

Effects of natural resource revenue sharing and investment arrangements on economic growth and poverty reduction in low- and middle-income countries

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PROTOCOL

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Contents

1. Background	4
1.1 Aims and rationale for review	4
1.2 Policy background	4
1.3 Definition and measurement of key concepts.....	6
1.4 Research background	10
1.5 Conceptual framework	11
1.6 Objectives of review	18
1.7 Review approach	18
2. Methods used in the review	21
2.1 User involvement.....	21
2.2 Identifying and describing studies	23
2.3 Assessing quality of studies	25
2.4 Synthesis of findings from studies included	25
2.5 Quality assurance.....	26
References	27
Appendices.....	31
Appendix 1.1: Authorship of this review.....	31
Appendix 1.2: List of low- and middle-income countries	32
Appendix 2.1: Search strategy for electronic databases	34

List of abbreviations

CCT	Conditional cash transfer
CGE	Computable general equilibrium model
DCT	Direct cash transfer
GDP	Gross domestic product
HDI	Human development index
LMIC	Low- and medium income countries
MPI	Multidimensional poverty index
PDS	Public distribution system
PIP	Public investment projects
SWF	Sovereign wealth fund
WGI	Worldwide governance indicators

1. Background

This chapter describes the background to the current systematic review. It begins with a brief statement of the aims of the review and the rationale for undertaking it. This is followed by a discussion of the policy background, including a brief introduction to the three revenue sharing and investment arrangements being reviewed, namely public investment projects (PIPs), sovereign wealth funds (SWFs), and direct cash transfers (DCTs).

Definitions and measurement issues relating to these as well as other key concepts are then presented. This leads naturally to an overview of the research background and a description of the conceptual framework encompassing all three arrangements, including a matrix illustrating our preliminary typology of the contexts and channels through which these arrangements affect the outcome variables of interest.

The chapter concludes with a statement of the specific objectives of the review, and our general approach to the reviewing process.

It is worth noting at the outset that, in many ways, this systematic review can be thought of as comprising *three* separate (although related) reviews, each focusing on one of the above three arrangements. Further, there is as yet no standard, universally accepted theory of how these arrangements affect economic growth, poverty reduction, and other socio-economic performance variables. It is necessary, therefore, to discuss the proposed conceptual framework in rather greater detail in this review protocol than is usually the case.

1.1 Aims and rationale for review

The overall aim of this review, and of much research in this area, is to enhance understanding of how a society which is endowed with natural resources can manage them in order to achieve optimal outcomes in terms of living standards, poverty level, inter-personal and inter-regional disparities, social cohesion, and so on.

It has been observed that, in practice, many resource-rich countries have ended up performing more poorly in these regards than comparable countries, a situation often described in terms of a *resource curse*. Yet both theoretical reasoning and real-world examples suggest that natural resources need not be a curse always and may well be a blessing instead. It is highly appropriate, therefore, to undertake a review to systematise the prior expectations and evidence currently available with regard to some of the key options and relationships involved.

1.2 Policy background

Whether natural resources represent a blessing or a curse to developing countries has long been a matter of controversy. For a small sample of the relevant literature, see Gelb 1988; Sachs and Warner 1995; Sachs and Warner 2001; Auty 2001; Alexeev and Conrad 2009; Collier and Goderis 2009; Greasley and Madsen 2010; Cavalcanti, Mohaddes and Raissi 2011; and van der Ploeg 2011. Resource-rich countries tend to suffer from the adverse effects of the so-called Dutch disease, in particular real exchange rate appreciation due to increased resource-based exports, related difficulties faced by non-resource sectors of the economy and deindustrialisation. Attempts by officials and various groups in society to grab the resource rent for themselves can readily lead to corruption, greater inequality,

weaker institutions, higher risk of civil war, and lower stocks of human and public physical capital. It is not surprising, therefore, that countries such as Angola, Equatorial Guinea, Nigeria, and Venezuela have not performed well in terms of socio-economic development despite their considerable endowments of natural resources.

Yet there are also examples of countries where natural resources have apparently helped rather than hindered economic growth and development: these include not only currently rich countries such as Australia, Canada, and Norway, but also middle-income countries such as Botswana, Chile, and Ghana. Thus some authors have argued that natural resources may be a blessing, or at least need not be a curse, if managed properly. For example, Arezki and van der Ploeg (2007) emphasize the role of trade policies and institutions in managing natural resources. Other researchers and policy analysts (e.g. Goldwyn 2002; Sandbu 2006; Gelb and Grasmann 2010) advocate the use of revenue sharing and investment arrangements to limit the adverse consequences, and to promote the benefits, of ownership of these resources.

Revenue sharing arrangements can refer to sharing between different levels of government (e.g. national and local governments) or sharing among individuals (which in principle includes sharing between different generations). A greater emphasis is placed upon the latter form of sharing in this systematic review.

Of the many possible forms of revenue sharing and investment arrangements, three have attracted prominence over the years:

- Public investment projects (PIPs) - This term covers a wide range of public projects. This review focuses mainly on physical PIPs funded by resource revenue;
- Sovereign wealth funds (SWFs) - A SWF is a state-owned fund that invests with a long-term perspective; and
- Direct cash transfers (DCTs) - These transfers provide money directly to targeted households or individuals, conditional upon their fulfilment of certain requirements (e.g. sending their children to school regularly).

From a socio-economic development perspective, the relative merits of the above arrangements can be measured in terms of a number of outcome dimensions, such as:

- economic growth;
- poverty reduction;
- governance quality and others.

Policymakers as well as members of the public in resource-rich countries would naturally have an interest in knowing whether it matters which (if any) of the above arrangements is adopted.

In this context, it should be noted that many authors in this field have emphasised the role of social capital, institutional strength, rule of law, transparency, and related factors. For example, van der Ploeg (2011) finds that the adverse consequences of natural resources tend to be most severe in countries with poor-quality institutions, weak rule of law, and corruption. Kolstad and Soreide (2009) also highlight the importance of preventing corruption, rent-seeking and patronage. Similarly, Mehlum, Moene, and Torvik (2006a, b) and Bhattacharyya and Hodler (2010a, b) explain differences in development outcomes largely by reference to differences in the quality of political and social institutions. In view of these findings, the approach in the present review will be to differentiate

between good and poor governance systems when analysing the effects of the various revenue sharing arrangements.

1.3 Definition and measurement of key concepts

This section provides a summary overview of key terms used in this systematic review. For each term, a formal definition and quantitative measures or indicators, whenever possible, will be provided. In addition, conceptual issues related to each term will also be briefly discussed. It should be noted that, in the existing literature, the exact definitions and measurements adopted by different authors may vary considerably. The definitions and measurements presented here have been chosen to be representative, and inclusion and exclusion criteria will be applied where necessary to ensure a reasonable degree of consistency across the studies included in the review.

Natural resources: Natural resources are materials that can be derived directly from the natural environment. They include both biotic resources (such as forestry, fossil fuels, etc.) and abiotic resources (such as land, minerals, etc.). For manageability, this review will focus mainly on the natural resources of oil, gas and minerals.¹ These resources constitute important, often indispensable, inputs in the production of goods and services. They tend to occur in small sporadic geographic areas, and are available in finite quantities and non-renewable.

Natural resource rich country: The relative importance of natural resources to a country can be measured in a number of ways. In practice, the alternative indicators tend to be highly correlated so that they may be taken as being approximately equivalent. For the purposes of this systematic review, a country is said to be rich in natural resources if any of the following conditions is fulfilled:

- Production (value added) of oil, gas and minerals exceeds 15% of GDP
- Investment in the oil, gas and minerals sectors exceeds 15% of domestic investment
- Export revenues from oil, gas and minerals exceeds 15% of total exports
- Revenues from oil, gas and minerals contribute more than 15% of the public sector's total revenue.

Natural resource boom: A resource boom is said to commence whenever a country first satisfies any of the above three conditions. The beginning of a resource boom corresponds to the beginning of the study period for that country.

Low- and middle-income countries: A country's income level is typically defined in terms of average income. A widely adopted measure of average income is gross national income (GNI) per capita, where GNI is the new terminology for gross national product (GNP). In this systematic review we adopt the World Bank's 2010 classification of countries by income (World Bank 2011a):

- Low income: GNI per capita US \$1,005 or less
- Lower middle-income: GNI per capita from US \$1,006 to US \$3,975
- Upper middle-income: GNI per capita from US \$3,976 to US \$12,275

The World Bank uses the Atlas conversion factor to reduce the impact of exchange rate fluctuations in cross-country comparison of national incomes. According to the

¹ If relevant primary studies are found in sufficient numbers, we will attempt to distinguish between oil and gas on one hand, and minerals on the other. An example of such studies is the one conducted by Bond and Malik (2009) who find differences between fossil fuels and non-fuel resources in terms of their impact on private and public investment.

above classification, of the 215 countries/economies² classified (all with populations of more than 30,000 in 2010), 35 were low-income countries, 46 lower-middle-income countries and 35 upper-middle-income countries. Appendix 1.2 presents a list of all these countries.

The intersection of resource rich countries and low- and middle-income countries constitute the set of countries under study in this review.

Economic growth: Economic growth can be alternatively defined as increases in a country's capability to produce goods and services, or as rises in its standard of living. The concept is typically measured by a summary, central tendency indicator such as the annual rate of growth in real GDP per capita. Other, alternative measures of economic growth tend to be highly correlated with this familiar indicator.

Economic growth performance: The proposed time frame in which to consider the economic growth performance of a country is a 20- to 30-year period. For example, a country's economic growth during the 20-30 years following the commencement of its resource boom and implementation of one of the above revenue sharing arrangements will be of particular interest to the review. Where possible, the economic growth performance of a country will be analysed in terms of comparisons with a group of similar countries.

Poverty: Poverty can be generally thought of as severe deprivation of access to goods and services caused by low income. Over the years the definition of poverty has been broadened in order to embrace new approaches to poverty. Some official definitions of poverty are as follows:

A person is considered poor if his or her consumption or income level falls below some minimum level necessary to meet basic needs (World Bank 2011b).

Poverty is a condition characterized by severe deprivation of basic human needs, including food, safe drinking water, sanitation facilities, health, shelter, education and information. It depends not only on income but also on access to social services (UN 1995, p. 41).

Poverty is pronounced deprivation in well-being, and comprises many dimensions. It includes low incomes and the inability to acquire the basic goods and services necessary for survival with dignity. Poverty also encompasses low levels of health and education, poor access to clean water and sanitation, inadequate physical security, lack of voice, and insufficient capacity and opportunity to better one's life (World Bank 2011c).

These alternative definitions of poverty lead to different measures such as food poverty, income poverty, multidimensional poverty index (MPI), etc which tend to be correlated, although not perfectly. **In this systematic review, our focus is on income poverty. In particular, we adopt two main measures of income poverty:**

- **World Bank's worldwide benchmark for extreme poverty: daily income of US\$ 1.25 per person in 2005 purchasing power parity terms (World Bank 2011b); and**
- **National poverty lines.**

The two measures are highly correlated as the new international poverty line of \$1.25 a day at 2005 prices is in fact the mean of the national poverty lines for the

² For convenience, in this document, "countries" will be taken to mean "countries/economies".

10-20 poorest countries of the world (World Bank 2011b). Where possible, **our preferred unit of analysis is the country** to be consistent with the analysis of economic growth; we recognise, however, that in some cases country-level evidence may not be directly available and may have to be obtained indirectly e.g. via inferences based on regional, group, household or even individual data.

Prior to the availability of MPI in 2010, some researchers have used the human development index (HDI) as a proxy for multi-dimensional poverty. Note, however, that HDI is a measure of central tendency of the entire population, while the poverty lines are typically used to calculate the *incidence* of poverty, that is, the proportion of the population living below the relevant poverty line.

The above definitions and measures are related to *absolute* poverty. By contrast, the concept of *relative* poverty allows for the possibility that the well being of an individual may depend not only on his or her own living standard, but also on the living standards of others: the concept takes account of, among other things, income inequality and envy. These considerations are of particular relevance in analysing the well being of people in different regions (e.g. the rural-urban gap) or between people in a community with considerable income disparities. For example, economic growth may result in a decrease in absolute poverty, yet relative poverty (between individuals or between regions) may stay the same or may even increase due to rising income inequality. We expect that, in this review, **we will need to restrict the analysis to absolute poverty.**

Poverty reduction: In this systematic review, poverty reduction refers to the decrease in the incidence of poverty using either of the two measures of absolute poverty specified above. The time frame for analysing poverty reduction is within five years of the commencement of a resource boom and implementation of a revenue sharing arrangement. Where possible, the poverty reduction performance of a country will be examined with reference to a group of similar countries.

Two further points in this connection deserve mention. First, poverty reduction performance is sensitive to the specification of the poverty threshold. It has been observed that it is relatively easy to break through the US\$ 1.25/day benchmark but much more difficult to break through the US\$ 2/day benchmark. Second, some of the poverty reduction achieved to date may not be sustainable in the longer term, as some people who managed to get above the line may slide back under it when faced with natural calamity or adverse economic conditions (such as high food prices in recent years).

Governance: Broad definitions of governance tend to be consistent but vague. A standard, concise definition of governance is “the traditions and institutions by which authority in a country is exercised” (Kaufmann, *et al.* 1999, p. 1). Two other well-cited, official definitions are as follows:

Governance is the manner in which power is exercised in the management of a country’s social and economic resources for development. Governance means the way those with power use that power (Asian Development Bank 2011).

Governance can be seen as the exercise of economic, political and administrative authority to manage a country’s affairs at all levels. It comprises the mechanisms, the processes, and institutions through which citizens and groups articulate their interest, their legal rights, meet their obligations and mediate their differences (United Nations Development Programme 1997, p. iv).

Good governance typically requires, or manifests itself through, a range of factors such as:

- established property rights and rule of law
- transparency
- control of corruption
- political stability and absence of violence
- voice and accountability
- democracy

Other dimensions of governance include government effectiveness, regulatory quality and structure of government (unitary versus formal or informal federal governments).

In this review we adopt the World Bank's Worldwide Governance Indicators (WGI) as measures of aggregate and individual governance (voice and accountability, political stability and absence of violence, government effectiveness, regulatory quality, rule of law and control of corruption) for the countries under study (World Bank 2011d).

Public investment projects (PIPs): Public investment refers to the use of public funds at any level of the government (local, provincial, central) to increase a country's capital stock and, therefore, its future productive capability. Public investment can be broadly interpreted to include both investment in human capital and investment in physical capital. Our main focus in this review is on public investments in physical infrastructure, such as roads, bridges, irrigation systems, airports and seaports, and long-lasting assets in the electricity, water, or telecommunications sectors.

Sovereign wealth funds (SWFs): These are state-owned institutions that use state funds (especially but not exclusively in foreign currencies) to pursue commercial profits and to maximise long term return. A distinction is sometimes made between formal SWFs (often with a private equity fund structure and at an arm's length from the government) and investments made directly by the central bank or the Finance Ministry. It has also been argued that SWFs should be distinguished from resource stabilisation funds and sovereign private equity fund. Resource stabilisation funds are mainly used to smooth out fluctuations in resource export revenue, to insulate the national economy from currency appreciation and (in some cases) to support commodity prices. Sovereign private equity funds tend to seek management stakes.

From the perspective of this review, the above distinctions are rather less important than the fact that all these institutions share a common, essential characteristic: they are mechanisms that allow state funds to be invested for commercial profits and, in principle, to be available for use and distribution in the longer term. In that sense, it does not matter very much to the review whether SWFs engage in direct or indirect investments.

Direct cash transfers (DCTs): These are payments made by the government to eligible recipients. DCTs are common in most countries and are frequently used for social assistance to the needy in the form of unemployment benefits, sickness benefits, and age or disability pensions. Temporary cash transfers are also made to eligible populations in exceptional circumstances, such as natural disasters or rapidly rising food prices.

Sometimes cash transfers are *conditional*. For example, the transfers may be made on the condition that school-age children of the recipient households are enrolled in schools, or that women from these households regularly visit health clinics. Such conditional DCTs may combine the immediate aim of poverty reduction with a long-term aim of improving literacy and/or health outcomes.

For the purposes of the present systematic review, a key difference between DCTs and the other two revenue sharing arrangements is that DCTs tend to put the responsibility for allocation resources between current consumption and investment for the future in the hands of private individual rather than government officials (PIPs) or fund managers (SWFs).

In this connection, it should be noted that in some cases, especially where there is a high incidence of poverty or where poverty lines are defined in terms of daily calorie intake, governments may opt for in-kind transfers, by distributing food items to eligible populations through networks of public sector distribution outlets. For example, many states of India have established public distribution systems (PDS) for food in preference to cash transfers. It is clear that DCTs are conceptually much closer to PDS' than to either PIPs or SWFs. For this reason, we intend to include PDS' as a subset of DCTs in this review.

1.4 Research background

The literature on the above concepts and related issues is very large. However, as far as we are aware, there have been almost no previous *systematic* reviews of studies regarding the effects of natural resource revenue sharing and investment arrangements on economic growth and poverty reduction, where the term “systematic reviews” refers to reviews which are conducted along the lines advocated by the Cochrane and Campbell Collaborations, or the EPPI-Centre.³

The only exception of which we are aware is the systematic review conducted by Hagen-Zanker *et al.* (2011), which focuses on the impact of cash transfers and employment guarantee schemes on poverty. In addition, there are several excellent *conventional* surveys of the literature on conditional cash transfers (CCTs), including those conducted by Fiszbein and Schady (2009) and Rawlings and Rubio (2005). These surveys cover a wide range of theoretical and practical issues including the rationale, design, implementation, and impact of CCT programs. Program impact is typically evaluated in terms of development-related outcomes such as health, education, consumption, employment and poverty alleviation. In particular, Appendix B of Fiszbein and Schady (2009) is a very comprehensive synthesis review, if not quite a systematic review. It is apparent from these surveys and other papers that by now there is a sizable literature on CCTs, including studies based on experimental and quasi experimental designs. However, the evidence regarding the impact of DCTs on economic growth appears very scarce indeed.

Similarly, the literature on PIPs is vast, but only a minority of papers in this literature deal with the use of such investments as a means to share, and make the most of, revenues from natural resources, especially in a low- and middle-income country (LMIC) context. A seminal contribution by Aschauer (1989) demonstrates that public investment induces simultaneously an *ex ante* crowding out as well as a crowding in of private investment, so that the net effect is theoretically unclear. Empirical evidence for the US suggests that the net effect of public investment is

³ These include, e.g. the requirement that the review be conducted according to a pre-specified protocol and in a transparent, fully documented manner so that the review findings should, in principle, be replicable by a different set of reviewers using the same protocol.

to raise private investment, presumably with beneficial effects on overall economic growth. In related research, ‘core’ infrastructure spending is shown to be highly correlated with private-sector productivity (Aschauer 1988). The empirical evidence for developing economies appears mixed. Some studies find that public investment raises private investment (see, e.g. Ramirez 2000; Erden and Holcombe 2005) while others suggest that public investment decreases private investment (see, e.g. Cavallo and Daude 2008). There is also a growing literature that explores the linkage between public investment, growth and poverty reduction in developing economies (see, e.g. Fan, Hazell and Throat 1999; Foster, *et al.* 2003; DFID 2004; Calderon and Servén 2004). In a comprehensive survey of the literature, Anderson, Renzio and Levy (2006) suggest that the link between public investment and growth is not proven and the impact of public investment on poverty is inconclusive.

The literature on SWFs funded by natural resource revenue is also large (see, e.g. Fasano 2000; Davis *et al.* 2001; Melby 2002; Asfaha 2007; Rietveld and Pringle 2007; UNCTAD 2008; Park and Estrada 2009) but very few papers in this literature deal with the effects on economic growth or poverty reduction. Instead, they tend to provide information about the rationale, operation, size, growth and returns (profitability) performance of SWFs. Many of these papers focus on the role of stabilisation funds (reducing the impact of resource revenue volatility) but some studies do analyse the role of savings funds (creating a store of wealth for future generations). While many studies are mainly concerned with the fiscal successes or otherwise of SWFs, there exists a minor strand of the literature which is concerned with the transparency, accountability and corruption of SWFs (see, e.g. Fasano, 2006; Truman, 2007; Park and Estrada, 2009).

The choices between consumption, domestic investment and foreign assets accumulation have been studied by, among others, Collier (2007), Collier and Venables (2008), Collier *et al.* (2010), and van der Ploeg and Venables (2011). A key insight that has emerged from these studies is that in developing countries (where capital is scarce) resource revenues should be used primarily to finance domestic investment in order to expand the capital stock (including human capital, see Gylfason and Zoega 2006) and promote growth. By contrast, foreign assets should only be accumulated for the purpose of smoothing volatility in export revenues, rather than as a means of storing wealth for future generations. In practice, however, Bhattacharyya and Collier (2011) find that resource-rich countries tend to *under*-invest in their public capital stock.

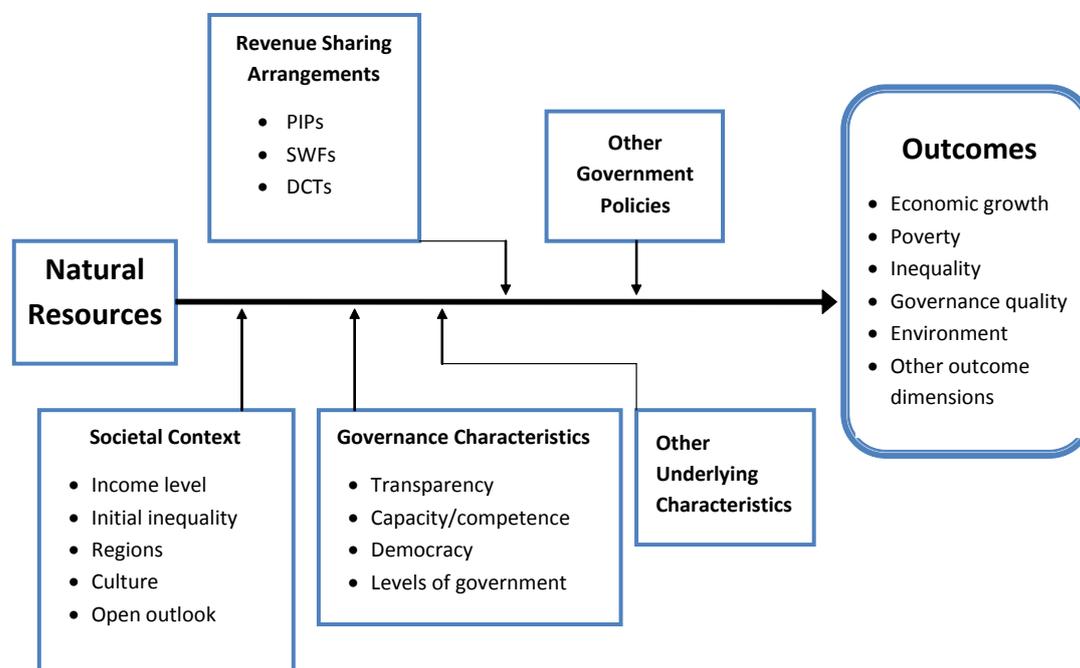
Overall, it appears that many existing studies are heavily context-based. In addition, there is an underlying view held by many authors that the above arrangements, especially SWFs and PIPs, would work well only in the context of sound institutional settings, trade/financial openness, and fiscal discipline.

1.5 Conceptual framework

Figure 1 illustrates the conceptual framework encompassing the above and other, similar relationships. In this framework, the *population* consists of LMICs which are rich in natural resources and which have experienced a resource boom. (In some contexts, e.g. when analysing the effects of DCTs, it may be more appropriate to interpret “population” as comprising individual residents of such a resource-rich country.) The *interventions* being considered comprise the three revenue sharing and investment arrangements discussed above: PIPs, SWFs and DCTs. A number of *outcome* dimensions are recognised, of which this review will focus on two: economic growth and poverty reduction. The framework can accommodate the

possible roles of other interventions (in the form of governmental policies) and of basic societal characteristics and *contexts* in determining the outcomes.

Figure 1: Conceptual framework



As Figure 1 illustrates, a resource boom generates revenues that can be used to fund revenue sharing arrangements (interventions) to promote economic growth, poverty reduction, and other desired outcomes. The effectiveness of each intervention depends in part on societal context, governance characteristics and other underlying characteristics, as well as on the government's policies in other areas.

Societal context: This has a number of dimensions including initial income level, initial distribution of income and wealth, region (location), culture and outlook. For example, the relationship between natural resources and the specified outcomes may depend on whether the country in question was initially a high-income country or a LMIC.

The initial income or wealth distribution (i.e., the distribution that prevails at the beginning of a resource boom) is normally captured by a single, summary measure such as the Gini index. Some studies have found that, other things remaining the same, high initial inequality tends to reduce the poverty alleviation impact of a given rate of economic growth (see, for example, Cervantes-Godoy and Dewbre 2010).

By “regions”, we mean to differentiate economies on the basis of their location, at either the sub-national or the international levels.

By “open outlook” we mean both trade openness and social openness. The former concept is usually measured by one or more of the following indicators:

- the ratio of exports over GDP
- the ratio of imports over GDP
- the ratio of the sum of imports and exports over GDP.

By contrast, social openness is essentially a qualitative concept relating to societal attitudes toward new ideas, new technology, foreign cultures and immigration.

Other terms, including **governance** and its characteristics, as well as **revenue sharing arrangements** have mostly been discussed in Section 1.3 above. As for **outcome** dimensions other than economic growth and poverty reduction, it should be noted that both inequality and governance quality may themselves *be affected* by the implementation of revenue sharing arrangements - that is, they may be *endogenous* to the system. It is also worth mentioning that environmental outcomes of the entire process may potentially be very important. Due to time and budget constraints, the focus of this review will be limited to the first two of the outcomes shown in the figure.

In terms of Figure 1, the objective of this systematic review can be restated more specifically as: to determine the effects of three revenue sharing arrangements funded by natural resource revenues on economic growth and poverty reduction in resource-rich, low- and middle-income countries, under two scenarios concerning the quality of governance (good and poor) and taking into account various societal contexts.

Ideally, public revenues to be used in the above arrangements should be clearly identified (or hypothecated) as arising from natural resources. In practice, however, natural resource revenues are typically merged with other revenues into a consolidated fund from which all public expenditures are financed. Therefore, clear hypothecation of revenues is quite exceptional, except in the case of many of the SWFs, which are sourced from natural resource revenues. Indeed, in some countries there are legal or constitutional prohibitions against such hypothecation of revenues. For example, the Chilean Constitution stipulates that taxes cannot be directly tied to expenditures, so that cash transfers for poverty reduction in Chile must be financed out of total tax revenues (see, Agostini and Brown 2007). Accordingly, in this review, DCTs and PIPs in resource-rich, low- and middle-income countries will be considered as if they were funded by natural resource revenues, irrespective of their precise revenue sources.⁴

Expected effects and hypothesised channels

Table 1 represents an initial attempt to move from the general conceptual framework depicted in Figure 1 to a more concrete, evidence-informed typology of channels through which natural resources and revenue sharing arrangements affect economic growth and poverty reduction performances. It is expected that, as evidence from the review is accumulated, this table (and possibly this review protocol) may need to be amended to reflect the emergent findings or insights.

We propose to separate conceptually the hypothesised channels on the basis of two scenarios with respect to governance: “good” governance and “poor” governance. Whether governance is classified as good or bad depends mainly on the “governance characteristics” shown in the lower-central box in Figure 1.

Each transmission channel and its expected effect (based on our current understanding of existing theory and weight of evidence) will now be elaborated in turn. In each case, the expected effect is recorded as strongly positive, moderately positive, weakly positive, ambiguous, weakly negative, moderately negative, or strongly negative, where (for example) a moderately positive effect means that, other things being equal, the intervention has a moderate and positive impact on

⁴ This assumption is likely to be reasonably realistic in most cases in practice, as it is the resource sector in most resource-rich countries that subsidises (in terms of net transfers of resources) the non-resource sectors, rather than the other way around.

the outcome. Our intention is to compare the findings from the reviewed studies with these prior expectations.

For ease of exposition, we shall first discuss the expected effects of revenue sharing arrangements in the presence of good governance, before turning to the expected effects under poor governance. The discussion throughout is based on economic theory under the implicit assumption of *ceteris paribus* (other things being equal). For convenience, each channel will be given a unique code.

Good Governance

Under good governance, public policy is designed and implemented in an efficient and effective manner with little wastage and corruptions. Using cost-benefit principles or equivalent decision rules, public funds are channelled towards projects or investments with highest rates of return overall. Similarly, SWFs and DCTs are both managed in a competent, accountable, and (where appropriate) transparent manner.

Public investment projects (PIPs)

GI1: Public investment increases a country's capital stock (capital deepening) leading to greater productive capacity. This raises labour productivity and has a moderately strong effect on economic growth and a weakly positive effect on poverty reduction (while all labour benefits, unskilled labour tends to benefit less).

GI2: Public investment (such as roads or bridges) acts as a prerequisite and facilitator of private investment. In this case PIPs have a strongly positive effect on economic growth and a weakly positive effect on poverty reduction, by improving connectivity with markets and urban centres and generating additional employment opportunities for unskilled workers.

GI3: Public investment contributes (especially through local content provisions) to the demand for local production and employment opportunities for local labour. The positive effects on poverty reduction may last beyond the initial impact period, due to the ongoing benefits of initial-period employment on individuals' skills and morale. By contrast, the positive effects on economic growth are likely to be more substantial in the short term than in the long term, when underlying determinants of productivity tend to dominate.

GI4: Public investment in agriculture and rural areas. In this case PIPs have a strongly positive effect on poverty reduction because they directly raise the productivity of rural workers who tend to be poor. However, their effects on economic growth are likely to be weakly positive as agricultural growth tends to account for a relatively small proportion of overall growth.

GI5: Crowding out. Public investment tends to raise the cost of private investment through higher interest rates. This is known as the *crowding out* effect of public expenditure. Some authors have also suggested that public expenditure tends to affect business expectations and confidence adversely (e.g. Alesina *et al.* 2002). At this stage it is assumed that these mechanisms have a weakly negative effect on both economic growth and poverty reduction.

GI: In view of the above discussion, it is hypothesised that overall PIPs have a moderately positive effect on economic growth and a weakly positive effect on poverty reduction.

Table 1				
Expected Effects and Hypothesised Channels				
	Arrangement	Chanel	Effects on Economic Growth	Effects on Poverty Reduction
Good Governance	Public Investment Projects (PIPs)	GI1: Increased capital stock	++	+
		GI2: Public infrastructure as prerequisite	+++	+
		GI3: Impact on local production and employment	+	++
		GI4: Public investment in agriculture and rural areas	+	+++
		GI5: Crowding out	-	-
		GI: Net effects of PIPs	++	+
	Sovereign Wealth Funds (SWFs)	GF1: Reducing fiscal revenue volatility & vulnerability	+	+
		GF2: Countering business cycle	+	+
		GF3: Reducing real exchange rate appreciation	++	+
		GF4: Store of wealth	+	+
		GF5: International investment	+	?
		GF: Net effects of SWFs	+	+
	Direct Cash Transfers (DCTs)	GT1: Increase in consumption	+	+++
		GT2: Increase in investment	++	++
		GT3: Increase in hoarding	?	+
		GT4: Impact on work incentives	--	?
		GT: Net effects of DCTs	+	++
	Poor Governance	PIPs	GI: Benchmark from good governance case	++
PI1: Poor project design or implementation			-	?
PI2: Corruption and plundering			--	-
PI: Net effects of PIPs			-	?
SWFs		GF: Benchmark from good governance case	+	+
		PF1: Poor investment management	-	?
		PF3: Plundering & misuse	--	-
		PF: Net effects of SWFs	-	?
DCTs		GT: Benchmark from good governance case	+	++
		PT1: Poor implementation	-	-
		PT2: Corruption & diversion	-	-
		PT: Net effects of DCTs	?	+

Notes:

+++ Strong positive effect

++ Moderate positive effect

+ Weak positive effect

--- Strong negative effect

-- Moderate negative effect

- Weak negative effect

? Ambiguous or insignificant effect

Sovereign wealth funds (SWFs)

GF1: Reducing fiscal revenue volatility and vulnerability to contingencies. Public-sector revenue in resource-rich countries can fluctuate due to the high volatility in resources prices and unpredictability of extraction. SWFs can be used as a device to reduce such volatility in fiscal revenue. Similarly, the money available from SWFs can be used to pay for future contingencies such as natural disasters or military efforts. Since these are primarily concerned with stabilisation, their expected effects on economic growth and poverty reduction are indirect and only weakly positive.

GF2: Countering business cycle. In addition to fluctuations in resource prices and major contingencies, a resource-rich economy may also be subjected to normal business-cycle fluctuations. Again, SWFs can be used to counter the adverse effects of these by smoothing out government spending. This stabilisation role of SWFs is considered as having an indirect and weakly positive effect on economic growth and poverty reduction.

GF3: Reducing real exchange rate appreciation. It is well known that when resource-rich countries receive large inflows of foreign exchange in payment for their exports, they may also experience significant real exchange rate appreciation. This is known as the *Dutch disease*, which adversely affects the competitiveness of the non-resource sectors of the economy. If a SWF invests primarily overseas, this will tend to reduce the net inflows of foreign exchange and therefore to reduce the extent of real appreciation. Since this channel has a direct impact on the country's non-resource sectors, its expected effect is considered to be moderately positive on economic growth (but weakly positive on poverty reduction).

GF4: Store of wealth and intergenerational equity. Natural resources are not only subjected to price fluctuations and extraction unpredictability but also to exhaustability. SWFs funded by resource revenues can be employed to build up savings for the longer term, including future generations. In this way, SWFs are regarded as having a weakly positive effect on both economic growth and poverty reduction.

GF5: International investment. To the extent that they invest globally, SWFs make financial resources available for investment worldwide. This may help to create a healthy global market, particularly where there are major shortfalls between the investment requirements and domestic savings of some other countries. In a general-equilibrium sense this may also help to promote a steady global demand for natural sources. This channel is expected to have an indirect and weakly positive on economic growth, and an insignificant effect on poverty reduction.

GF: It is hypothesised that overall SWFs have a weakly positive effect on both economic growth and poverty reduction.

Direct Cash Transfers (DCTs)

The effects of DCTs on long-term economic growth and short-term poverty reduction depend critically on whether the cash transfers are immediately consumed or saved and invested in education, personal health, or business activities.

GT1: Immediate increase in consumption. This would increase overall demand, especially for foodgrains, dairy products, fruit and vegetables, clothing and household goods. In the medium-to-longer term, this may trigger supply responses and generate higher levels of domestic output, thus boosting economic growth, or may simply translate into higher demands for imported foodstuffs and consumer

products. The effect on poverty reduction is likely to be immediate and strongly positive, as cash transfers will add to household income and relieve pressures of extreme poverty.

GT2: Increase in investment. If the cash transfers lead to greater investment in terms of accessing education for the children, or health care, medicines and prevention of diseases for the sick and vulnerable, or investing in business activities, the effect on aggregate demand will be weaker in the short- and medium-term, but the effect on domestic production capability will be stronger in the longer term. Likewise, the effect of poverty reduction will be lower in the short-term but higher and more sustainable in the longer term.

GT3: Increase in hoarding. It is possible that cash transfers are, in the main, neither consumed nor invested, but are hoarded by the household for a rainy day. This may be the preferred option in an environment where cash transfers are not expected to continue for a long time, education is not highly regarded, facilities for health care are non-existent, and there is no access to or trust in the financial system. Thus the saved funds will not circulate in the economy until the rainy day arrives (if the hoardings are recycled through the financial system, the situation will then be conceptually similar to the case of GT2). In the GT3 case, the impact on poverty will be weak and the impact on economic growth may be insignificant.

GT4: The impact of cash transfers on work incentives will depend on the societal and cultural context. If cash transfers are viewed as free gifts from the government and discourage the recipients from working harder or learning new skills, their impact on long-term economic growth may be moderately negative, even though their impact on poverty reduction may still be (weakly) positive in the short run, as the disposable income of recipient households has increased. However, in the longer term, the lack of work incentives may have a negative effect on *sustainable* poverty reduction.

GT: In view of these considerations, the net effect of DCTs on economic growth is considered to be weak but positive, and the net effect on poverty reduction is moderately positive.

Poor Governance

In the presence of poor governance, public policies tend to be inefficient and ineffective. In terms of policy design, the influence of individual officials and vested interest groups may be excessive. Thus public funds are not always channelled to projects with highest overall benefits. The conduct and implementation of policy also lacks transparency and may be hampered by poor coordination, lack of competence, and lack of accountability. This may give rise to a culture of wasteful behaviour and corruption.

In our conceptual framework, these problems result in “negative channels” which tend to reduce or negate the generally positive effects identified under the good governance scenarios. The loss in effectiveness under poor governance depends on the type of revenue sharing arrangements. While PIPs and SWFs are expected to perform much worse, DCTs may prove to be more robust to relatively poor governance.

For convenience, in Table 1, the good-governance “net-effect” or “overall” channels GI, GF, and GT are replicated as the “starting points” or “benchmarks” in the corresponding poor-governance scenarios. The negative channels are then applied to (“deducted from”) these benchmarks to derive net/overall effects.

Public investment projects

PI1: Poor project design or implementation. This would tend to have a negative *marginal* impact on economic growth performance (by “marginal”, we mean “in comparison with the corresponding, overall good-governance case” which in this instance is the channel GI).

PI2: Corruption or plundering. This would have a moderate, negative marginal impact on economic growth, and therefore a weak, negative marginal impact on poverty reduction performance.

PI: Combining GI with PI1 and PI2, we would expect the net impact of PIPs in poor governance regimes on economic growth to be weak and negative, while the impact on poverty reduction is ambiguous.

Sovereign wealth funds

PF1: Poor management of investments due to, e.g. lack of expertise. This would probably have only a minor marginal impact on the economic growth outcome variable.

PF2: Plundering and misuse. This is likely to have a moderate, negative marginal impact on economic growth, and therefore a weak, negative marginal impact on poverty reduction performance.

PF: Combining GF with PF1 and PF2, we would expect the net impact of SWFs in poor governance regimes on economic growth to be weak and negative, while the impact on poverty reduction is ambiguous.

Direct cash transfers

PT1: Poor implementation and management of the transfers programmes due to, e.g. lack of coordination and competence. This would probably have a minor marginal impact on both the outcomes variables.

PT2: Corruption and diversion of funds. This is likely to have a negative marginal impact on both outcomes variables.

PT: Combining GT with PT1 and PT2, we would expect the net impact of DCTs in poor governance regimes on economic growth to be ambiguous, while the impact on poverty reduction is likely to be weak but positive.

1.6 Objectives of review

In terms of the concepts illustrated in Figure 1, the objective of this systematic review can be restated specifically as: to determine the effects of three revenue sharing arrangements funded by natural resource revenues on economic growth and poverty reduction in resource-rich, low- and middle-income countries, under two scenarios concerning the quality of governance (good and poor) and taking into account various societal contexts.

1.7 Review approach

Due to the unresolved nature of the theoretical literature in this area as well as the expected heterogeneity of contexts and findings of the studies to be reviewed, we propose to follow an iterative, mixed-methods approach which is largely based on the framework synthesis approach, supplemented where appropriate with elements drawn from the realist approach.

As Table 2 illustrates, we intend to collect both quantitative data and findings (e.g. from randomised controlled trials and econometric studies) and qualitative information and findings (e.g. from qualitative analyses and single case studies). Indeed, we intend to include in the review studies based on either purely theoretical models or calibrated models (e.g. computable general equilibrium models).

Table 2: Empirical Findings and Theoretical Predictions

Synthesis	Type of studies	PIPs	SWFs	DCTs
Aggregation	Randomised Controlled Trials			Y
	Econometric Studies	Y		Y
Framework	Computable GE Models	Y	Y	
	Theoretical Models	Y	Y	Y
Configuration	Qualitative Analyses	Y	Y	Y
	Single Case Studies	Y	Y	Y

Note

Y: empirical findings or theoretical predictions are expected to be available from studies of the type shown.

We propose to perform the following steps:

1. Start from a conceptual framework (as described in Section 1.5 above) which is constructed on the basis of predictions made with the use of theoretical and CGE models, and on the empirical evidence available to us at the beginning of the review process
2. Collect additional evidence:
 - Quantitative findings which may be aggregated to either validate/confirm or refute/invalidate elements of the conceptual framework (some quantification of the relevant effect or mechanism may be involved)
 - Qualitative findings which may be configured to either validate/confirm or refute/invalidate elements of the conceptual framework
 - Predictions and insights from theoretical and CGE models which may be configured to confirm, reject, revise, or extend elements of the conceptual framework

If, at any point during this data collection process, the amendments to the conceptual framework are considered sufficiently significant, go directly to Step 3.

Otherwise, continue until all selected studies have been reviewed, then go to Step 4.

3. Amend the protocol, then restart the review process by going back to Step 1.
4. Synthesise the collected findings, with the conceptual framework serving as a guide.

One implication of the proposed approach is that we accept that during the course of the review it may be necessary to revise the current review protocol in order to accommodate major new findings that require fundamental changes to the conceptual framework. If that should eventuate, both the original and the revised protocols will be made available to ensure the transparency of the entire review process, and to facilitate its potential replicability, e.g. by another review team.

2. Methods used in the review

Outline of chapter

This chapter describes the methods we propose to use in conducting this systematic review. It follows the standard outline suggested for EPPI-Centre review protocols, a recent example of which is Stewart *et al.* (2011). The chapter will discuss how we intend to seek user involvement in the review process to help ensure that review findings are relevant and useful. It then describes how we plan to search, identify, describe and select studies to be reviewed. This is followed by an outline of methods for assessing the quality of the studies selected. Finally, we will indicate the methods we propose to use in synthesising the findings from these studies.

2.1 User involvement

2.1.1 Approach and rationale

Our overall approach is to seek user involvement in all stages of the review, from designing the review, through conducting the searches to interpreting and communicating the review findings. Such close involvement by users will help us to be more aware of issues, information and insights that are of particular importance to them.

We identify three main groups of potential users of the review findings:

1. Policy advisers at development assistance agencies and international organisations, such as AusAID, DFID, 3ie, World Bank, UNDP, and ADB.
2. Other researchers in the economic development field. Of particular interest is the fact that many such researchers are unfamiliar with the systematic (Cochrane-Campbell-EPPI) approach to the reviewing process.
3. Policymakers and members of the public in LMICs with significant natural resource revenues.

Ultimately it is the third group that would potentially have the most to gain from the review. In the near term, because of time and financial constraints, we will need to utilise existing forums and networks (such as international conferences, research centres and online research networks) to reach as wide a group of these potential users as possible.

At the same time, we recognise that the first and second groups of users may (through their accumulated knowledge and experiences) be able to provide feedback which reflects the views of many members of the third group. The critical requirement in this regard would be to ensure that sufficient “primary” feedback is obtained directly from the third group to provide consistency-checks with the “secondary” feedback received via the first and second groups. In the longer term, it is hoped that findings from the review will be disseminated through both academic and policy channels to reach more members of the third group.

2.1.2 Methods to be used

We will use internal review milestones and expected review deliverables as a means to engage with users. As is the case with Stewart *et al.* (2011) this will include:

- Circulating the current review protocol and inviting feedback
- Seeking suggestions regarding relevant studies for possible inclusion in the review, or sources where such studies may be found
- Seeking feedback on our draft review report; and
- Presenting review findings to peer groups, such as departmental seminars, conferences, etc. for comments and suggestions
- Disseminating the final review report

We plan to interact closely with the following organisations and forums/networks:

- AusAID (funders of this review). We will invite their feedback and inputs regarding all stages of the review, as well as their suggestions regarding other organisations or individuals that we should approach.
- the EPPI-Centre, which has registered this review and is providing technical support. The Centre will help us to form an Advisory Group, and will help to arrange peer refereeing of our review protocol and draft review report.
- the Resource Management in Asia-Pacific (RMAP) Program at the College of Asia & the Pacific, Australian National University. We will seek their suggestions regarding possible contacts and relevant studies relating to the management of natural resources in countries in the Asia-Pacific region.
- the Development Studies Network, based at the Australian National University.
- the Australian Bureau of Agricultural and Resource Economics and Sciences in Canberra.
- the Oxford Centre for the Analysis of Resource Rich Economies, based at Oxford University.
- the Centre for the Study of African Economies, based at Oxford University.
- the Revenue Watch Institute.

Once the final review report is completed, we will seek to further disseminate the review findings through publication in international journal(s) in economics generally, or in development economics specifically.

2.2 Identifying and describing studies

2.2.1 Defining relevant studies: inclusion and exclusion criteria

INTERVENTION: We will include only studies dealing with the following three interventions (revenue sharing and investment arrangements): PIPs, SWFs and DCTs.

STUDY DESIGN: We will include quantitative as well as qualitative studies. These are expected to include randomised controlled trialled, regression analyses, qualitative analyses and single case studies. We will also include analyses based on theoretical and computable general equilibrium models, in order to refine and update our conceptual framework if necessary.

COUNTRIES: In general, we will include only studies relating to LMICs.

OUTCOMES: For this review, we will include studies which analyse effects of the interventions on two outcome dimensions: economic growth and poverty reduction performance.

LANGUAGE: Only studies completed in English will be included.

TIME PERIOD: Only studies published or completed after 1960 will be included.

2.2.2 Identification of potential studies: search strategy

Studies for possible inclusion in the review will be identified from the following sources (Appendix 2.1 provides a draft search strategy to be used with two bibliographic databases, Econlit and Business Source Premier).

BIBLIOGRAPHIC DATABASES AND RESOURCES

- Econlit - Economics and allied disciplines
- Business Source Premier
- PAIS International
- Nexis Lexis
- Cochrane Library
- Campbell Library
- EPPI-Centre databases/library
- 3ie databases of impact evaluations and systematic reviews
- British Library for Development Studies (<http://blds.ids.ac.uk/>)
- ELDIS
- GDNNet - global development network
- British Library catalogue
- Library of Congress catalog
- JOLIS (IMF World bank)
- OECD i-library
- The United Nations Economic Commission for Africa (UNECA) institutional repository <http://repository.uneca.org/>

- WHOLIS
- OAlster
- BIREME/PAHO
- Social care databases (SSCI, ASSIA, Social Service Abstracts)
- IBSS - International Bibliography of the Social Sciences
- JSTOR - Social sciences
- Science Direct - All sciences and humanities
- SSRN - Social Science Research Network:
<http://papers.ssrn.com/sol3/DisplayAbstractSearch.cfm>
- REPEC - Research Papers In Economics:
<http://econpapers.repec.org/scripts/search/search.asp?pg=-1>
- NBER Working Papers: <http://www.nber.org/papers>
- World Bank : <http://publications.worldbank.org/>
- IMF: <http://www.imf.org/external/pubind.htm>
- ADB - Asia Development Bank: <http://www.adb.org/Statistics/publications.asp>
- AFDB - Africa Development Bank:
<http://www.afdb.org/en/documents/evaluationreports/>;
<http://www.afdb.org/en/documents/publications/working-paper-series/>
- EBRD - European Bank for Reconstruction and Development:
<http://www.ebrd.com/pages/research/publications.shtml>
- African journals online
- Asian journals online
- Latin American journals online,
- Internet library sub-Saharan Africa <http://www.ilissafrika.de/en/>
- Africana Periodical Literature Bibliographic Database
- Centre for International Development - Harvard University:
<http://www.hks.harvard.edu/centers/cid/publications>
- Third World Network: <http://www.twinside.org.sg/pos.htm>
- Google and Google Scholar

CITATION SEARCHES AND REFERENCE LISTS OF KEY PAPERS

Based on key papers (including systematic and conventional review papers) cited in the list of references.

OTHER STRATEGIES

- Searches based on recommendations from key contacts
- Handsearching of recent issues (from 2010 onwards) of key journals in economics, development economics, economic growth, resource policy, and public finance (list of journals will be based mainly on the citations in this protocol's list of references)

- A database system (supported by the software EPPI-Reviewer 4) will be set up to keep track of and manage studies found during the review. Titles and abstracts will be imported or entered manually into the first of these databases.

2.2.3 Screening studies: applying inclusion and exclusion criteria

Inclusion and exclusion criteria will be applied successively to (i) titles and abstracts, and then to (ii) full reports. The criteria will be piloted in screening samples of studies before being applied to all studies found.

Full reports will be obtained only for those studies that appear, upon the first screening, to meet the inclusion criteria. These reports will be entered into a second database. The inclusion and exclusion criteria will be re-applied to the full reports and those that do not meet these criteria will be excluded at this second screening.

2.2.4 Characterising included studies

The studies remaining after the two screenings will be characterised using the EPPI-Centre's standard coding tool. Additional keywords which are specific to the context of the review will be added.

Each study will be coded for the year of publication or completion.

Studies will also be characterised according to whether they deal with PIPs, SWFs or DCTs, and whether they report outcomes in terms of economic growth and/or poverty reduction, at the national or sub-national level, and in low- or middle-income, and good- or poor-governance countries.

Another characteristic that will need to be coded is the study method, e.g. econometrics, CGE, or case studies.

All the keyworded studies will be added to the larger EPPI-Centre database, for others to access via the website.

2.3 Assessing quality of studies

Studies identified as meeting the inclusion criteria will be analysed in depth, using the EPPI-Centre's detailed data-extraction software, EPPI-Reviewer 4.

The quality of each included study will be assessed mainly in terms of its internal soundness, e.g. whether it involves flawed logic, inappropriate or biased analysis, or obvious errors. Studies whose analysis is judged to be clearly unsound will be excluded. Such cases are likely to be quite rare, and the exclusion will only occur if the assessment of unsound analysis is reached independently by at least two reviewers.

2.4 Synthesis of findings from studies included

2.4.1 Overall approach to and process of synthesis

As discussed in Section 1.7 above, our overall approach to synthesising the findings from the selected studies is to use framework synthesis, where pre-determined categories are applied to the relevant data (here, the findings): from this, structured comparisons are conducted, which may lead to a synthesis of the relevant findings or a revision of the framework (categorisation system) itself.

Our approach also incorporates some elements of realist synthesis, in that there is an emphasis on channels or mechanisms through which the relevant intervention (here, the revenue sharing arrangement) affects each outcomes variable, and a readiness to revise the description of these channels in order to reflect newly accumulated empirical evidence.

2.4.2 Process used to combine/synthesise findings

As illustrated in Figure 2 and explained in Section 1.7, findings from quantitative as well as qualitative studies and from theoretical and calibrated models can all be used in the synthesis process. It may be possible to statistically aggregate quantitative findings such as effect size through meta-analysis techniques, and the resultant estimates can then be compared with the corresponding prior expectations embodied in the pre-determined framework. However, the findings from pilot samples of studies appear to be very heterogeneous. A second approach is to configure qualitative findings and theoretical predictions with a view to generating new insights or validating/refuting old ones. We intend to follow both approaches.

A narrative synthesis of data at the mapping stage may inform the decision to group some studies together. Forest plots and related techniques will be used to assess publication bias.

If the framework is revised significantly during the synthesis process, so that major changes are made to the categories, the entire analysis may need to be repeated iteratively, until no further significant changes are required.

2.5 Quality assurance

The inclusion and exclusion criteria and the keywords to be used in coding will be trialled by at least two review team members who will work independently and then compare their decisions. Based on their experiences, these criteria and keywords may be revised and fine-tuned before they are finalised for use by all team members.

Another means of quality assurance is to disseminate widely information about the processes and findings of the review. Feedback from a wide range of interested persons will help the review team to identify shortcomings and to deal with them.

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Appendices

Appendix 1.1: Authorship of this review

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Appendix 1.2: List of low- and middle-income countries

35

Low-income economies (\$1,005 or less)

Afghanistan	Gambia, The	Myanmar
Bangladesh	Guinea	Nepal
Benin	Guinea-Bissau	Niger
Burkina Faso	Haiti	Rwanda
Burundi	Kenya	Sierra Leone
Cambodia	Korea, Dem Rep.	Somalia
Central African Republic	Kyrgyz Republic	Tajikistan
Chad	Liberia	Tanzania
Comoros	Madagascar	Togo
Congo, Dem. Rep	Malawi	Uganda
Eritrea	Mali	Zimbabwe
Ethiopia	Mozambique	

56

Lower-middle-income economies (\$1,006 to \$3,975)

Angola	India	São Tomé and Príncipe
Armenia	Iraq	Senegal
Belize	Kiribati	Solomon Islands
Bhutan	Kosovo	Sri Lanka
Bolivia	Lao PDR	Sudan
Cameroon	Lesotho	Swaziland
Cape Verde	Marshall Islands	Syrian Arab Republic
Congo, Rep.	Mauritania	Timor-Leste
Côte d'Ivoire	Micronesia, Fed. Sts.	Tonga
Djibouti	Moldova	Turkmenistan
Egypt, Arab Rep.	Mongolia	Tuvalu
El Salvador	Morocco	Ukraine
Fiji	Nicaragua	Uzbekistan
Georgia	Nigeria	Vanuatu
Ghana	Pakistan	Vietnam
Guatemala	Papua New Guinea	West Bank and Gaza
Guyana	Paraguay	Yemen, Rep.
Honduras	Philippines	Zambia
Indonesia	Samoa	

Upper-middle-income economies (\$3,976 to \$12,275)

Albania	Ecuador	Namibia
Algeria	Gabon	Palau
American Samoa	Grenada	Panama
Antigua and Barbuda	Iran, Islamic Rep.	Peru
Argentina	Jamaica	Romania
Azerbaijan	Jordan	Russian Federation
Belarus	Kazakhstan	Serbia
Bosnia and Herzegovina	Latvia	Seychelles
Botswana	Lebanon	South Africa
Brazil	Libya	St. Kitts and Nevis
Bulgaria	Lithuania	St. Lucia
Chile	Macedonia, FYR	St. Vincent and the Grenadines
China	Malaysia	Suriname
Colombia	Maldives	Thailand
Costa Rica	Mauritius	Tunisia
Cuba	Mayotte	Turkey
Dominica	Mexico	Uruguay
Dominican Republic	Montenegro	Venezuela, RB

Appendix 2.1: Search strategy for electronic databases

For EconLit

- 1 ((public or government or national or state) adj2 investment\$).mp. (5866)
- 2 ((public or government or national or state) adj2 (expenditure\$ or capital)).mp. (17292)
- 3 (investment\$1 adj2 (building\$ or road\$1 or school\$1 or hospital\$1 or education or housing or amenities or infrastructure or sanitation or social security or machinery or facilities or research or training or development)).mp. (3855)
- 4 (expenditure\$1 adj2 (building\$ or road\$1 or school\$1 or hospital\$1 or education or housing or amenities or infrastructure or sanitation or social security or machinery or facilities or research or training or development)).mp. (2350)
- 5 pension fund\$1.mp. (6184)
- 6 reserve fund\$1.mp. (39)
- 7 long-term investment\$1.mp. (282)
- 8 (physical adj2 investment\$1).mp. (327)
- 9 (foreign currenc\$ deposit\$1 or reserve currenc\$).mp. (215)
- 10 (investment adj2 (corporation\$ or authorit\$ or portfolio\$)).mp. (10871)
- 11 invest\$ asset\$1.mp. (113)
- 12 reserve asset\$1.mp. (70)
- 13 reserve fund\$1.mp. (39)
- 14 (special drawing right\$1 or SDR\$).mp. (272)
- 15 (fund\$1 adj2 distribution).mp. (72)
- 16 war chest\$.mp. (14)
- 17 (cash adj2 transfer\$).mp. (477)
- 18 (cash adj2 distribut\$).mp. (103)
- 19 (transfer adj2 payment\$1).mp. (408)
- 20 cct\$.mp. (69)
- 21 (cash adj2 payment\$).mp. (183)
- 22 (money adj2 transfer\$).mp. (138)
- 23 government bond\$1.mp. (851)
- 24 or/1-23 (41986)
- 25 (sovereign wealth or SWF\$).mp. (216)
- 26 sovereign bond\$1.mp. (207)
- 27 (resource rich or resource revenue\$ or resource asset\$ or resource nationalism).mp. (276)
- 28 ((state or national or government) adj3 welfare fund\$1).mp. (1)
- 29 ((progresa or oportunidades) adj3 (mexico or mexican)).mp. (56)
- 30 (bolsa escola or bolsa familia).mp. (20)
- 31 bono de desarrollo humano.mp. (3)
- 32 (familias adj2 accion).mp. (12)
- 33 advancement through health.mp. (1)
- 34 chile solidario.mp. (6)
- 35 China Investment corporation.mp. (7)
- 36 or/25-35 (793)
- 37 (natural adj2 resource\$1).mp. (36639)
- 38 (oil\$1 or petrol\$ or gas or gasoline or fuel\$1).mp. (21638)
- 39 (ore\$1 or gold or silver or iron or coal or copper or tin or zinc or mineral\$1).mp. (8428)
- 40 (resource rich or resource revenue\$ or resource asset\$ or resource nationalism).mp. (276)
- 41 (forest\$ or deforest\$ or timber).mp. (6808)
- 42 (hydroelectric\$ or hydro electric\$).mp. (228)
- 43 or/37-42 (65489)
- 44 24 and 43 (1386)
- 45 36 or 44 (2146)

Key to EconLit:

\$	truncation symbol
\$1	truncation to one letter only
adj2	words must appear with 2 words of each other
.mp.	searches are restricted to the title, abstract, subject heading and other fields
or/1-23	combine sets 1 to 23 using OR

For Business Source Premier

#	Query	Results
S51	S42 or S50 Limiters - Publication Type: Academic Journal, Book, Country Report	1892
S50	S29 and S49	3628
S49	S43 or S44 or S45 or S46 or S47 or S48	486389
S48	TI (hydroelectric* or "hydro electric*") or AB (hydroelectric* or "hydro electric*")	2543
S47	TI (forest* or deforest* or timber) or AB (forest* or deforest* or timber)	33193
S46	TI (ore or ores or gold or silver or iron or coal or copper or tin or zinc or mineral*) or AB (ore or ores or gold or silver or iron or coal or copper or tin or zinc or mineral*)	133247
S45	TI (oil or oils or petrol or petroleum or gas or gasoline or fuel or fuels) or AB (oil or oils or petrol or petroleum or gas or gasoline or fuel or fuels)	285201
S44	TI (natural N2 resource*) or AB (natural N2 resource*)	12150
S43	DE "ENERGY industries" OR DE "BIOGAS industry" OR DE "BIOMASS energy industries" OR DE "CLEAN energy industries" OR DE "COAL mines & mining" OR DE "ELECTRIC utilities" OR DE "FUEL trade" OR DE "GAS industry" OR DE "NUCLEAR industry" OR DE "PETROLEUM -- Export & import trade" OR DE "PETROLEUM industry" OR DE "SOLAR energy industries" OR DE "TIDAL power industry" OR DE "WIND power industry" OR DE "MINERAL industries" OR DE "AGGREGATE industry" OR DE "ASBESTOS industry" OR DE "CERAMIC industries" OR DE "COBALT industry" OR DE "HARD rock minerals industry" OR DE "MINE management" OR DE "NONFUEL minerals industry" OR DE "PETROLEUM industry" OR DE "RADIUM mines & mining" OR DE "REFRACTORIES industry"	102532
S42	S30 or S31 or S32 or S33 or S34 or S35 or S36 or S37 or S38 or S39 or S40 or S41	2428
S41	TI ("China Investment corporation") or AB ("China Investment corporation")	25
S40	TI ("chile solidario") or AB ("chile solidario")	1
S39	TI ("advancement through health") or AB ("advancement through health")	0

S38	TI (familias N2 accion) or AB (familias N2 accion)	2
S37	TI ("bono de desarrollo humano") or AB ("bono de desarrollo humano")	4
S36	TI ("bolsa escola" or "bolsa familia") or AB ("bolsa escola" or "bolsa familia")	19
S35	TI (progresas N3 mexico or progresas N3 mexican or oportunidades N3 mexico or oportunidades N3 mexican) or AB (progresas N3 mexico or progresas N3 mexican or oportunidades N3 mexico or oportunidades N3 mexican)	34
S34	TI (state N3 "welfare fund*" or national N3 "welfare fund*" or government N3 "welfare fund*") or AB (state N3 "welfare fund*" or national N3 "welfare fund*" or government N3 "welfare fund*")	29
S33	TI ("resource rich" or "resource revenue*" or "resource asset*" or "resource nationalism") or AB ("resource rich" or "resource revenue*" or "resource asset*" or "resource nationalism")	357
S32	TI ("sovereign bond" or "sovereign bonds") or AB ("sovereign bond" or "sovereign bonds")	764
S31	TI ("sovereign wealth" or SWF*) or AB ("sovereign wealth" or SWF*)	1178
S30	DE "SOVEREIGN wealth funds"	564
S29	(S1 or S2 or S3 or S4 or S5 or S6 or S7 or S8 or S9 or S10 or S11 or S12 or S13 or S14 or S15 or S16 or S17 or S18 or S19 or S20 or S21 or S22 or S23 or S24 or S25 or S26 or S27 or S28)	78406
S28	TI ("government bond or bonds") or AB ("government bond or bonds")	1
S27	TI (money N2 transfer or money N2 transfers) or AB (money N2 transfer or money N2 transfers)	1278
S26	TI (cash N2 payment or cash N2 payments) or AB (cash N2 payment or cash N2 payments)	1602
S25	TI (cct or ccts) or AB (cct or ccts)	318
S24	TI (transfer N2 payment or transfer N2 payments) or AB (transfer N2 payment or transfer N2 payments)	852
S23	TI (cash N2 distribut*) or AB (cash N2 distribut*)	501
S22	TI ("invest* asset" or "invest* assets") or AB ("invest* asset" or "invest* assets")	1087
S21	TI (cash N2 transfer*) or AB (cash N2 transfer*)	507
S20	TI ("war chest*") or AB ("war chest*")	329
S19	TI (fund N2 distribution or funds N2 distribution) or AB (fund N2 distribution or funds N2 distribution)	930
S18	TI ("special drawing right*" or SDR or sdrs) or AB ("special drawing right*" or SDR or sdrs)	884
S17	TI ("reserve fund*") or AB ("reserve fund*")	803
S16	TI ("reserve asset*") or AB ("reserve asset*")	378

S15	TI (investment N2 corporation* or investment N2 authorit* or investment N2 portfolio*) or AB (investment N2 corporation* or investment N2 authorit* or investment N2 portfolio*)	8253
S14	TI ("foreign currenc* deposit*" or "reserve currenc*") or AB ("foreign currenc* deposit*" or "reserve currenc*")	391
S13	TI (physical N2 investment*) or AB (physical N2 investment*)	253
S12	TI ("long term investment*") or AB ("long term investment*")	1582
S11	TI ("reserve fund" or "reserve funds") or AB ("reserve fund" or "reserve funds")	786
S10	TI ("pension fund*") or AB ("pension fund*")	14689
S9	DE "PENSION trusts -- Investments"	971
S8	TI (expenditure* N2 infrastructure or expenditure* N2 sanitation or expenditure* N2 "social security" or expenditure* N2 machinery or expenditure* N2 facilities or expenditure* N2 research or expenditure* N2 training or expenditure* N2 development) or AB (expenditure* N2 infrastructure or expenditure* N2 sanitation or expenditure* N2 "social security" or expenditure* N2 machinery or expenditure* N2 facilities or expenditure* N2 research or expenditure* N2 training or expenditure* N2 development)	1687
S7	TI (expenditure* N2 building* or expenditure* N2 road* or expenditure* N2 school* or expenditure* N2 hospital* or expenditure* N2 education or expenditure* N2 housing or expenditure* N2 amenities) or AB (expenditure* N2 building* or expenditure* N2 road* or expenditure* N2 school* or expenditure* N2 hospital* or expenditure* N2 education or expenditure* N2 housing or expenditure* N2 amenities)	1047
S6	TI (investment* N2 infrastructure or investment* N2 sanitation or investment* N2 "social security" or investment* N2 machinery or investment* N2 facilities or investment* N2 research or investment* N2 training or investment* N2 development) or AB (investment* N2 infrastructure or investment* N2 sanitation or investment* N2 "social security" or investment* N2 machinery or investment* N2 facilities or investment* N2 research or investment* N2 training or investment* N2 development)	13399
S5	TI (investment* N2 building* or investment* N2 road* or investment* N2 school* or investment* N2 hospital* or investment* N2 education or investment* N2 housing or investment* N2 amenities) or AB (investment* N2 building* or investment* N2 road* or investment* N2 school* or investment* N2 hospital* or investment* N2 education or investment* N2 housing or investment* N2 amenities)	3805
S4	TI (public N2 capital or government N2 capital or national N2 capital or state N2 capital) OR AB (public N2 capital or government N2 capital or national N2 capital or state N2 capital)	6578
S3	TI (public N2 expenditure* or government N2 expenditure* or national N2 expenditure* or state N2 expenditure*) OR AB (public N2 expenditure* or government N2 expenditure* or national N2 expenditure* or state N2 expenditure*)	7184

S2	TI (public N2 investment* or government N2 investment* or national N2 investment* or state N2 investment*) OR AB (public N2 investment* or government N2 investment* or national N2 investment* or state N2 investment*)	13193
S1	DE "PUBLIC investments" OR DE "INVESTMENT of public funds"	2397

Key to Business Source Premier:

DE	indicates a subject heading
*	truncation symbol
N2	words must appear with 2 words of each other
TI	searches are restricted to the title field
AB	searches are restricted to the abstract field

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