

# Where Credit Is Due

## *Allocating Credit to Advance Environmental Goals*

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*Credit allocation is a potentially useful instrument for environmental policy. The authors propose the establishment of a U.S. Environmental Finance Authority, modeled on existing institutions that support home mortgage lending. They also call for a fundamental redirection of international financial institution lending so as to support environmentally beneficial projects and policies in developing countries.*

**P**UBLIC POLICIES FOR CREDIT ALLOCATION are intended to alter the patterns of lending that would result if financial decisions were guided solely by the “free play” of market forces. These policies include both the lending by public-sector institutions, often at below-market rates, and the use of regulations and incentives to influence private-sector lending behavior.

The primary rationale for these interventions is to redress market failures caused by public goods and externalities, includ-

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ing those related to economies of scale and long-term time horizons. Another important set of market failures comprises those that result in socially undesirable environmental degradation. Although the use of credit allocation to advance environmental goals is natural, it rarely has been used for this purpose.

This article explores the potential for enlisting credit allocation to advance environmental goals. First, we discuss the need for public policies to advance environmental goals domestically and internationally. We then describe some of the most important techniques for credit allocation that are used in the U.S. economy. Finally, we explore several ways in which credit allocation could be harnessed for environmental goals: domestically, via the creation of an Environmental Financing Authority modeled on existing institutions that support home mortgage lending; and internationally, via the redirection of international financial institution lending away from the support of environmentally degrading projects and policies and toward environmentally beneficial ones.

## **Environmental Goals and Public Policy**

Environmental degradation threatens the well-being of current and future generations worldwide. It takes two broad forms: first, the depletion of natural *sources* of wealth, such as soils, forests, minerals, and biodiversity; and second, the abuse of environmental *sinks* via the indiscriminate discharge of wastes into water bodies, the air, and the global atmosphere.

### ***Environmental Degradation as Market Failure***

In mainstream economic theory, socially undesirable environmental degradation occurs because not all the costs and benefits of market activities flow to the buyers and sellers who engage in

the production, exchange, and consumption of a good or a service. Some costs and benefits accrue to third parties who are not involved in the market transaction. These “externalities” lead to inefficient outcomes. External benefits (or “positive externalities”) are underproduced, because those who generate them are not compensated for doing so. External costs (or “negative externalities”) are overproduced, because they are not borne by those who generate them.

Environmental sources and sinks are subject to both types of externalities—positive and negative. A few examples illustrate:

- Open-access natural resources such as ocean fisheries are subject to chronic overuse, resulting in harvests well below the biological potential, and in some cases leading to the extinction of commercially valuable species. In the absence of incentives to do so, individuals do not take into account the external costs their own extraction activities impose on others.<sup>1</sup>
- The many thousands of varieties of the world’s food crops constitute perhaps the single most important form of biodiversity from the standpoint of the well-being of future generations of humankind. The conservation and ongoing evolution of this crop genetic diversity is an enormously valuable service provided by peasant farmers worldwide, particularly in such historic centers of diversity as south-central Mexico and Guatemala in the case of maize, or eastern India and Bangladesh in the case of rice. Yet in the absence of incentives to continue providing this external benefit, peasants are today abandoning the cultivation of diverse crop varieties in favor of fewer “modern varieties” or nonagricultural pursuits.<sup>2</sup>
- Air and water pollution has numerous adverse effects, in-

cluding impacts on human health, forests and crops, wildlife, and materials such as buildings and statues damaged by acid rain. The polluter shares, at most, a minor fraction of these consequences. Most of the effects of discharging wastes into environmental sinks fall on others in the form of external costs.

- Carbon is stored (“sequestered”) in trees and other plants, thereby removing some carbon dioxide from the air and helping to counter global warming. Since farmers and forest owners receive no compensation for providing this external benefit, they have no incentive to factor it into their land-use decisions.

The first two cases exemplify negative and positive externalities, respectively, with respect to environmental sources. The second two are examples of negative and positive externalities with respect to environmental sinks (see Table 1). In each case, markets alone fail to provide adequate incentives for environmental management.

Of course, governments can fail too. In theory, market failures can be corrected by a variety of government interventions designed to induce or compel private actors to “do the right thing”—for example, to take environmental externalities into account in their decision-making. But in practice there is no guarantee that the government itself will do the right thing. The willingness and ability of governments to advance the public interest is filtered through the political process, and the government’s *de facto* definition of the public interest reflects the distribution of power in the society. International evidence suggests that countries with a more egalitarian distribution of power—as exhibited by the distribution of income, the extent of political rights and civil liberties, and the rate of adult literacy—tend to have better environmental quality.<sup>3</sup>

Table 1

### Examples of Environmental Externalities

Type of environmental resource	Type of externality	
	Negative	Positive
Source	Fisheries depletion; deforestation	Conservation and evolution of crop genetic diversity
Sink	Pollution of air and water	Carbon sequestration

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### *Policy Instruments*

There are three broad classes of policy instruments by which governments can seek to advance environmental goals: “command-and-control” regulations, the creation of market-based incentives, and credit allocation. To date, the first two classes of instruments have received far more attention than the third.

*Regulations* alter the rules of the game by requiring producers or consumers to act in ways designed to safeguard the environment. Emission standards, which limit the amount of pollution that factories or motor vehicles can release into the air, are one example. Mandated pollution-control technologies, such as scrubbers in smokestacks or catalytic converters in motor vehicle engines, are another. Historically, regulation has been the most important avenue by which governments have moved to protect the environment.

*Market-based incentives* operate not by regulating quantities, but by creating new prices. This is done through pollution taxes or tradable emission permits, both of which effectively put a price tag on emissions and then let firms and individuals decide how much to emit. This class of instruments has been advocated in recent decades by many economists, on the grounds that mar-

ket-based incentives can secure a given level of pollution reduction at a lower total cost than command-and-control regulations by allowing polluters who can cut emissions more cheaply to cut them more than those for whom pollution control is relatively expensive. The best-known example of putting this theory into practice in the United States is the sulfur dioxide-emission-permit trading scheme introduced in the 1990 Clean Air Act amendments.

*Credit allocation* has rarely been included in the environmental policy toolkit, in part because government responsibilities for finance and environmental protection are housed in different bureaucratic boxes. Indeed, it can be plausibly argued that in many instances credit allocation has *exacerbated* environmental degradation around the world by subsidizing everything from the construction of coal-burning power plants and aluminum mining to tropical deforestation and the nuclear power industry.<sup>4</sup> Yet, in principle, the purpose of credit allocation—whether via public-sector lending or interventions in private-sector financial markets—is to promote the internalization of externalities. In the past, the externalities targeted by credit allocation have mainly been those associated with public infrastructure, scale economies, and financial stability. But there is no reason that environmental externalities—both positive and negative—could not also be addressed with credit allocation policies.

### *The International Policy Arena*

These environmental policy instruments can be applied internationally as well as domestically. There is, of course, no international government to enact command-and-control regulations or to establish and manage market-based incentive systems, but both sorts of instruments can be adopted at the international level via negotiated intergovernmental agreements, such as the

1987 Montreal Protocol for phasing out the production and use of CFCs (chlorofluorocarbons) to protect the ozone layer or the 1997 Kyoto agreement to limit carbon emissions. Such agreements are, however, both time-consuming and difficult—as the failure of the U.S. Senate to ratify the Kyoto agreement illustrates—making these instruments most readily suited to domestic environmental policy.

Credit allocation may offer greater scope for advancing environmental goals at the international level, at least in the short run, since there are already established institutions to govern international finance. The World Bank and the International Monetary Fund (IMF), regional development banks, and bilateral aid and export-promotion agencies already provide international public-sector credit at below-market rates, and help to shape the regulation and incentive regime for international private-sector credit via negotiated agreements and conditionalities.

### **Credit Allocation: Objectives and Techniques**

Governments use a wide variety of techniques to allocate credit in support of economic and social objectives. Direct allocation of public funds using tax revenues or government borrowing is perhaps the most basic form of credit allocation, and it is often used to finance projects that private lenders shun because the risk is high or the private return low. But in Western market economies, concerns about the degree of state control and the tax burden have often constrained the use of public funds for lending. As an alternative, governments in these economies have relied heavily on credit allocation techniques that channel private savings to particular borrowers or sectors, using market-based institutions and instruments. These strategies, which allow policymakers to target diverse priority objectives, are deeply embedded in fiscal, monetary, and regulatory policy frameworks

in developed market economies and in many developing countries as well.

*Past and Current Objectives*

Strategies for channeling credit to particular sectors and borrowers have been developed to stabilize economies, aid priority

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borrowers, and pursue distributional goals. To stabilize the economy, governments can use quantity controls as a tool of monetary policy, setting overall limits on lending by private institutions and relaxing or tightening those limits as needed. Credit controls that promote institutional soundness also can contribute to macroeconomic stability. In the United States, for example, the use of credit controls reflects a long-standing awareness that overlending can lead to market failure: The National Bank Act of 1865 required that banks limit loans to individual borrowers to 10 percent of their capital. The Securities and Exchange Act of 1934 authorized the Federal Reserve to impose margin requirements, limiting the percentage of the value of corporate stocks that can be borrowed to purchase them. And, more recently, capital requirements for banks have been used to provide market discipline and to curb overlending.

Over the last two decades, the view that regulation should be used to stabilize credit expansion and contraction has fallen from favor. In the United States and other major industrial countries, central banks have adopted open-market operations as the pri-



mary monetary policy tool for stabilization purposes. But this practice can result in unequal effects on different borrowing sectors that are themselves destabilizing (Maisel 1973; U.S. House 1975; Pollin 1993; Palley 2000).

Moreover, institutional factors may lead to persistent allocative distortions. In countries dominated by large financial institutions and institutional investors, for example, large corporate borrowers have preferred access to bank loans and markets for both short- and long-term securities. U.S. strategies to counter this bias, so as to ensure a balanced flow of credit across the economy, include providing interest rate subsidies for loans, support for special-purpose agencies and institutions, and regulatory requirements that channel funds to small businesses, homeowners, and consumers.

After two decades of deregulation, the most important of the remaining U.S. regulatory requirements is the Community Reinvestment Act (CRA). Its objective is to ensure that a substantial share of funds that originate as deposits in a given community are re-lent there to meet local credit needs, including those of low- and moderate-income neighborhoods. A major strength of the CRA is that it provides opportunities to members of the community to voice concerns about the lending policies of depository institutions. Its major weakness is that it applies only to depository institutions and not to other financial sectors.

The divergent preferences of market participants create another obstacle to ensuring a balanced flow of credit. Creditors prefer short-term commitments; borrowers prefer longer maturities to free up a larger share of income to meet other obligations. Although private financial intermediation can solve this problem for some borrowers and lenders, not all borrowers have access to the long-term funding they need. In the United States it has been government, not the market, that has taken the lead in expanding access to long-term credit for a larger

number of borrowers. In the 1930s, for example, the Reconstruction Finance Corporation (RFC) and its subsidiaries introduced medium-term credits in lending to businesses, extending the then-traditional commercial bank loan with a ninety-day maturity to loans with maturities of up to five years. Similarly, the Federal National Mortgage Association—an RFC subsidiary now known as Fannie Mae—introduced the long-term, self-amortizing mortgage to replace the medium-term balloon mortgages that led to widespread defaults and bank failures in the 1930s (Patman 1969).

Promoting wider access to credit at reasonable cost has been a priority objective of U.S. policy since the early decades of the twentieth century. This approach has resulted in institutional structures, tax credits, and regulatory requirements that seek to address inequities in the way markets allocate credit—in particular, to lower-income homebuyers and consumers (D’Arista 1994). Credit allocation techniques also have been used by all industrial countries in the post–World War II era to direct credit to priority areas, including agriculture, housing, exports, industrial and regional development, transportation, and tourism.

### *Institutional Strategies*

The United States began using government-sponsored agencies to allocate credit when Congress established the Farm Credit System in the 1920s. A more ambitious effort was undertaken with the establishment of the Reconstruction Finance Corporation in the 1930s. Used first to recapitalize weak but solvent banks, the RFC evolved into a major lender to small businesses, homeowners, and state and local governments, and subsequently funded and operated agencies engaged in the war effort.

As noted above, the largest government-sponsored enterprise now in existence, Fannie Mae, began its operations under the

RFC umbrella. Not only did Fannie Mae survive the RFC's dissolution in 1954, but it went on to play a critical role in revitalizing housing finance in the 1970s and became the largest single borrower and lender in U.S. financial markets in the 1990s (Federal Reserve System 2000).

Fannie Mae and other government-sponsored enterprises (GSEs) dedicated to housing finance—the Federal Home Loan Mortgage Corporation (Freddie Mac) and the Federal Home Loan Bank Board—are able to raise funds at a lower cost than the private institutions they support by virtue of their quasi-governmental status and (limited) authority to borrow from the U.S. Treasury. Their support for private lenders became necessary in the 1970s as inflation and rising nominal interest rates eroded another major allocative strategy also created in the 1930s: the system of private savings and loan associations (S&Ls) that could lend only for housing (D'Arista 1994).

As they expanded the volume of mortgages purchased from private lenders, the GSEs developed techniques for pooling loans and issuing securities against them (“securitization”), which allowed them to tap the growing pool of long-term savings held by institutional investors such as insurance companies and pension funds. Government leadership in developing this important new tool was critical in providing a successful systemic adaptation to the shift in savings from depository institutions to institutional investors.

Variations of these U.S. combinations of government-sponsored agencies and private lending for housing have been developed in other countries as well, such as the United Kingdom and Sweden (Dymski and Isenberg 1998). In addition, almost all industrial countries have government-sponsored export-import banks that use tools such as tax preferences, insurance, and interest-rate subsidies to increase the flow of credit to sectors engaged in this priority activity.

Like the domestic agencies sponsored by national governments, the World Bank and the various regional development banks are able to borrow at below-market rates to lend to preferred borrowers because of their support from member governments. Thus they represent institutional strategies for allocating credit at the international level.

### *Quantity Controls*

In the United States, reserve requirements are used in conjunction with open-market operations to control bank lending and to influence the overall supply of credit. While many other countries have recently adopted open-market operations as their primary policy tool, they previously relied on directives or guidelines that set limits on the amount of credit that banks could extend within a given time period. The United States generally has not used that form of control as an overall policy tool, although it did so to limit banks' foreign lending in the period 1965–1974 as part of the effort to reduce balance-of-payments deficits (Brimmer 1975). But other central banks have a long history of using quantity controls both for restrictive purposes and to expand credit to preferred sectors. Their allocative strategies were implemented by waiving limits on loans to designated borrowers or by providing incentives to channel a larger share of the total increase to those borrowers.

Another strategy is the use of supplemental or asset-based reserve requirements. This technique requires institutions to hold non-interest-bearing reserves against loans in addition to (or instead of) deposits (see Pollin 1993 and Palley 2000). An institution can lower or eliminate the required reserves by lending to preferred sectors. If the institution does not lend to the preferred sectors, it is in effect making an interest-free loan to the government or central bank. For example, Sweden used this strat-

egy in the 1960s to maintain an even flow of credit to housing across the business cycle. All financial institutions—not just banks—were subject to the supplemental reserve requirement, which could be met by lending to the special-purpose institutions and others originating the loans (U.S. House 1972).

Quantity controls can take a variety of other forms. In addition to margin requirements for stock purchases, the amount

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*An institution can lower or eliminate the required reserves by lending to preferred sectors.*

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required for down payments on homes and consumer goods and the terms of loans may be regulated, with modifications from time to time so as to discourage or encourage new borrowing. Some countries use quantity controls to limit new issues of equities and bonds, and most have used blanket controls during wartime or other emergency periods. The U.S. Credit Control Act, for example, dates from World War I, was used again during World War II, and subsequently was reactivated in 1980 to brake inflation and the fall in the value of the dollar.

### *Price Adjustments*

Credit allocation can also be implemented through policies that lower the cost of credit to preferred sectors. This method is generally regarded as a tool of fiscal rather than monetary policy, and hence is administered by treasury departments or ministries of finance rather than central banks. This strategy includes such techniques as lowering or waiving taxes on loans (or taxes on the interest on loans) to preferred sectors, subsidizing interest payments on loans, and guaranteeing and insuring loans made by private lenders. These techniques are used heavily in the United States to reduce the cost of credit for state and local

governments, corporate and small businesses, farms, shipbuilders, home buyers, veterans, students, and other preferred borrowers. Because these market-based strategies generally do not involve the direct allocation of public funds, the loss of revenue is termed a “tax expenditure” and often is viewed as relatively costless. The potential cost of loan guarantees and other contingent liabilities associated with these programs may be considerable, however, in the event of a deep or prolonged recession.

## **Policy Options**

Many projects that advance environmental goals require long-term or concessional finance. In some cases—for example, the development of alternative or renewable sources of energy—there are substantial lags before projects will generate cash flows large enough to repay principal and interest. In other cases, such as loans to small farmers whose agriculture helps to preserve crop genetic diversity, cash flows may never be large enough to service loans on purely commercial terms. To date, there have been few efforts to use credit allocation to correct for the market’s failure to finance these and other environmental investments. In both national and international credit markets, only governments, top-rated corporations, and priority sectors already supported by credit-allocation techniques are able to borrow at long maturities and concessional rates (BIS 2000).

In the United States, one such priority sector has been private single-family mortgages. These account for one-third of total outstanding credit to private nonfinancial borrowers, and the debt of GSEs and federally related mortgage pools (over \$4 trillion) accounts for 15 percent of the outstanding debt of all sectors—government, private, and financial (Federal Reserve System 2000). While this is a rousing testament to the efficacy of credit allocation, it could be argued that the focus on single-family

houses has contributed to environmental degradation by promoting suburban sprawl and increased reliance on the automobile as opposed to public transportation. As recognition of the importance of environmental problems grows, it is appropriate to question the wisdom of continuing to make single-family housing the top priority for credit allocation while at the same time ignoring the needs of our "house in common," the environment.

Here we explore three policy alternatives that would build on traditional credit allocation techniques, redirecting them to serve environmental objectives. The first would operate at the national level, by providing long-term funding for environmental projects. The second and third would reallocate funding through the existing international financial institutions to support environmental projects and policies.

### *Creating a U.S. Environmental Finance Authority (EFA)*

The energy crisis in the 1970s prompted a series of discussions about the need to allocate credit for the production of non-oil energy (FRBB 1973; U.S. House 1975). Former Federal Reserve Board governor Sherman J. Maisel (1973) proposed an environmental finance authority, modeled on Fannie Mae and the Federal Home Loan Bank Board, to support loans originated by private lenders to develop alternative energy strategies. As reasonable as this proposal appeared to many at the time, and as prescient as it now seems in retrospect, it was lost in the growing ascendancy of "free market ideology" that shuns government intrusion in private market decisions (BIS 1995).

In 1994, however, a new development bank with environmental objectives was created in conjunction with passage of the North American Free Trade Agreement (NAFTA). This entity, the North American Development Bank (NADB), is authorized

to fund development on both sides of the U.S.-Mexican border and has a specific mandate to finance environmental infrastructure on the Mexican side. So far, its performance has been disappointing, but the bank's supporters have proposed reforms that would enhance its ability to function effectively.<sup>5</sup> Many environmental projects require a national focus, however, because of both their scope and the scale of financing required.

A more appropriate model for an environmental finance authority (EFA) is Fannie Mae: an agency with a national mandate to focus expertise on financing a targeted set of projects and concerns. Like Fannie Mae, an EFA could begin operations as a wholly public entity, whose stock is owned by the federal government rather than by private investors. Like other GSEs, it could be given limited authority to borrow from the Treasury, as well as authority to expand its funding by issuing its own securities. To ensure that funding is adequate to meet the needs of this new entity, one could tap yet another credit allocation technique: imposing a small supplementary reserve requirement on all U.S. financial institutions that can be satisfied by investing in the obligations of the EFA as well as by providing direct funding for environmental projects.

Public ownership would require that overall policy guidelines be set by Congress, a process that would generate meaningful debate on environmental issues. The EFA would allow for a mix of financing options to implement existing objectives, support new research, and respond to emerging problems. Such a mix might include loans, grants, interest-rate subsidies, tax credits, and guarantees for loans and securities originated by private lenders. The EFA could pool and securitize its own loans, tapping private investors both for its initial funding and to redistribute its portfolio. For example, the EFA could pool and securitize long-term loans to states and municipalities to clean up brownfields, to purchase land or conservation easements, and



to fund water and sewerage projects, significantly increasing the number and effectiveness of these efforts. Similar techniques—perhaps with the addition of interest rate subsidies or tax credits—could be used to promote such activities as *in situ* conservation of crop genetic diversity, sustainable forestry, and solar and other renewable energy projects.

The history of lending by GSEs to other priority sectors supports the view that the government needs to assume a leadership role to make adequate and innovative funding available for environmental objectives. It can be hoped that other countries also would establish EFAs with similar objectives. But unilateral action by the United States could make a very substantial contribution to improving not only the nation's environment but also the global environment.

### *International Financial Institution Lending Operations*

The World Bank and the regional development banks—the Inter-American Development Bank, the Asian Development Bank, the African Development Bank, and the European Bank for Reconstruction and Development—were created to allocate credit internationally, based on an explicit recognition that private credit markets cannot provide an adequate channel for financing investments that yield long-term payoffs or social returns not fully appropriable by the private investor.

Minimally, one might hope that these international financial institutions (IFIs) would not allocate credit for projects that exacerbate serious environmental problems. Yet in practice, even by this modest standard, the IFIs have often fallen short. All too often their lending has subsidized investment in fossil fuel-based power generation, tropical deforestation, pesticide-intensive agriculture, and other environmentally destructive activities. The result is a double subsidy: a financial subsidy in the form of publicly backed credit at below-market rates, on top of the “pollu-

tion subsidy" (Templet 1995) that is present whenever firms save money by passing the costs of pollution onto others, instead of internalizing the costs of pollution control.

One example is the unconscionable bias of World Bank energy-sector lending in favor of fossil fuels. In the six years following the 1992 Earth Summit, the Bank spent twenty-five times more on fossil-fuel energy projects than on renewable energy projects (Institute for Policy Studies 1998). The Bank has invested a small fraction of its funds—with disproportionate publicity—in renewable energy projects, including a recent \$100 million loan to China (Friends of the Earth et al. 2000). Through the Global Environmental Facility (GEF), implemented jointly with the United Nations Development Programme and the United Nations Environment Programme, the Bank has helped to establish a global equity fund called the Renewable Energy and Energy Efficiency Fund, and a Solar Development Group that seeks to stimulate the market for photovoltaic technology in developing countries (World Bank 2000b). These efforts have been dwarfed, however, by more than \$15 billion in World Bank lending for oil, gas, and coal projects in the past decade.

A more ambitious—but not unreasonable—hope would be that IFI credit allocation would not only do no harm, but actually do some good, by positively advancing environmental goals. For example, if the majority of the energy-sector lending by the World Bank and the regional development banks were redirected into solar, wind, and other renewable energy investments, it would do much to foster the technological innovations and scale economies needed to reorient global energy development toward a sustainable path. Yet a proposal to earmark even 20 percent for clean and renewable energy was cut from the final version of the World Bank's 1999 Energy and Environment Strategy (Friends of the Earth et al. 2000).

A further avenue by which the IFIs could positively advance

environmental aims would be to support the establishment of EFAs, along the lines suggested above, in borrower countries. These national institutions could provide a vehicle to support a variety of environmentally beneficial investments, including small-scale activities in agriculture, forestry, and other sectors.

### *Green Conditionality*

International credit allocation can also advance environmental goals by impacting domestic environmental policies. Access to international credit on favorable terms invariably requires borrowers to accept certain conditions set by the creditors. Historically, these conditions have ranged from favorable treatment for foreign investors to the adoption of neoliberal economic reforms to (in rarer cases) more vigorous efforts to reduce poverty. By framing conditions to require borrowers to adopt domestic policies that address environmental goals, international allocation of publicly backed credit could alter the constraints and incentives facing domestic policy-makers, much as domestic policy-makers can alter the constraints and incentives facing private-sector creditors.

The typical conditions attached to loans from the IFIs and bilateral aid agencies—macroeconomic stabilization, structural adjustment, and trade liberalization—have, at best, had mixed impacts on the environment (Reed 1996). In a candid internal review of its forestry strategy, for example, the World Bank (2000a, 13) observes: “The Bank does not require environmental impact assessment of structural adjustment loans. . . . Yet policies associated with economic crisis and adjustment—such as devaluations, export incentives, and removal of price controls—tend to boost production of tradable goods, including agricultural and forestry products. In doing so, and without mitigatory measures, they encourage forest conversion. Further, constrained fiscal situations may lead to reduced public spending on envi-

ronmental protection and weaken the capacity of forest ministries to enforce laws and regulations.”

In the 1990s, “second-generation” conditionalities—seeking to advance new objectives such as good governance, democratization, and the protection of human rights—began to be implemented by some donors. In a similar fashion, “green conditionality” could be used to advance environmental goals. Just as national-level credit allocation includes not only public-sector lending but also policies that shape the rules and incentives for private lenders, so international credit allocation can help to shape the rules and incentives for national governments. International lenders could encourage borrower governments to deploy a range of policy instruments—regulations, market-based incentives, and domestic credit allocation—to protect the environment.

This can be done either through *ex-ante* conditionality—providing credit to borrowers who agree to implement policy reforms—or through *ex post* conditionality (or “selectivity”), preferentially channeling credit to those governments that have good environmental records, and hoping that the “demonstration effect” will induce others to follow suit. In either case, two preconditions must be met if environmental conditionality is to be effective. First, there must be a domestic constituency for the environmental policies within the borrower country. Conditionality can help to strengthen the hand of those seeking environmental policy reforms, but only if there is already a hand to be strengthened. Second, there must be a credible commitment to sound environmental policies in the creditor institutions and the creditor countries themselves.

In a recent review of the few instances in which the World Bank has used conditionality in an effort to bring about reforms in forestry policy, Seymour and Dubash (2000, 2) report that the Bank was able “to catalyze key forest policy changes” when, as in Papua New Guinea, it allied with progressive reformers in the government to oppose the vested interests, including foreign com-

panies, that profited from rapacious logging. The authors conclude, however, that such "limited successes are counterbalanced by significant failures and omissions," which they attribute in part to wavering commitment within the Bank itself.

It is not enough for conditions to be attached to a loan: Words on paper must be matched by actions on the ground. This has not always been the case. In the Brazilian Amazon, for example, the World Bank conditioned loans for road construction and infrastructure development on various environmental safeguards, including the creation of biological reserves and the restriction of agriculture to suitable soils, but these conditions were then not met (Repetto and Gillis 1988, 34).

The credibility and legitimacy of green conditionality will be seriously undermined as long as the creditor nations themselves fail to put their own environmental houses in order. In sheer quantitative terms, domestic policies within the advanced industrialized countries are the single most important avenue to address global environmental degradation, and will remain so as long as these countries account for the bulk of the world's production and consumption. The countries whose average incomes place them in the richest one-fifth of the world's population today account for more than two-thirds of world income, while the countries whose average incomes place them in the poorest fifth account for only 1 percent (United Nations Development Programme 1992, 36). Whether the amount of environmental degradation generated by a dollar's worth of economic activity is higher in the poor countries than in the rich countries is an open question, but if we assume that the degradation per dollar is roughly comparable in both sets of countries, then the richest account for approximately seventy times more environmental damage than the poorest. Put differently, the amount of environmental degradation driven by the activities of the poorest countries could approach that driven by the richest *only if their degradation per dol-*

*lar were seventy times higher*—a thoroughly implausible figure.

In this context of extreme international income inequality, the domestic policies of the richest countries therefore will continue to have enormous weight in worldwide environmental quality. Developing countries will naturally, and justifiably, be reluctant to shift to renewable energy sources or to adopt other policies to safeguard the global environment as long as economic activities in the creditor countries continue to drive the lion's share of global environmental degradation.

## **Conclusions**

The allocation of credit is nowhere left entirely to private capital markets, for good reasons. Financial markets work well when investments generate cash flows over fairly short-term horizons. Investments that yield long-term returns, and investments that yield significant benefits to others but only small cash flows to the investor, are chronically underfunded by private capital markets.

For these reasons, national governments and international institutions play important roles in allocating credit throughout the world. They do so not only by lending public monies, but also by shaping the regulatory and incentive structures facing private lenders. To date, however, this policy instrument has not been systematically used on behalf of environmental goals.

The main instruments of environmental policy have instead been regulations and, more recently, the creation of market-based incentives designed to internalize environmental impacts in private decision-making. Important and useful as these real-sector policies are, they could be strengthened by the use of complementary financial-sector policies. Credit allocation can serve as a third leg in the stool on which environmental policy sits.

We have offered several examples of how this could be done. Of course, we are well aware that there is no guarantee that in-

terventions by governments or international institutions necessarily will advance public well-being. History provides ample evidence that they can do the opposite, benefiting politically powerful individuals and groups at the expense of the society at large. Credit allocation and environmental protection are not immune to this risk. Yet at the same time, these tasks cannot safely be left to private markets. The best way to ensure that public policies genuinely serve the public interest is to ground them in transparent, accountable, and democratic decision-making processes.

## Notes

1. Following Hardin (1968), this phenomenon is often called the “tragedy of the commons.” More precisely, it can be called the “tragedy of open access,” to distinguish it from the formal and informal common-property management institutions that have sustainably managed natural resources in many parts of the world. For a contrast between open-access and common-property fisheries, see Tierney (2000); more generally, see Ostrom (1990).

2. For discussions of this genetic erosion, see Boyce (1996) and Brush (2002).

3. See Torras and Boyce (1998). Similarly, in a study of the fifty states, Boyce et al. (1999) find that states with a more equitable distribution of power—as measured by an index based on voter participation, tax fairness, Medicaid access, and educational attainment—tend to have stronger environmental policies and better environmental quality.

4. See, for example, Rich (1994) on the environmental impacts of World Bank lending; Cohn (1997) on the role of the U.S. government in the development of the nuclear power industry; and Rich (2000) on the environmental impacts of U.S. and European export credit agencies.

5. Since its establishment, NADB lending has been limited. The range of sectors (water, wastewater, and sewerage) is narrow, the commercial terms imposed on borrowers (fifteen-year maturities and 25–27 percent interest rates) are quite inappropriate, and the geographic limits (100 kilometers on either side of the border) inhibit the bank’s ability to fund needed projects. Proposals to expand its powers and to provide interest-rate subsidies are favored by the U.S. State Department and the Environmental Protection Agency, but opposed by the Treasury (Alden 2000).

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