Edited by
Anwar Shah

Taxing Choices for Managing Natural Resources, the Environment, and Global Climate Change

Fiscal Systems Reform Perspectives

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The editor is pleased to dedicate this book to the following scholars who inspired his research interests in fiscal system reform options managing natural resources, local environmental protection and global climate change.

Professor Robin Boadway, Queen's University, Canada, inspired his work on fiscal federalism dimensions of natural resource management, environmental protection, and global climate change.

Professor Melville McMillan of the University of Alberta, Canada, introduced him to public finance of the environment and natural resource management.

Professor Lawrence Summers, Harvard University, motivated his work on carbon taxes and removing energy subsidies as tools for fiscal system reforms. He convincingly argued in 1980s that such policies make eminent economic sense even in the unlikely event that "global warming turned out to be the swine flu epidemic of the 1960s".

Professor John Whalley, University of Western Ontario, Canada introduced him to the economics of global climate change in the 1980s and was the principal advisor in the editor's advocacy to the World Bank to undertake a major research project on economic instruments to combat global climate change.

About This Book

This book presents fiscal system reform perspectives to protect the local and global environment and preserve and sustain natural resources. Strategies and practices to manage and sharing of revenues from natural resources are highlighted. Alternative economic instruments such as carbon taxes, elimination of energy subsidies, and tradable permits to combat global climate change are examined. In addition, the roles of various orders of government in managing, taxing, and sharing natural resources in selected federal countries are documented to highlight the impact of such division of responsibilities in preserving natural resources and the environment. Finally, reform options to achieve integrity in oil and gas operations are highlighted.

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Notes on Contributors

Robin Boadway is Emeritus Professor of Economics at Queen's University, Canada. He is past Editor of the *Journal of Public Economics* and *Canadian Journal of Economics* and past President of the International Institute of Public Finance and of the Canadian Economics Association. He was Distinguished Fellow of the Centre for Economic Studies at the University of Munich. He is an Officer of the Order of Canada and a Fellow of the Royal Society of Canada.

Neil Bruce (now deceased) was Professor Emeritus, University of Washington Victoria. He previously held faculty positions at Queen's University, the University of Colorado. He published widely on taxation, public goods, social security, and welfare in a broad range of professional journals and books. Much of his work was with his distinguished colleagues such as Robin Boadway, Michael Waldman, Richard Harris, Robert Halvorsen, and Stephen Turnovsky, appearing in the most prestigious journals such as *The American Economic Review*, *Quarterly Journal of Economics*, *Journal of Public Economics*, and *Journal of Political Economy*. His book and monograph publications included his widely adopted book, coauthored with Robin Boadway, *Welfare Economics* (Blackwell, New York, 1984) and more recently *Public Finance and the American Economy* (Boston: Addison-Wesley, 1998, 2002), which considers the government's role in a market economy. Among his professional associations and service, Neil served as a member of the Washington State Governor's Council of Economic Advisors, the Prosperity Partnership Steering Committee on

Tax Reform, the Washington State Tax Structure Study Committee, and the American Economic Association and the National Tax Association.

Gregory Ellis (now deceased) was Principal Teaching Professor at the University of Washington. He received his Ph.D. in 1992 from the University of California, Berkeley, with a dissertation entitled, "Environmental Regulation with Incomplete Information and Imperfect Monitoring." He received the Buechel Award for Distinguished Undergraduate Teaching in Economics in 2004 and again in 2013. In addition, he received the Buechel Award for Outstanding Contribution to the Economics Undergraduate Program in 2008. He has widely published on natural resources and environmental economics issues.

Frank Flatters is Professor Emeritus of Economics at Queen's University, Canada. His academic work centered on aspects of applied welfare economics including international trade, fiscal decentralization, cost-benefit analysis, and corruption. Following early retirement from Queen's, he worked as a policy economist—as a researcher, advisor, commentator, and mentor. He has provided policy advice to a number of countries in Asia and Africa on a variety of issues, including the design, evaluation and reform of trade, regulatory, fiscal, and industrial policies. He has published widely on fiscal federalism, tax reform, tax incentives, natural resources management, trade, and regulatory policy issues. His contributions to these fields have been widely quoted and reprinted.

Jorge Jatobá is currently a partner in the Consulting and Economic Planning (CEPLAN), Brazil. He previously retired as Professor in Economics at the UFPE, Brazil. He received his Ph.D. in Economics from Vanderbilt University (USA) and Post-Doctorate in Labor Economics and Industrial Relations at the University of Wisconsin-Madison. He also was a Visiting Scholar in the Department of Economics at UFPE Economic Growth Center, Yale University, and Visiting Professor at Brown University. He coordinated Getúlio Vargas Foundation Regional office in the Northeast, Brazil. He also previously served as the Secretary for Employment and Wages of the Ministry of Labor; Head of the Special Advisory Office of the Ministry of Labor and Secretary of Finance of Pernambuco; Consultant for the International Labor Organization (ILO), World Bank (IBRD), Inter-American Development Bank (IDB), Economic Commission for Latin America and the Caribbean (ECLAC), Federal and State

Governments, and for the private sector organizations in Brazil. He has published several works in Brazil and abroad.

Bjorn Larsen is an environmental economist and consultant to the World Bank, governments, and research institutions. His areas of research and interests have over the last decades been economic assessment and cost-benefit analysis of environmental health issues including household air pollution, ambient air pollution, water-sanitation-hygiene, and lead and arsenic exposure. He has received worldwide recognition for his work on local and global environmental issues. In early 1990s, he, in collaboration with his colleague Anwar Shah at the World Bank, did pioneering work on global climate change issues including quantifying the impact of carbon taxes and energy pricing reform options on tax reform, economic welfare, health costs, and local pollution and global carbon emissions for developing countries.

Angie Nga Le is a visiting postdoctoral associate in the Department of Public Policy and Administration, Steven J. Green School of International and Public Affairs, Florida International University (FIU). Her research interest focuses on public administration, public policy, and public finance. She previously served as a researcher for the Vietnamese Government's Ministry of Planning and Investment. She assisted the International Labor Organization's research team in developing Vietnam's National Employment Strategy and was actively involved in the Vietnam National Assembly's project on public budgetary and financial supervision. She received her Ph.D. degree in Public Affairs from FIU and masters degrees from the KDI School of Public Policy and Management (in development policy) and Université Libre de Bruxelles (in public management and economics).

Baoyun Qiao is Professor of Economics, China Academy of Public Finance and Policy, Central University of Finance and Economics. His research has mainly focused on public finance, macroeconomics, development economics, and china economy. He is an author of more than a dozen books. He published numerous scholarly papers in leading economic journals. He has advised many countries such as China and Thailand on public finance, fiscal decentralization, taxation, budget management, subnational debt management, local governance, and economic development. He has directed research projects on China Public Finance Reform, China Green Taxes, China Subnational Debt

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Anwar Shah is a Non-resident Senior Fellow, Brookings Institution, Washington, DC, USA, and a Fellow, Institute of Public Economics, Edmonton, Canada. He has previously served as the Director, Centre for Public Economics, SWUFE, Chengdu/Wenjiang, China, and also the World Bank, Asian Development Bank, Canadian Ministry of Finance, the Government of Alberta Urban Advisory Group, and the UN Intergovernmental Panel on Climate Change. He has published more than two dozen books and numerous articles in leading journals. His books include *Fiscal Federalism* (with Robin Boadway), by the Cambridge University Press, and *Local Public Finance and Economics* (with Harry Kitchen and Melville McMillan); *Local Public, Fiscal and Financial Governance* (with Brian Drollery, Harry Kitchen and Melville McMillan) by Palgrave McMillan/Springer Nature Press and *Fiscal Incentives for Investment and Innovation* by Oxford University Press.

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PART I

Introduction and Overview

CHAPTER 1

Overview

Anwar Shah

This book presents fiscal system reform perspectives to protect the local and global environment and preserve and sustain natural resources. Strategies and practices to manage and sharing of revenues from natural resources are highlighted. Alternative economic instruments such as carbon taxes, elimination of energy subsidies, and tradable permits to combat global climate change are examined. In addition, the roles of various orders of government in managing, taxing, and sharing natural resources in selected federal countries are documented to highlight the impact of such division of responsibilities in preserving natural resources and the environment. Finally, reform options to achieve integrity in oil and gas operations are highlighted.

The book is organized into five parts. Part I provides an introductory overview of the book. Part II is concerned with the taxation of natural resources and the environment and revenue sharing and issues in the design and management of non-renewable resource revenue funds.

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Part III deals with environmental federalism and reviews the experiences of OECD countries and Brazil. Part IV is devoted to combating global climate change. This part discusses the potential role of carbon taxes and the elimination of energy subsidies in mitigating the greenhouse effect. Part V analyzes the susceptibility of extractive industries to grand corruption and why international efforts to combat corruption to date have been ineffective.

The following paragraphs provide an introduction to various chapters in this book.

Chapter 2 by Boadway and Flatters presents principles of taxation of natural resources and policy issues that arise in practice in applying these principles. Natural resources are typically subject both to taxation under the income tax system and to special resource taxes. Properly designed income taxes attempt to include capital income on a uniform basis. But in most countries, the income tax treats resource industries more favorably than most other industries—through favorable treatment of such capital expenses as depletion, exploration and development, and the cost of acquiring resource properties.

The case for special resource taxes is precisely to tax resource rents over and above the levies implicit in general income taxes. There are two justifications for this: (1) the efficiency-based argument that a tax on resource rents is non-distorting and complementary, and (2) the "equity" argument that the property rights to resources ought to accrue to the public at large rather than to private citizens since the rents represent the bounty nature has bestowed on the economy rather than a reward for economic effort.

If the main purpose of a resource tax is to capture rents for the public sector, the base of resource taxes should be economic rents (or their present value equivalent), contend Boadway and Flatters.

Actual resource taxes differ from rent taxes in significant ways. Unlike a general income tax—which allows the resource industries to understate capital income—resource taxes often overstate rents. This is because they typically do not offer full deductions for all costs, especially capital costs. Some systems tax revenues without allowing any deductions for costs; others allow the deduction of current costs only. As a result, they discourage investment activity in resource industries, encourage the exploitation of high-grade relative to low-grade resources, and make it difficult to impose high tax rates for fear of making the marginal tax rate higher than 100%.

Boadway and Flatters (Chapter 2) discuss three alternative "ideal" ways for the government to divert a share of rents to the public sector:

- Levy a tax on rents, ideally in the form of a cash flow tax.
- Require firms to bid for the rights to exploit resources.
- Take a share of equity in the firm.

They discuss these options in terms of their implications for the ability of firms to obtain finance, the allocation of risk, the share of rents accruing to the public sector, the extent of involvement of foreign firms, and other factors. The time has come in many countries, they say, when gains from a further refinement of imperfect existing taxes on resources arc less than replacing them with simpler, more efficient forms of pure rent taxes.

Neil Bruce and Gregory Ellis, in Chapter 3, review green taxes and policies for environmental protection. They state that increasing urbanization and industrialization can exacerbate pollution problems in developing countries. Tax revenues in developing countries are too low to support adequate infrastructure for treating and disposing of waste. Still, the problem is also attributable to the classic problem of externalities in production and consumption. "Externalities" means that the costs of environmental degradation are not considered by the private decision-makers undertaking the activities that cause the problems.

Two types of policies are commonly considered to correct this market failure and improve the allocation of resources: *command and control policies* (such as emission and abatement standards) and *market-based incentives policies* (such as emissions charges, taxes on production and consumption, and marketable pollution quotas), which raise the price of such activities for the perpetrators.

Market-based incentives theoretically reduce pollution at the least cost and increase government revenues but may require costly monitoring to be effective and are usually implemented in an environment of imperfect information about the costs of abatement. Sometimes command and control policies make more economic sense in this environment.

Efficiency gains from curbing pollution in developing countries may be large. Some polluting activities are subsidized, so curtailing them brings both fiscal and environmental benefits. Taxing polluting inputs and outputs is a particularly attractive policy in developing countries, which

often lack experience in administering and enforcing other types of environmental regulation. Corrective taxes make use of existing administrative structures and increase tax revenues, which can be spent on public goods to improve environmental quality (including treatment facilities for water and sewage, waste disposal, and sanitation) or can be used to reduce other taxes (which are often highly distortionary in countries with a narrow tax base).

Which goods and inputs to single out for corrective taxation depends on the main sources of pollution, which varies from country to country. Air pollution from vehicles is growing in many countries, where increased fuel taxes, perhaps coupled with improved regulations for vehicle maintenance, may be desirable. Higher taxes on high-sulfur coal would curb both industrial and household emissions of sulfur dioxide. Charges can be implemented for fixed site, easy-to-monitor industrial emissions. Subsidies to industries that cause pollution should be phased out, and those industries should be subjected to higher-than-average tax rates.

Qiao and Shah (Chapter 4) are concerned with sharing of natural resource revenues. Natural resource revenues, especially non-renewable resource revenues, present special challenges for resource management and sharing of revenues due to special features. These revenues are highly unevenly distributed and subject to uncertainty, instability, and volatility associated with large fluctuations in prices and demand. These shocks are often persistent. The uneven distribution and exhaustible nature of resources—depletion of wealth over time—have serious implications for fiscal sustainability, interjurisdictional, and intergenerational equity. Resource-rich countries also face Dutch disease with exchange rate appreciation, resulting in a lack of competitiveness of exports and an adverse impact on the industrial base and economic growth. Empirical evidence shows a negative relationship between resource revenue dependence and economic growth. Resource management and exploitation represent a complex value chain with a high probability of corruption being undetected and, when detected, even more, difficult to prosecute, and significant increases in revenues invite rent-seeking behaviors. Overall, resource-rich countries have a high incidence of corruption. Beyond these unique features, division of responsibilities for resource ownership, management, and sharing of revenues in a multi-order government represent special challenges, and what is conceptual ideal or desirable is typical, not feasible. Ideally, citizens at large and not any order of government should have resource ownership, and all net oil and gas revenues

are deposited in a non-renewable resource revenue fund, i.e., a heritage fund (Norwegian style) owned by all citizens regardless of their place of residence. The assets of this fund are held in perpetuity and could not be drawn, but capital income would be available for current use. In multi-order governance, competing and conflicting goals stand in the way of ideal solutions. Political cohesion and environmental protection considerations require preferential access to resource revenues in producing regions. Economic and social union considerations require national sharing of resource wealth. Only second-best solutions may be feasible in these countries. Such solutions should aim to limit adverse incentives.

Qiao and Shah (Chapter 4) show that in practice, even the second-best solutions are not politically feasible, and instead, a plethora of compromise solutions have been followed. A second-best solution is the centralization of resource rent taxes and redistribution through a federal fiscal equalization program. Alternately, decentralization of resource rent taxes accompanied by an inter-state (net) equalization program may be desirable.

Chapter 5 by Shah provides an overview of the principles and practices of non-renewable resource revenue funds. It notes the unique features of non-renewable resource revenues that motivate the establishment of these funds. These special features include the uncertainty, instability, and volatility of resource revenues, exhaustible nature of resources, vulnerability to Dutch disease, and complex value chain with a high probability of corruption being undetected. The author presents examples of large funds with the size of their assets and ratings on transparency of governance. He highlights the principal objectives of these funds. These objectives vary from economic stabilization to financing infrastructure and facilitating economic development. Norway and the State of Alaska USA share a unique goal of using these funds as a tool for common citizenship. On the effectiveness of these funds, empirical evidence is mixed in achieving economic stabilization, fiscal discipline, overcoming Dutch disease, and good governance objectives but quite positive in furthering common citizenship, wealth accumulation, intergenerational equity, and province-building goals. The author notes key considerations in significant elements of fund design-governance, transparency and oversight, rules on a total pool, and inflows and outflows.

Fund governance must be based on a legal framework with parliamentary oversight and cabinet accountability for legislative compliance.

Overall management responsibility may rest with the finance minister or treasurer with clearly specified rules on inflows and outflows, asset allocation, the threshold for risk tolerance, reporting and transparency requirements, ethics rules, and choice of internal or external management. Agency or ministry for operational management must be identified, and institutional mechanisms for operational oversight should be laid out. Various asset management options need to be carefully evaluated, and transparency and civil society oversight arrangements are elaborated. Various inflow rules are evaluated, and a choice of appropriate inflow rule is made. Similarly, outflow rules also must be critically examined to select the most appropriate rule to suit local preferences. Finally, the author draws the following lessons from the practice of non-renewable resource revenue funds (NRRFs).

- NRRFs are important tools to advance stabilization, economic diversification, wealth accumulation, common citizenship, and regional development goals.
- External contractual fund management with an independent oversight board may help maximize returns while keeping risks within tolerable limits, provided overall management responsibility and policy determination rest with the government.
- Accountable fund governance is critical to NRRFs success. Transparency, integration with the budget, and parliamentary and civil society oversight advances responsible and accountable governance.
- Citizens' right to know and access to information and external audit is critical for restraining direct or indirect raiding of funds from advancing political and bureaucratic interests.

Chapter 6 by Shah is concerned with drawing lessons from OECD experiences with environmental federalism. The chapter presents a synthesis of conceptual underpinnings in the assignment of environmental functions from the literature on federalism, public choice, political science, and neo-institutional economics. It offers a comparative perspective on environmental federalism practices in Australia, Canada, Germany, the USA, and the European Union. It concludes with the following lessons from the experiences of these mature federations.

- Cooperative or even competitive federalism is better approach to environmental management. Command and control approaches are costly and proven ineffective. Federalism principles are a valuable guide to practice. Applying "one-size-fits-all" approaches to local environmental quality leads to costly administration and jurisdictional conflict. For example, US Federal Arsenic Rule for Drinking Water, 2001, provided uniform standards that were shown to be costly and difficult to comply with by small local jurisdictions. Federal spending power could be used to have national minimum (possibly variable with for type and size of jurisdiction) standards, but unfunded mandates must be avoided.
- Decentralized governance for local environmental functions does not lead to a "race to the bottom." It may enhance economic efficiency and environmental quality through jurisdictional competition and innovation (e.g., through emission trading at the state level in the USA). Local governments typically link environmental quality with economic development, and therefore, it may lead to "a race to the top," as indicated by the experience of OECD countries. Subnational agreements may prove a less costly alternative to centralization for some cross-border externalities.
- Democratic participation ensures safeguards for environmental protection. Civil society groups help in ensuring compliance.
- Environmental federalism represents a dynamic influence of complex interactions of societal consensus and government commitment to environmental protection, constitutional-legal framework, political system, party competition, institutions of intergovernmental relations, judicial system and traditions, public interest groups, bill of rights including protection of property and international agreements and influences. Any effort to reform this system must pay attention to all these elements.

Chapter 7 by Jatobá reviews environmental federalism in Brazil—a large federal country.

The author argues that while the Brazilian Constitution has a strong emphasis on environmental protection, it does not delineate a clear division of responsibility for environmental functions among various orders of government. This lack of clarity contributes to intergovernmental conflicts and impairs the efficiency and efficacy of environmental policies. To overcome this, Brazil, in recent years, has made substantial progress in

institutionalizing environmental policy and clarifying the roles of various orders/levels of government. In addition, the conception of environmental policy and the exercise of many of its instruments are democratic. In fact, there are environmental councils at all levels of government. In these councils, civil society is widely represented. As a result, environmental awareness is increasing in the country, keeping pace with the dynamism of the Brazilian environmental movement and with the maturing of environmental government institutions.

Access to environmental information and environmental statistics is easy and widespread, and the legal system is well positioned to punish environmental crimes. Further, the State and Federal Public Prosecutor's Offices have been keen observers of unlawful environmental practices and very attentive to any threats to environmental quality. Despite all this, the country faces severe environmental problems as illegal deforestation, water, soil, and air pollution, desertification, and other environmental plagues strike all regions. The contradiction posed by the institutional advances and the severity of the environmental problems is explained by the coordination failures across various orders of government in Brazil. There have been concerted efforts in recent years to overcome these failures.

The author notes that the creation of the National and State Tripartite Commissions, as well as the efforts that are being made to enact legislation that clarifies institutional assignments for the conception and implementation of environmental policies and programs, shows that governments and society at large are trying to mitigate federative conflicts that lead to waste of resources, loss of welfare, and inefficiency and inefficacy in the implementation of policies designed to better the environment and to promote sustainable development.

The author notes that the Brazilian environmental system is also vulnerable to fraud and corruption. Substantial economic interests are at stake because of the richness of the Brazilian natural resources. Reconciling economic interests with environmental protection is at the heart of sustainable development. Brazil has an immense natural capital to preserve and use as productive resources for its development. Achieving sustainable, inclusive, and equitable development in harmony with the Brazilian natural endowment is a challenge that government and the environmental movement will face for many years ahead.

Larsen and Shah, in Chapter 8, evaluate the case for carbon taxes in terms of national interest. They reach the following conclusions:

- A global carbon tax involves issues of international resource transfers and would be difficult to administer and enforce. It is thus unlikely to be implemented soon.
- National carbon taxes can raise significant revenues cost-effectively in developing countries and are not likely to be as regressive in their impact as commonly perceived. Such taxes can also enhance economic efficiency if introduced as a revenue-neutral partial replacement for corporate income taxes or in cases where subsidies are prevalent. The welfare costs of carbon taxes generally vary directly with the existing level of energy taxes, so a carbon tax should be an instrument of choice for countries such as India and Indonesia, which have few or no energy taxes.
- A carbon tax can significantly reduce local pollution and carbon dioxide emissions. Cost-benefit analysis shows countries with few, or no energy taxes substantially gain from carbon taxes in terms of an improved local environment.
- A carbon tax of $10 a ton produces minimal output losses for selected countries' industries analyzed in this paper and the output losses are fully offset by health benefits from reduced emissions of local pollutants—even ignoring the global implications of a reduced greenhouse effect
- Tradable permits are preferable to carbon taxes where the critical threshold of the stock of carbon emission beyond which temperatures would rise exponentially is known. Given our current ignorance on the costs of reducing carbon emissions and the threshold effect, a carbon tax appears to be a better and more flexible instrument for avoiding high unexpected costs.

It has been argued that economic policies to protect local and global environments should, first and foremost, remove fossil fuel subsidies. Larsen and Shah in 1992 did pioneering work on specifying a framework and quantifying world energy subsidies for oil, natural gas, and coal and their impacts on carbon emissions and economic welfare. Larsen, Le, and Shah (Chapter 9) update and extend that work to also cover the electricity subsidies. Based on a sample of 87 countries, they estimate that in 2019, world energy (oil, gas, coal, and electricity) subsidies to be more than US$1.38 trillion. They note that despite renewed heightened interest in combating global climate change, world has made little progress to get

energy prices right over the last three decades and the use of energy subsidies worldwide has significantly increased over the past three decades.

Removal of these subsidies could reduce global carbon emissions by 15%, assuming no change in world fossil fuel prices, and by 9% when accounting for estimated changes in world prices. Welfare gains from subsidy removal worldwide would be more than US$172 billion assuming no change in world prices, even ignoring the benefits from curtailment of greenhouse gases emissions and abatement of local pollution. Total welfare gains from removing fossil fuel subsidies when accounting for world price changes would still be some US$148 billion in subsidizing countries. Net fossil fuel importers in Western Europe, United States, and Japan would experience a welfare gain of approximately US $30 billion in the event of subsidy removal dampening world energy prices. Equivalent reductions in carbon emissions could be achieved by an OECD carbon tax on the order of US$155–341 per ton. It should be noted that neither the subsidy removal nor an equivalent carbon tax would be sufficient to stabilize global carbon emissions at 2025 levels. To achieve that objective, stronger economic policy responses would be required.

Chapter 10 by Shah examines the grand corruption observed in oil and gas industries and discusses its root causes conceptually and empirically based upon unique features of the oil and gas industry. The oil and gas industry has a complex value chain with a high probability of corruption being undetected. Further, in dealing with corruption in resource-rich developing countries, the Western countries' strategic, security, economic, and commercial interests collide with their moral compass. This process safeguards the interests of dictatorial ruling elites in developing countries. As a result, grand corruption persists, benefits from oil and gas exploration accrue to a small group of ruling elites, and the public is deprived of opportunities for economic and social advancement. The global initiative, the so-called Extractive Industries Transparency Initiative, was undertaken to ensure transparency of payments given and received. This initiative is a welcome first small step but unlikely to significantly impact combating corruption. This is because it covers a small number of countries and a small coverage of the value chain and does not include bribe payers as members. The author argues that a more effective anti-corruption regime would provide victims' compensation, full transparency of all transactions in the oil and gas sector, and empowerment of citizens to sue their governments for non-compliance with full transparency provisions.

Shah concludes that combating corruption in the oil and gas sector is one of the most challenging tasks facing reformers worldwide. Given the enormous complexity of the underlying transactions, uncovering corruption is an enormously difficult even in the most ideal public policy environment. To assist in this effort, creating an enabling environment for people's right to know and freedom for investigative journalism to pursue all leads without fear of harassment, persecution and risks to life and liberty should be the first order of priority for policymakers. A second order of priority is to establish an authorizing environment that holds powerful individuals and entities to account for corrupt practices through timely and fair dispensation of justice. This would require difficult legislative and judicial reforms. Since corruption in the oil and gas sector, in a large part, originates from the stakeholders in industrial countries, it would also require strong judicial interventions by these countries along the lines of the US Foreign Corrupt Practices Act. International advocacy groups concerned with corruption in the oil and gas sector would be well advised to focus their activities on both the open government issues in resource-rich countries as well as creating disincentives for stakeholders in bribe-paying countries to disengage them from corrupt practices to advance their economic and political agendas.

PART II

The Taxation of Natural Resources and the Environment, Revenue Sharing and Revenue Fund Management

CHAPTER 2

The Taxation of Natural Resources: Principles and Policy Issues

Robin Boadway and Frank Flatters

2.1 Introduction

The raising of revenues from the economic activity associated with the exploitation of natural resources is virtually a universal phenomenon among the nations of the world. This can take several different forms. It may consist of taxes specific to the resources in question. It may involve special measures applicable selectively to the resource industries within more general systems of taxation (such as the corporation income tax). Or, it may consist of varying degrees of public ownership of resource property rights ranging from ownership of the resource being exploited which are sold or leased to private sector resource firms, to joint public-private ventures, to outright public ownership and operation of the resource firms themselves. Our purpose in this study is to concentrate on the use of taxation measures by the public sector to extract revenues

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