, tel. 202-473-3714.

A New Approach to Evaluating Trade Policy
James E. Anderson and J. Peter Neary
WPS1022 • Contact Maria Teresa Sanchez, room S7-025, tel. 202-473-3731.

An Exact Approach for Evaluating the Benefits from Technological Change
Will Martin and Julian M. Alston
WPS1024 • Contact Dawn Gustafson, room S7-004, tel. 202-473-3714.

Openness and Economic Performance in Sub-Saharan Africa: Evidence from Time-Series Cross-Country Analysis
Kazi M. Matin
WPS1025 • Contact Dawn Ballantyne, room N10-019, tel. 202-473-8004.

Financial Liberalization and Adjustment in Chile and New Zealand
Paul D. McNelis and Klaus Schmidt-Hebbel
WPS1026 • Contact Anna Marañon, room N11-042, tel. 202-473-1450.

Lessons from Bank Privatization in Mexico
Guillermo Barnes
WPS1027 • Contact Wilai Pityatonakarn, room N9-003, tel. 202-473-7664.

Socioeconomic and Ethnic Determinants of Grade Repetition in Bolivia and Guatemala
Harry Anthony Patrinco and George Psacharopoulos
WPS1028 • Contact Liliana Longo, room I4-187, tel. 202-473-9244.

Controlling Tropical Deforestation: An Analysis of Alternative Policies
Robert T. Deacon
WPS1029 • Contact Peggy Pender, room N10-067, tel. 202-473-7938.

Alan J. Kramnick
WPS1030 • Contact Peggy Pender, room N10-067, tel. 202-473-7851.

How Import Protection Affects the Philippines' Motor Vehicle Industry
Wendy E. Takacs
WPS1035 • Contact Dawn Ballantyne, room N10-023, tel. 202-473-7947.

Output Decline in Hungary and Poland in 1990-91: Structural Change and Aggregate Shocks
Simon Commander and Fabrizio Coricelli
WPS1036 • Contact Olga del Cid, room M3-047, tel. 202-473-5195.

Vocational Secondary Schooling, Occupational Choice, and Earnings in Brazil
Ana Maria Arriagada and Adrian Ziderman
WPS1037 • Contact Cynthia Cristobal, room S6-214, tel. 202-473-3640.

Determinants of Expatriate Workers' Remittances in North Africa and Europe
Ibrahim A. Elbadawi and Robert de Rezende Rocha
WPS1038 • Contact Anna Marañon, room N11-025, tel. 202-473-1450.

Education, Externalities, Fertility, and Economic Growth
Martin Weale
WPS1039 • Contact PHREE, room S6-214, tel. 202-473-3680.

Lessons of Trade Liberalization in Latin America for Economies in Transition
Jaime de Melo and Sumana Dhar
WPS1040 • Contact Dawn Ballantyne, room N10-023, tel. 202-473-7947.

Family Planning Success Stories in Bangladesh and India
Moni Nag
WPS1041 • Contact Otilia Nadori, room S6-065, tel. 202-473-1091.

Family Planning Success in Two Cities in Zaire
Jane T. Bertrand and Judith E. Brown
WPS1042 • Contact Otilia Nadori, room S6-065, tel. 202-473-1091.

Deriving Developing Country Repayment Capacity from the Market Prices of Sovereign Debt
Stijn Claessens and George Pomerleano
WPS1043 • Contact Rose Vo, room S8-042, tel. 202-473-3722.

Working Papers are NOT available through the Publications Department. Please address requests for papers to the contact person indicated at the Bank's main address.
Hospital Cost Functions for Developing Countries
Adam Wagstaff and Howard Barnum
WPS1044 • Contact Otilia Nadora, room S6-065, tel. 202-473-1091.

Social Gains from Female Education: A Cross-National Study
Kalanidhi Subbarao and Laura Raney
WPS1045 • Contact Maria Abundo, room S2-270, tel. 202-473-6820.

World Bank Project-Financed Research on Population, Health, and Nutrition
J. Price Gittinger and Carol Bradford
WPS1046 • Contact Otilia Nadora, room S6-065, tel. 202-473-1091.

Côte d'Ivoire: Private Sector Dynamics and Constraints
Enrique Rueda-Sabater and Andrew Stone
WPS1047 • Contact Priscilla Infante, room N9-059, tel. 202-473-7622.

Targets and Indicators in World Bank Population Projects
George Baldwin
WPS1048 • Contact Otilia Nadora, room S6-065, tel. 202-473-1091.

Money Demand and Seignorage-Maximizing Inflation
William Easterly, Paolo Mauro, and Klaus Schmidt-Hebbel
WPS1049 • Contact Rebecca Martin, room N11-021, tel. 202-473-1448.

Marginal Income Tax Rates and Economic Growth in Developing Countries
William Easterly and Sergio Rebelo
WPS1050 • Contact Rebecca Martin, room N11-021, tel. 202-473-1448.

The Legal Framework for Private Sector Activity in the Czech and Slovak Federal Republic
Cheryl W. Gray
WPS1051 • Contact Maxine Berg, room N11-021, tel. 202-473-6969.

A Reappraisal of How Oral Rehydration Therapy Affected Mortality in Egypt
Hoda Rashad
WPS1052 • Contact Otilia Nadora, room S6-065, tel. 202-473-1091.

Development of the Zimbabwe Family Planning Program
Alex F. Zinanga
WPS1053 • Contact Otilia Nadora, room S6-065, tel. 202-473-1091.

Distributional Impact of Cash and In-Kind Social Transfers in Eastern Europe and Russia
Branislav Milanovic
WPS1054 • Contact Sabah Moussa, room N11-017, tel. 202-473-9019.

Wealth, Weather Risk, and the Composition and Profitability of Agricultural Investments
Mark R. Rosenzweig and Hans P. Binswanger
WPS1055 • Contact Caroline Banton, room I4-049, tel. 202-473-4783.

Earnings and Education in Latin America: Assessing Priorities for Schooling Investments
George Psacharopoulos and Ying Chu Ng
WPS1056 • Contact Liliana Longo, room I4-187, tel. 202-473-9244.

Measuring the Incomes of Economies of the Former Soviet Union
Socio-Economic Data Division, International Economics Department
WPS1057 • Contact Estela Zamora, room S7-136, tel. 202-473-3706.

The Pricing of Country Funds and Their Role in Capital Mobilization for Emerging Economies
Isach Diwan, Vishan Errunza, and Lemma W. Senbet
WPS1058 • Contact Rose Vo, room S8-042, tel. 202-473-1047.

Political Economy of Policy Reform in Turkey in the 1980s
Ziya Onis and Steven B. Webb
WPS1059 • Contact Sharon Gustafson, room I5-193, tel. 202-473-7856.

Economies of the Former Soviet Union: An Input-Output Approach to the 1987 National Accounts
Dimitri Steinberg
WPS1060 • Contact Estela Zamora, room S7-136, tel. 202-473-3706.

Dynamic Response to Foreign Transfers and Terms-of-Trade Shocks in Open Economies
Klaus Schmidt-Hebbel and Luis Serven
WPS1061 • Contact Anna Maranon, room N11-039, tel. 202-473-1450.

Economic Development, Environmental Regulation, and the International Migration of Toxic Industrial Pollution, 1960-88
Robert E. B. Lucas, David Wheeler, and Hemamala Hettige
WPS1062 • Contact the WDR office, room T7-101, tel. 202-473-1393.

Mongolia: Privatization and System Transformation in An Isolated Economy
Cedric Denizer and Alan Gelb
WPS1063 • Contact Aludia Oropesa, room N11-035, tel. 202-473-9075.

More Evidence on Income Distribution and Growth
George G. Clarke
WPS1064 • Contact Rebecca Martin, room N11-054, tel. 202-473-9065.

Strengthening Uganda's Policy Environment for Investing in University Development
Thomas Owein Eisenmon, John Sheehan, George Evoku, Franklin Van Buer, Delane Welsch, Louisa Masutti, Nat Colletta, and Lee Roberts
WPS1065 • Contact Cynthia Crisostobal, room S6-214, tel. 202-473-3640.

Pollution Control in a Decentralized Economy: Which Level of Government Should Subsidize What in Brazil?
Antonio Estache and Kangbin Zheng
WPS1066 • Contact Antonio Estache, room E10-081, tel. 202-458-1442.

Returns to Investment in Education: A Global Update
George Psacharopoulos
WPS1067 • Contact George Psacharopoulos, room I4-187, tel. 202-473-9243.

Enterprise Reform in Eastern Europe
Sweders van Wijnbergen
WPS1068 • Contact Bonnie Pacheco, room H11-071, tel. 202-473-7033.

Why Is There Proportionately More Enrollment in Private Schools in Some Countries?
Estelle James
WPS1069 • Contact Daniele Evans, room N9-061, tel. 202-473-7033.

Economic Fundamentals of Road Pricing: A Diagrammatic Analysis
Timothy Hau
WPS1070 • Contact Jennifer Francis, room S10-063, tel. 202-473-1005.

Congestion Charging Mechanisms: An Evaluation of Current Practice
Timothy Hau
Calendar

April

27-30—International Water Supply Association Specialized Conference on Quality Aspects of Water Supply in conjunction with Wasser Berlin '93, Berlin, Germany [Contact: IWSA, 1 Queen Anne's Gate, London SW1 H9BT, U.K., tel. (071) 957 4567, fax (071) 222 7243]

27-28—Fourteenth European Conference on Environmental Pollution (Aquatic and Atmospheric Environment, Air/Water Quality, Hazardous Wastes, and Hydrology), Helsinki, Finland [Contact: ALENCA, P.O. Box 1779, Cornwall, Ontario K6H 5V7, Canada, tel. (613) 932 7702]

May

3-4—Fifth World Bank Conference on Development Economics, Washington, DC, with sessions on financial policy, regulation, energy economics and the environment, and economic regress. A roundtable discussion on infrastructure is planned. Participation by non-World Bank staff by invitation only [Contact: Boris Pleskovic, Research Advisory Staff, World Bank, 1818 H Street NW, Room S3-031, Washington, DC 20433, tel. (202) 473 1062]

6-8—Second International Symposium on AIDS and Reproduction, Nice, France [Contact: Jean-Yves Gillet, Service de Gynecologie-Obstetrique et de Medecine de la Reproduction, Hopital Saint-Roch, 5 rue Pierre Devouly, 06031 Nice, France, tel. +33 92 03 33 08, fax +33 93 62 30 81]


June

9-11—International Conference on Chronic Diseases and Changing Care Patterns, Amsterdam, The Netherlands [Contact: Wien Limburg, Institute of Social Medicine, University of Amsterdam, Meibergdreef 15, 1105 AZ Amsterdam, The Netherlands]

15-18—ENERLAC '93: Energy Conference of Latin America and the Caribbean, 10th Colombian Energy Symposium—Energy and Development in an Interdependent World, Santa Fe de Bogota, Colombia [Contact: OLADE Headquarters, Avenida Occidental, Edificio OLADE, Quito, Ecuador, tel. (593 2) 538 122, fax (593 2) 539 684]

July


August

9-12—Fish Farming Technology '93, First International Conference, Trondheim, Norway [Contact: FFT93 Conference Office, Norwegian Institute of Technology, N-7034 Trondheim, Norway, tel. (477) 995 266. fax (477) 517 226]

17-20—International Symposium on Energy, Environment and Economy, Baku, Azerbaijan—to disseminate and discuss the latest research results in energy technology and the related environmental effects [Contact: F. Aliyev, Symposium Chairman, 123A Neftyanikov Avenue, Baku, Azerbaijan]

September

20-23—Towards Education for All, Brunei Darussalam—international conference to discuss, monitor, and exchange ideas on progress made toward implementing the resolutions of the Jomtien Conference for providing education for all [Contact: Secretary, Organizing Committee, “Towards Education for All,” Faculty of Education, University Brunei Darussalam, Gadong 3186 Brunei Darussalam, tel. (673) 2 427 001, fax (673) 2 427 003]