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Resource Rents and Economic Growth: Economic and institutional development in countries with a high share of income from the sale of natural resources. Analysis and recommendations based on international experience

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Research Report

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RANEPA
THE RUSSIAN PRESIDENTIAL ACADEMY OF NATIONAL ECONOMY AND PUBLIC ADMINISTRATION

Resource Rents and Economic Growth

Economic and institutional development in countries with a high share of income from the sale of natural resources. Analysis and recommendations based on international experience

A report for the Russian Presidential Academy of National Economy and Public Administration (RANEPA)

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CONTENTS

INTRODUCTION

"Resource curse", "Dutch disease", "gold rush", "blood diamonds" – those are just some of the epithets used to characterise the role of natural resources in economic development. They certainly do not set a positive tone for a constructive discussion. The purpose of this report is to change that attitude and lay a foundation for a policy roadmap based on success stories of economic development among resource abundant countries. This report presents the argument that resource economies with better economic and political institutions are more capable of managing their resource revenues, and can achieve superior results in economic growth and social development.

To support that argument, we have used empirical evidence and analysed the relevant research that has been conducted on the subject to date. We compare performances of resource economies in different parts of the world depending on their institutional rankings, property structure of their extractive industries and other key parameters.

In the first section of the report we provide a brief overview of major studies of resource abundant economies. We compare various approaches to such major issues as the "Dutch disease" and effects of commodity price volatility. We argue that mineral exporting countries are by no means doomed to stagnation and suggest an alternative to the "resource curse" hypothesis by emphasising the positive role of the rule of law and strong property rights, and the negative role of rent-seeking which appears to be one of the main hindrances to economic development in resource rich countries.

The second section looks at policy choices facing resource economies. We examine such major policy areas as the institutional climate, government's share in oil companies, stabilisation funds, government investments, innovations and immigration policies. The most important conclusion from our analysis is that the economic and social performance of resource economies depends primarily on the strength of their institutional framework, of which economic freedom is the best measurement. We also suggest considering some alternative policy solutions for the longer term, such as a National Oil Dividend, which is modelled on the annual dividend paid from the Alaska Permanent Fund to every Alaskan resident.

In the third section we analyse and compare experiences of five resource abundant economies - Australia, Canada, Chile, Malaysia and Norway. We look at particular policies which allowed them to achieve rapid growth and higher levels of social development compared to peer countries with similar starting conditions.

In the final section we summarise the main findings of this report and suggest five practical steps towards higher efficiency of Russia's extractive industries and towards faster economic growth: a two-tier model for improving efficiency; a phased transition to a petroleum profit tax; establishing min-

eral special economic zones; diversifying natural gas exports; and introducing a National Oil Dividend.

Below are some of the main conclusions of the report in brief:

- Natural resources themselves are not the root of problems facing mineral-exporting economies. Our research shows it is possible to build a modern and prosperous economy which has a significant share of income from the sale of minerals.
- In resource-exporting countries with higher levels of economic freedom, both real per capita income and human development scores are higher, people live longer, there is more investment and more civil rights. Higher economic freedom correlates with lower crime, corruption and illiteracy levels.
- A mineral-exporting country can catch up in its economic development if it improves its level of economic freedom and strengthens its institutions. Even with relatively small improvements, the results are positive and quite significant.
- One of the main obstacles to economic growth and social development in many resource economies is rent-seeking. It is not a unique feature of resource-abundant countries, but it does appear to have a particularly strong effect on them and produce institutional weaknesses.
- Both the "Dutch disease" and the impact of commodity price volatility are first and foremost institutional rather than purely economic problems. Both of them become problems under specific circumstances, which are usually associated with the lack of strong and transparent institutions.
- Innovation is one of the key drivers of growth and social development. The "shale revolution" is in essence a technological breakthrough of the highest caliber which helped to undermine a common prejudice against extractive industries as being not sufficiently innovative.
- Private oil companies generally perform better than state-owned firms: the average net income per barrel of the nine largest privately-owned oil companies is more then double that of the nine largest state-owned oil companies.
- Under certain conditions, and within the right policy framework, some state corporations manage to achieve impressive results (examples include Norway's Statoil and Malaysia's Petronas). What matters is the way a particular company is organised, and, even more importantly, the overall institutional environment in which it operates.
- More government participation in resource economies does not increase growth. On balance, it is generating a negative return by crowding out private investment, fuelling rent-seeking and corruption, and decreasing overall productivity.

SECTION ONE: Challenges

Economic and institutional features of countries with a high share of natural resources exports.

1.1. The "resource curse" hypothesis. Pro et contra

A brief overview of major studies conducted to date. Key concepts and key positions in the debate about the role of resource rents

The phrase "the empire on which the sun never sets" was first used to describe the enormous dominion of Philip II of Spain in the XVI century. During his almost half-century rule, Spain's territory stretched into all known continents; a magnitude unprecedented in earlier European history. Reaching the zenith of its military and political might, Spain was also receiving very significant amounts of what today's economists would describe as "windfall profits". The court of Philip II was flooded with shipments of gold, silver and jewels from its colonies in the Americas. Despite that, "Philip the Prudent" (as he is, perhaps surprisingly, known in Spanish to this day) imprudently ran his government into bankruptcy four times during his reign. On the back of the inflow of precious metals and stones he took out increasingly large loans, the interest on which was so great that he could not pay it, even with the continued inflow of colonial shipments. The empire of Philip II therefore became the best known case of an economy falling victim to resource dependency.

Although some economists since the times of Philip II raised doubts about the role of natural resources in economic development, up until the late XX century there had been no significant efforts to study the possible negative impact of resource dependency. One of the possible reasons for that was the common sense view that a country's natural resources should positively effect its economic growth. Several authors

In the 90s, it seemed that most economists had reached a consensus about the existence of a "resource curse".

(e.g. Mikesell, 1997, Kronenberg, 2004) have argued that natural resources – notably coal as a source of energy – were among the primary drivers of the Industrial Revolution.

The first significant systematic study of economic problems associated with natural resources was published by Sachs and Warner (1995) under the title "Natural Resource Abundance and Economic Growth." That study laid the foundation for what later became know as the "resource curse" hypothesis. The main finding of the study was that economies with a high ratio of natural resource exports to GDP grew slower during a twenty year period from 1970 to 1990 than the world average. Even after accounting for a number of variables that are considered to correlate positively with economic growth, a negative relationship between economic growth and resource dependence was still evident. They also found that lowering the share of natural resources in overall exports by 10 percent causes an increase in growth of 1 percentage point. A number of economists conducted similar analysis to test their findings. For example, Sala-i-Martin (1997) published his paper, provocatively titled "I Just Ran Two Million Regressions", in which he confirmed the findings of Sachs and Warner. Sala-i-Martin identified 22 variables which had a statistically significant influence on economic growth – natural resources were one of those identified as having a negative effect.

In the years since Sachs and Warner published their paper, economic and analytical approaches to the issue of natural resources and economic growth have gone through various stages. **In the 90s, it seemed that most economists had reached a consensus about the existence of a "resource curse".** The phrase itself was coined by Richard Auty (1993), an economist who specialises in the influence of natural resources on economic development. But simply stating that mineral resources have a negative effect on growth was not sufficient. An explanation was needed. Hence several approaches emerged which emphasised various channels through which resource dependency hinders growth. The earliest explanations focused on economic channels. Sachs and Warner arrived at the conclusion that it was the effect of the "Dutch Disease" which had been studied by economists since the 1970s (McKinnon, 1976; Corden and Neary, 1982; Van Wijnbergen, 1984; Auty, 1994b; Gylfason et al., 1997). But in the 2000s, a group of authors (still within the economic channel approach) investigated the influence of commodity price volatility on growth and development. Publications by Cavalcanti et al. (2009 and 2011), van der Ploeg and Poelhekke (2010), Leong and Mohaddes (2010) all showed a negative impact of the former.

In recent years, as more rigorous econometric analysis has been conducted, using new, more extensive data sets, doubts about the "resource

curse" hypothesis have started to emerge. Several economists arrived at different conclusions concerning the effects of natural resources. First, there were doubts about the particular time period which Sachs and Warner chose to analyse. Manzano and Rigobon published a paper with the National Bureau of Economic Research (Manzano and Rigobon, 2001) which argued that in the historical period used by Sachs and Warner there was a significant commodity price drop starting in the 1980, which lasted for 20 years (this period is sometimes referred to as the "1980s oil glut"). This price decrease might have had a negative effect on economic growth. Furthermore, they argued that the high commodity prices of the 1970s allowed governments of resource-exporting countries to go on a borrowing spree which created a debt overhang that in turn further slowed down growth. After correcting for those factors, the "resource curse" was no longer identifiable.

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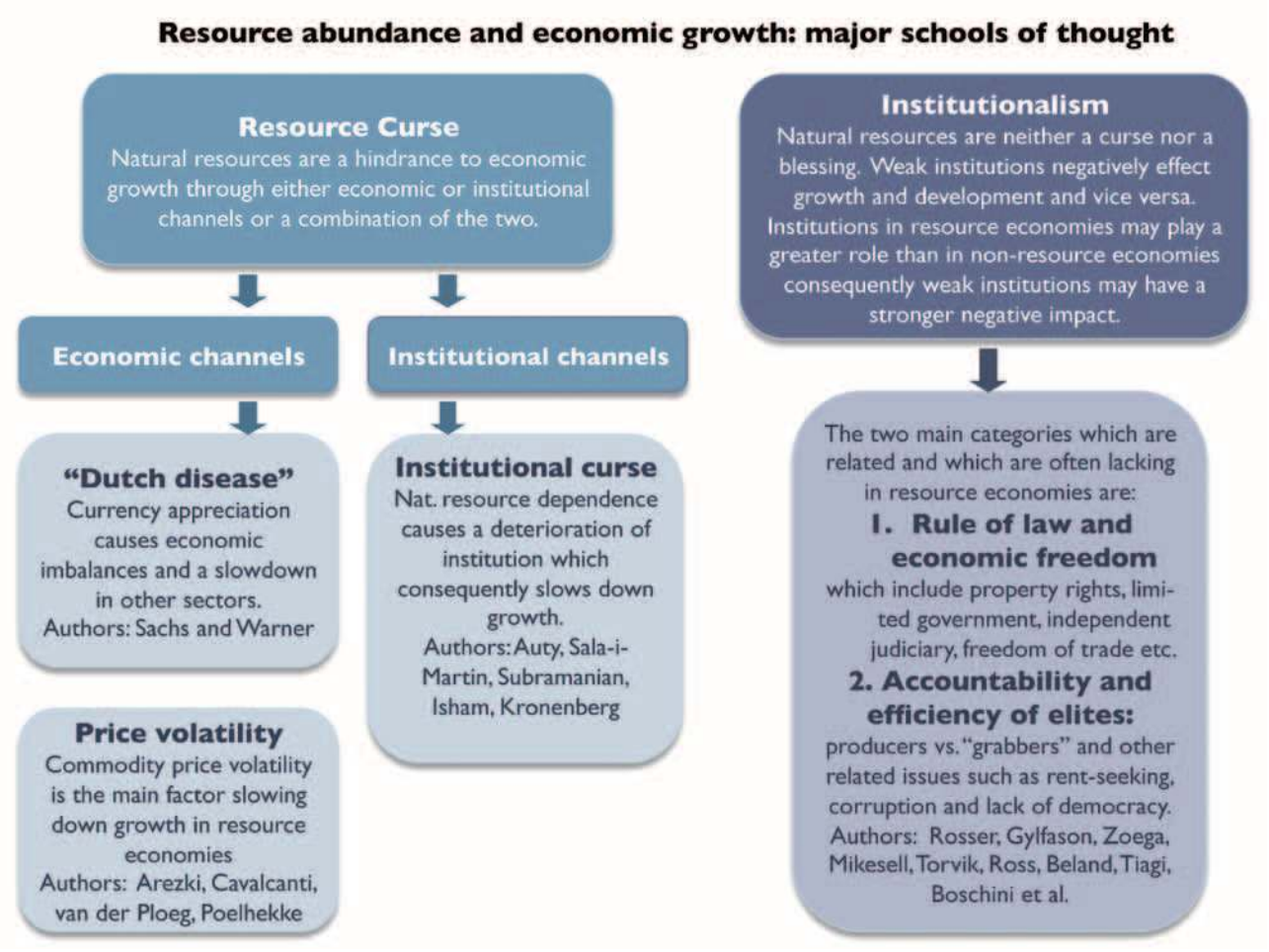
Two economists at the World Bank, Lederman and Maloney (2007, 2008) raised doubts over the very attempt to generalise about the impact of natural resource on growth and development. They suggested that some of the indicators used in previous analysis might be unrelated to relative natural resource endowments. After accounting for fixed effects in their analysis, the negative impact of resources disappeared, suggesting that it is not their



particular proxy, but rather the natural resources proxy's correlation with certain unobserved national characteristics that are influencing the result. They therefore concluded that economists have been trying to generalise about the effect of resource abundance while failing to discover precisely which characteristic is negatively effecting growth. A number of other economists looked at more extensive data sets covering longer periods of time and discovered either no influence (Stijns, 2005) or a very weak impact of natural resources on growth.

Doubts about the direct economic impact of resource abundance encouraged a number of authors to look for a hidden channel through which natural resources might impact development. While the macroeconomic explanation emphasised such issues as the "Dutch disease" and price volatility, an alternative approach developed, which considered institutional deficiencies as the main factor inhibiting growth in resource-abundant economies. It is important to stress the difference between the two schools of thought within the institutional approach. One stems from the "resource curse" hypothesis and sees natural resource abundance as a cause of institutional degradation and corruption within the ruling elite, which consequently effects growth and development. Essentially, the "resource curse" becomes an "institutional curse". The other school of thought, "institutionalism", also puts an emphasis on institutions, but the causality link works in the opposite direction: countries abundant in natural resources are not cursed to develop deficient institutions, but rather weak institutions are themselves the reason for the slow down in growth and development. To better represent various approaches to resource economics, we have developed a map that is depicted below. In the next chapter we will look at differences in institutionalist approaches to resource-driven development.

The "resource curse" vs. the institutionalist approach

The two schools of thought – the "resource curse" hypothesis, with an emphasis on the institutional channel for the "curse", and institutionalism, which considers weak institutions to be the primary issue – have a lot in common. Both stress the vital role of institutions. Yet the practical policy implications of the two approaches are distinctly different. It is easy to see why. For the former approach, natural resources are the problem, and hence the solution is essentially to decrease economic reliance on resource sales. For the latter approach, resources per se are not the issue, or at least, one could argue, not the main issue. A number of countries, as we will see later in this report, are examples of how a high proportion of natural resource exports can exist alongside a developed institutional framework. Thus institutions are seen to be the key factor determining the development trajectory of a resource-abundant country. Therefore policy recommendations are mostly aimed at improving the institutional framework.

The institutionalist approach, in our view, has certain practical and analytical advantages. It looks deeper into the root of the problem and it also provides a better foundation for long-lasting policies. As with any issue, however, nothing is black and white. Limiting oneself to a single school of thought is not a very practical position. While institutions are essential, that is not to say that natural resources per se do not matter. A balanced institutionalist position would be to say that although countries reliant on resources exports are not doomed to fail or stagnate, they may face certain difficulties in implementing pro-growth policies. Certain institutions in resource-abundant economies may play a greater role than in resource-poor economies, and consequently weak institutions may have a stronger negative effect. This subject will be discussed in more detail later in this report. It would therefore be more accurate to speak of a "resource influence" or "resource challenge" rather than a "resource curse".

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The reason why the institutional approach is starting to replace the "resource curse" hypothesis was well captured in the following passage:

> "A consensus is emerging that various political and social variables mediate the relationship between natural resource wealth and development outcomes. But rather than acknowledge that these variables are shaped by a range of historical and other factors in each case, scholars have tended to see them as determined by the natural resource base. Put differently, scholars have been asking the wrong question: rather than asking why natural resource wealth has fostered various political pathologies and in turn promoted poor development performance, they should have been asking what political and social factors enable some resource abundant countries to utilise their natural resources to promote development and prevent other resource abundant countries from doing the same." (Andrew Rosser, 2006)

The outcomes of analyses of resource abundant countries' performances vary significantly depending on the data used and the periods of time analysed. As a result, conclusions that different authors reach range between a negative effect (Sachs and Warner, Auty, Ross, Cavalcanti etc.) of resource abundance on growth to no significant effect (Stijns, 2005) and even a positive effect (Nunn, 2008; Brunnschweiler, 2008). Even with the latter two findings (either no effect or a positive effect) the conclusions may be somewhat ambiguous. Even if a specific author finds no correlation between resource abundance and growth (or perhaps a positive correlation), one may still draw different conclusions from such results. Let's assume a certain country discovers a valuable mineral resource and at some points starts to sell it in the global market where that mineral is sold at a high price. Given that such exports create a windfall profit (and in some cases it can be a very significant one), the common sense assumption would be to expect such a resource-abundant economy to perform significantly better than a resource-poor one.

The fact that empirical evidence, at least with some such countries, shows either no significant improvement or an insignificant positive im-

provement, is an indicator of certain systemic problems that these countries face. Thus, the worries of those who belong to the "resource curse" school of thought may be justified even if the superficial effects of resource abundance are mild. What would be considered a relatively good performance for a resource-poor country could be seen as underperformance for a country with significant resource wealth. Hence further analysis would be required to understand the reasons for such underperformance.

That raises another important question: what actually is resource abundance and which countries qualify as resource-rich? There are many possible answers to this question. The two most common measurements of resource abundance are: the ratio of natural resource exports to overall exports and the ratio of natural resource exports to GDP. For the purposes of this report we are using both criteria in the following way: a country is resource-dependent if over 25 % of its exports consist of natural resources and the ratio of natural resources exports to GDP is above 10 %. The former criterion is used by a number of authors and is consistent with the IMF definition of resource-dependent countries. The latter is added to ensure that countries with very low volumes of overall exports do not fall into the abundance category. The *Appendix* provides a full list of countries that we established as qualifying, based on IMF and United Nations (UNCTAD) data. For the purposes of our analysis we established two groups of countries: those dependent on exports of natural resources (namely mineral resources) which we hereafter refer to as "resource economies" and a narrower group of countries dependent on the exports of oil and gas specifically, which we call "oil and gas economies".

We should also note that when we use the term "natural resources" we refer to what is known as "point resources" – essentially raw and refined mineral commodities. A broader definition might include land, water basins and other such natural resources which we have not incorporated. Our definition, however, is consistent with most studies on the subject and includes two broad categories of minerals: mineral non-fuel and fuels. The former is comprised of non-ferrous metals, metalliferous ores, crude fertilisers and other minerals, including precious and semi-precious stones. The latter includes oil and oil products, natural gas and coal. The precise list of commodities included in the definition is based on the Standard International Trade Classification (SITC) and the database of merchandise exports developed by the United Nations Conference on Trade and Development (UNCTAD), which has the most detailed statistical database on global merchandise trade.

In the next two chapters we will look at both economic and institutional aspects of resource dependence. We will start with the "Dutch disease" and commodity price volatility and then turn to problems of rent-seeking, corruption and formation of elites. We will use empirical data and some of the findings of previous research to arrive at certain conclusions.

1.2. Economic effects of resource reliance

The "Dutch disease" and crowding out effects. Declining production in non-resource manufacturing

In the end of the 1950s, several significant offshore natural gas discoveries were made in the Netherlands. Gas exports had a strong economic effect, causing an appreciation of the Dutch guilder and a contraction in the non-extractive industries. This effect gave the name to the term "Dutch disease" which was coined in 1977 by The Economist. The "Dutch disease" was the first instance where this economic phenomenon was thoroughly studied (Corden and Neary, 1982; Corden, 1984; Gylfason 2001a; Stevens, 2003). To be more precise the "Dutch disease" is not just a single consequence of increased mineral exports but a series of several intertwined effects.

The impact of the oil or gas boom on the broader economy can be divided into three main effects: the "resource movement effect", the "spending effect" (both first described by Corden and Neary, 1982) and the "exchange rate effect". Let's assume that there is a small open economy with three major sectors: a manufacturing sector, a non-tradable (service) sector and a resource sector, which emerges quickly as a result of, say, a major oil discovery, causing a boom in oil exports. The "resource movement effect" produces a shift of labour and capital to the resource sector from the rest of the economy as profits and wages in the resource sector begin to rise. The "spending effect" occurs when, as a result of windfall earnings in the resource sector, demand for both tradable and non-tradable goods rises. However the effects on the two sectors are different. In the non-tradable sector, increased demand for services is met by an increase of supply and a consequent rise in both prices of non-tradables and wages in the non-tradable sector. But increased demand for tradable goods is met, not by an increase in demand for domestic manufacturing goods, but by increased imports. Here the "exchange rate effect" steps in. It occurs as a result of an increased inflow of foreign currency (US dollars in the case of oil exports) which causes domestic currency to appreciate. The appreciation of the real exchange rate of domestic currency has a double effect on the manufacturing sector: it suppresses demand for domestically manufactured goods, as imported goods become more affordable, and it decreases exports of manufactured goods as they also become less competitive in the international market as the relative value of domestic currency increases.

The "Dutch disease" is a well studied and well documented phenomenon. The fact that it exists and that there are certain mechanisms through which it effects a resource-exporting country's economy are agreed upon by almost all economists who study the issue. What is much less clear is whether it has any considerable negative effect on overall economic growth as such, on the one hand, and on social development, on the other. If it does

have a negative effect in either area, then it is important to determine how that effect, or effects, can be mitigated through certain policies. It is worth starting by clarifying one basic aspect of this discussion. There is a common confusion between two distinctively different questions. One is whether the "Dutch disease" changes labour and capital allocation in a resource economy and thus its very structure. From everything we know about the "Dutch disease", the answer to that question is positive. A different question, however, is whether these structural changes are negative and, more specifically, whether they have a negative effect on growth. Although it may appear to many people that the "Dutch disease" slows down economic growth, and is therefore an unambiguously negative phenomenon, some common sense analysis casts doubts over that conventional view.

In essence, the "Dutch disease" is an adjustment to a new economic situation which emerges as a result of increased commodity exports. Such economic adjustments happen in all open economies, not only in resource exporting ones, as a reaction to higher returns on both labour and capital in specific industries. A contraction in the manufacturing tradable sector is simply evidence of higher returns in other industries (extractive and non-tradable). Such shifts in economic equilibria occur constantly due to technological progress and global competition. A major business and/or technological innovation may shift the balance of labour and capital allocation if an economy gets a boost from developing a new export product, for example, a high-tech product which matches a certain trend in global technological development and thus rapidly increases international demand for it (Nokia's mobile phones in Finland come to mind as an example). Few would see this as a negative development. Yet, when a boom happens in the natural resources sector, it is received with a mixture of anxiety and suspicion. It is true that there is empirical evidence which points to cases of economic and institutional failure in resource-dependant countries. And the "Dutch disease" may exacerbate the state of such an economy through the channels described above. But that is different from saying that the "Dutch disease" is to blame for such misfortunes in the first place.

At the end of the day, from a macroeconomic point of view, an increase in income through the sale of natural resources accounts for a proportionate increase in GDP. Although it may, potentially, be accompanied by a contraction in non-resource manufacturing, that does not mean that GDP growth should suffer due to this reallocation of sources of income. It is, in fact, much more likely to increase. Furthermore, undermining the argument about the "Dutch disease" as a source of stagnation, in many resource abundant countries, "Dutch disease" effects are very limited because there is either a very small, or practically non-existent, manufacturing sector to start with, such that, by definition, no reallocation can occur. Nonetheless, countries with only resource and non-tradable sectors have experienced

slowdowns and even negative growth, for example, several Middle Eastern countries in the 1970s and 1980s (see Graph 2.2 on p. 48). In order to understand the nature of stagnation in some resource-abundant economies, one must seek a different explanation, which we explore later in the report.

Governments, in an attempt to "save" the contracting non-resource manufacturing sector, created subsidised dependent industries, which dragged their respective economies into an economic slowdown. Thus, what is initially marketed as a remedy for the "Dutch disease" often becomes a source of economic problems itself.

A number of economists, after investigating the issue, reached the conclusion that the effects of the "Dutch disease" were not the primary driver of resource-abundant countries' growth trajectories. For instance, Mikesell (1997) analysed the performance of a group of resource-exporting economies and concluded that for the majority of them the "Dutch disease" had no effect on their growth patterns. McMahon (1997) comes to similar findings in his study. Torvik (2001) argues that output and productivity can either increase or decrease in both tradable non-tradable sectors, depending on the structural and institutional characteristics of the economy. We tend to share the latter view. An open market economy with low entry barriers and minimal obstacles to businesses will adjust to both the "resource movement effect" and the "spending effect" of increased commodity exports, just as it adjusts to any other changes in its export structure.

We would thus argue that there are different ways to look at the "Dutch disease" issue. In a narrow sense, it is about the reallocation of resources between various sectors. To see it is a "disease" – a problem in and of itself – means to apply a certain value judgment and a preference towards a certain way of generating income, i.e. the non-resource tradable sector, usually concentrated in manufacturing. It then essentially becomes much more of a political than an economic issue. And this is indeed what happened in many resource-abundant countries. **Governments, in an attempt to "save" the contracting non-resource manufacturing sector, created subsidised dependent industries, which dragged their respective economies into an economic slowdown. Thus, what is initially marketed as a remedy for the "Dutch disease" often becomes a source of economic problems itself.**

The question then, is whether any corrective action is required for the "Dutch disease", and specifically for the "exchange rate effect"? There is no straightforward answer to this question. It depends on the degree of resource dependence, the size of the economy and its share in the production of a particular commodity on the world market. Furthermore, the "exchange rate effect" is not entirely negative either. It may make some exported goods less competitive but it does have the effect of making all imported goods more affordable. The net effect depends on a variety of factors which are specific to each individual economy. To prevent abrupt hikes of the nominal and real exchange rate of the domestic currency, it would be advisable for a government to have a mechanism in place to steri-

lise excess inflows of foreign currency by means of a stabilisation fund or another similar venture. That practice has been widely adopted throughout the world and has generally allowed governments to keep a lid on the exchange rate of their respective currencies, as well as save money for a rainy day, when commodity prices go down.

One additional effect of the "Dutch disease" is its impact on the labour market. We will discuss some of the issues related to resource reliance, labour mobility and migration in the second section of this report.

The economic influence of commodity price volatility

Given the abovementioned doubts about the unavoidably negative influence of the "Dutch disease", several economists sought an alternative economic channel which could have a negative effect on some resource dependant countries. That led to the emergence of a new school of thought which can be described as the "volatility curse" hypothesis. The main idea is that it is not resource dependence per se which is a problem, but rather the volatility of mineral (and other primary) commodity prices in the global market. Observation of the harmful effects of commodity price volatility was one of the outcomes of broader research into resource economics in the 1990s. Mikesell (1997) found that economies with a high proportion of natural resource exports over the period of two decades, between 1972 and 1992, experienced an overall trade volatility three times greater than non-resource economies. Mikesell (1997) and Auty (1998) suggested that revenue volatility may be one of the major causes of economic slowdowns in resource economies. Other studies were published later focusing specifically on the price volatility effect: Brunnschweiler and Bulte (2008), Cavalcanti et al. (2009 and 2011), van der Ploeg and Poelhekke (2009 and 2010), Arezki and Nabli (2012).

For example, regression analyses conducted by Cavalcanti et al. (2011) showed that, for 62 primary commodity-exporting countries, price booms themselves had a positive impact on GDP growth. However, volatility of prices and consequent volatility of export earnings effected it negatively. Interestingly, for the remaining resource-poor countries, volatility of commodity prices did not have any effect on their total factor productivity, investment patterns or GDP growth. Given that resource-poor countries are still consuming natural resources, and thus are also affected by price volatility as consumers and importers of oil, gas and other minerals, the findings of Cavalcanti et al. suggest that price volatility can harm growth only at a sufficiently high level of economic dependency on income from a certain export product.

If we abstract from (often contradictory) econometric studies, and try to apply simple logic, the price volatility hypothesis seems to make somewhat more sense than the "Dutch disease". The "Dutch disease" hypothesis essentially argues that high incomes from the sale of natural resourc-

es, through several channels, harm growth instead of accelerating it. But common sense would lead us to the opposite conclusion: extra income generates extra growth. And many, though not all, economic regressions demonstrate exactly that. The price volatility hypothesis builds a different argument: it argues that reliance on primary commodity exports harms growth through the external volatility of prices. Such fluctuations do not allow the economy and its main players, both private and public, to adjust, and thus impede innovation, investment and development. Volatility harms fiscal policies and public spending in particular, as the government is left with less money to spend at times of low prices. That all seems to make more sense, but we see several problems with that argument.

Throughout history, several mechanisms have developed to mitigate price volatility, such as hedging through various financial instruments, insurance, scenario analysis, corporate planning and cost reductions.

First of all, exactly as with the "Dutch disease", it is difficult to see how natural resources differ from other commodities traded in an open international market. Some degree of volatility is inherent in the very nature of all commodity prices, or indeed any prices in a free market. So arguing that volatility harms GDP growth would thereby be equivalent to saying that markets impede economic growth. But both theory and practice tell us the exact opposite: a lack of markets destroys growth. The more sophisticated argument is that only a sufficiently high degree of price volatility, often seen in natural resources, is distractive. One might think that this qualification would save the hypothesis, but there are still problems with that argument too. Firstly, there are a lot of goods, such as certain consumer goods, medicines and high tech devices, which are subject to intense price volatility. Nonetheless, we never hear about a "consumer electronics price volatility curse". Secondly, while looking at macroeconomic phenomena, economists often fail to compare their findings with microeconomic developments, which are intrinsically linked to the former. If it is to be believed that price volatility is the source of trouble for economic growth in general, then that implies that firms which are most exposed to that volatility, i.e. companies in extractive industries, refining, petrochemicals etc., would be effected by this harmful volatility to an even greater extent. Oil companies, for example, suffer from a 100 % exposure to oil price volatility, while governments of oil producing countries are only exposed to it to the degree to which their budgets are dependent on oil incomes (this can be higher or lower, but only in a handful of countries does it come close to 100 %). However, from practical experience, oil companies do not suffer from the same fluctuations due to price volatility as government budgets do.

Throughout history, several mechanisms have developed to mitigate price volatility, such as hedging through various financial instruments, insurance, scenario analysis, corporate planning and cost reductions. Using

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all of the above instruments, and more, in a competent and strategic manner, could be generally described as efficient management. It is precisely this efficient management which allows some businesses to thrive under price volatility. And it is the lack of it which makes other businesses go under. Price fluctuations are just one of the many risks that any business has to take into account and manage. All of that seems to be self-evident when applied to businesses, but somehow changes entirely when economists look at countries and, particularly, at their governments. Then volatility suddenly changes from a risk into a "curse". In that sense, the price volatility hypothesis is not fundamentally different from the "Dutch disease" or any other similar approach which essentially falls into the "resource curse" paradigm.

The basic argument, which we will explore in the following chapters, is that **instead of fighting various "curses" and "diseases", governments would do a much better job by looking inwards and analysing their own performance, along with the shape and role of the institutions that they create, maintain and occasionally destroy.** It would also be helpful to compare public administration tools with those already successfully employed by companies (for example, those for managing price volatility). Various governments have done exactly that by creating stabilisation funds and other similar outfits. In that sense, **both the "Dutch disease" and the impact of commodity price volatility are essentially institutional rather than purely economic problems. Both of them become problems under specific circumstances, which are usually associated with the lack of certain institutions.** That is something that we will discuss in the following chapter.

Raymond Mikesell, a professor from the University of Oregon who studies resource economics, successfully captured the role of price volatility and the effects of the "Dutch disease" in resource reliant economies in the following extract:

> "A legitimate question is whether the shocks caused by primary commodity export booms are more serious than the shocks experienced by resource poor countries. Perhaps they are, but they can be handled by adopting appropriate policies." (Mikesell, 1997).

1.3. Institutional effects of resource reliance

Rent seeking, corruption and elites in resource economies

As previously mentioned, while countries reliant on resource exports are not doomed to fail or stagnate, they may face certain difficulties in implementing pro-growth policies. Certain institutions in resource economies may play a greater role than in non-resource economies. Consequently, weak institu-

tions may have a stronger negative effect. That essentially is the core argument for replacing the "resource curse" approach with a "resource challenge" one.

Both the "Dutch disease" and the impact of commodity price volatility are essentially institutional rather than purely economic problems. Both of them become problems under specific circumstances, which are usually associated with the lack of certain institutions.

There are various examples worldwide which illustrate the negative influence that institutional deficiency can have in resource economies. One of the most notable cases is that of **Venezuela**. Venezuela's economy is remarkable in several ways. In terms of its real GDP per capita, Venezuela went from being one of the most well-off countries in Latin America and worldwide in the 1950s, to a period of stagnation and even decline. Over two decades, between 1980 and 2002, its real income per capita declined by 25 %. In 1988, 2.4 % of Venezuelans were living below the poverty line. But by 1998, when Chavez was elected president, this had risen to 18.5 % (Gruben, 2004). Venezuela is largely reliant on oil exports, and its current combined reserves of oil and gas are the world's second largest (after that of Iran), which is about a dozen times more than what Venezuela had at its disposal in the 1980s. An oil-abundant and oil-dependent autocratic government may not concern itself with the income per capita, poverty, inequality and other indicators of well-being of its general population, but one would imagine that it would at least maintain oil production in order to fill government coffers. But Venezuela's example refutes even that intuitive assumption. It is hard to believe, but Venezuela's overall oil production is actually lower today than it was half a century ago! (See BP Statistical Review of World Energy and Graphs 3.6 on p. 64 and Graphs 3.8 on p. 65.)

Venezuela is not the only country which has failed to realise its hydrocarbon potential. **Iran** is another peculiar case. It possesses the largest combined oil and gas reserves in the world and is second in natural gas reserves only to Russia. It could clearly have been a frontrunner in natural gas exports with a booming economy. But in reality, while sitting on enormous reserves, it is actually a net gas importer! There must be something wrong with a country's institutions and policies if even its own petroleum industry, a government cash cow, can go into stagnation. The list of resource economies with the most evident institutional failures includes such countries as **Nigeria, Libya, Algeria, Yemen** and **Myanmar (Burma).** An American scholar, Terry Lynn Karl, spent two decades studying the experience of rentier petro-states. The results of that research are contained in her book, titled "The Paradox of Plenty: Oil Booms and Petrostates" (Karl, 1997). In this book, she identifies certain patterns of institutional decline which are similar across petro-economies (Graph 3.10 on p. 65 shows some examples of such countries).

One of the main patterns of many petro-states is rent-seeking. It is certainly not a unique feature of petro-states, but it does appear to have a particularly strong effect on them and to cause institutional weaknesses. It is important to note that rent-seeking is not just corruption through bribery. Although the latter is very often part of rent-seeking, it is helpful

One of the main patterns of many petro-states is rent-seeking. It is certainly not a unique feature of petro-states, but it does appear to have a particularly strong effect on them and to cause institutional weaknesses.

to distinguish between illegal and legal rent-seeking activities. Corruption and bribery are in the first category while the second one includes a broad range of activities, such as creating regulatory barriers to entry, ring-fencing mineral licenses for a certain group, or channeling state subsidies.

We should also note that official data (such as World Bank, IMF or statistical reports of national governments) on the share of mineral industries in a country's GDP does not represent the full amount of resource rents generated by the sale of minerals. It does not account for a large portion of hidden formal and informal transfers which are channeled into various parts of the economy, such as subsidies to other sectors through capped domestic energy prices and official and unofficial rent payments to various groups in the society. For a discussion on the structure and size of resource rents see the study by Clifford G. Gaddy and Barry W. Ickes which was published in "The Oxford Handbook of the Russian Economy" (Alexeev and Weber, 2013). For example, they estimate the size of the overall oil and gas rent in **Russia** to be no less than 33 percent of GDP, while the official share of the hydrocarbon industry to GDP stands at about 11 percent. Most of the rent-seeking is usually taking place in that shadow portion of rents which are not included in official statistics.

Several reasons can be found for why resource economies are vulnerable to rent-seeking. The four most important reasons, in our view, are:

1. **Immobility in the ground.** A specific feature of extractive industries is their intrinsic dependence on mineral resources which are immovable while they remain under the earth's cover. As a result, effective government control is much higher than in other sectors. Globalisation has allowed companies to choose jurisdictions in both the manufacturing and the service industries, taking their offices, production lines and call centers where conditions are best. In contrast, a company cannot relocate a mine or an oil well. Businesses have a limited choice of location before the start of operations. Once investments are made and drilling or digging has started, there is no such choice. This gives bureaucrats much more control. An additional characteristic of natural resources which allows higher levels of control is the fact that they can be easily accumulated in one place, concentrated through refining and stored for long periods of time.
2. **Resource nationalism.** Resources in the ground are state-owned by default which creates a strong bias towards government down the entire chain of mineral extraction, refining and distribution. This paradigm is often referred to as "resource nationalism". In practically all countries (with the exception of the USA and very limited cases

in Canada) natural resources underneath the earth are the property of the state. They are often called "property of the people", but that does not change their actual status, which is essentially government ownership. Consequently, any business activity related to minerals is tightly controlled by the government, which generates vast opportunities for extorting rents.

3. **Redistribution through big government.** Extractive industries employ a small percentage of the population but often generate a lion's share of gross national income. Thus redistribution in its many forms (transfers, subsidies to the non-resource sector, large scale state-run infrastructure projects, privileges etc.) constitutes a very significant function of a rentier state. One of the key rent-seeking activities is capturing such transfers to satisfy private interests. High levels of redistribution tend to increase both the intrusiveness of the state and the size of government spending as a share of GDP. That is often supplemented by economies of scale for rent-seeking that emerge in large petro-states operating massive budgets. In such countries, even a minor position in the rent-seeking hierarchy can generate very significant returns.
4. **Insulation of the elite.** For reasons mentioned above, rents from natural resources are easily extractable and thus can greatly enhance the wealth of the ruling elite. A portion of those profits are also redistributed among the rest of the population. Consequently, for a period of time, dissatisfaction among the population with the status quo of an irremovable rentier elite may be stifled by means of creating dependency on various government transfers. That develops into a vicious cycle of rent-seeking, which pervades the society from top to bottom, and does so in a very unequal measure. Rents from natural resources can be used either as carrots – through transfers – to buy loyalty, or as sticks if discontent persists and develops into political protest. Thus many petro-states spend a very significant part of their budgets on police, army and intelligence.

Producers vs. "grabbers". Rent seeking and economic growth

A number of authors have explored the phenomenon of rent-seeking including Tornell and Lane (1999), Ross (1999), Auty (2001, 2005), Gylfason (2001), Easterly and Levine (2002) and Torvik (2002). In 2006, Halvor Mehlum, Karl Moene and Ragnar Torvik published a paper titled *"Cursed by Resources or Institutions?"* that suggested an analytical model for examining which economic forces are at play in resource economies (Mehlum et al., 2006). They also went one step further and looked at why some countries are negatively effected by rent-seeking and some are not. While our analysis above helps to explain why rent-seeking is so common in resource economies, the model of Mehlum, Moene and Torvik suggests an explana-

tion of how rent-seeking can influence economic growth under different institutional conditions.

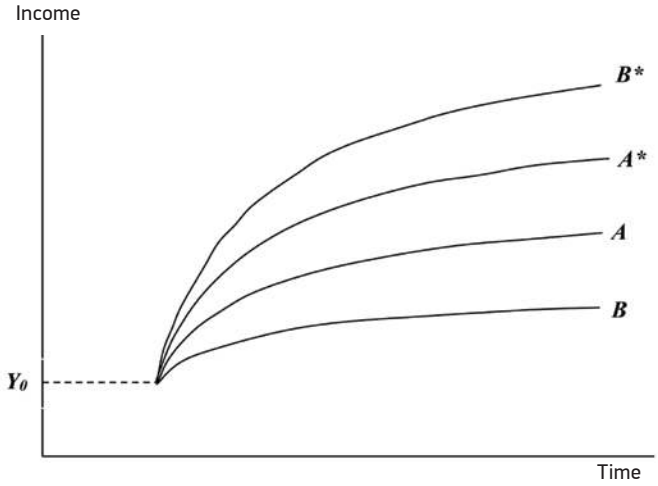
They begin by establishing the distinction between production and special forms of rent-seeking. They argue that all forms of rent-seeking can be harmful to economic development, but not to the same degree. The productive economy and rent-seeking can be either complementary or competing, and it is the latter which is more harmful to growth and development. Rent-seeking competes with production when institutional quality is poor. The authors provide some illustrations:

> "Dysfunctional democracies invite political rent appropriation; low transparency invites bureaucratic corruption; weak protection of property rights invites shady dealings, unfair takeovers and expropriation; weak protection of citizens' rights invites fraud and venal practices; weak rule of law invites crime, extortions and mafia activities; a weak state invites warlordism." (Mehlum et al., 2006: p. 1122).

Mehlum, Moene and Torvik call that most harmful type of rent-seeking "grabbing" and institutions which increase returns on such rent-seeking – "grabber-friendly". The better the quality of institutions, the less profitable it is to be engaged in grabbing and the more profitable it is to be engaged in production. They then go on to establish two possible frameworks: a resource economy with grabber-friendly institutions, and one with producer-friendly institutions. Let us imagine that in both of those economies a major new discovery of oil is made, which swiftly increases income from oil exports. In an economy with grabber-friendly institutions, resource income provides a new source of income for grabbers, bringing their profits up while producers' profits remain unchanged. As a result, there are fewer producers, more grabbers and lower income for all. That is exactly the situation which is described as "the paradox of plenty", when higher resource income reduces total income. Under grabber-friendly institutions the sequence of developments is as follows: high resource rents pull entrepreneurs into grabbing. That causes profits in production to go down, which in turn pushes even more entrepreneurs into grabbing. Grabbers generate negative externalities and producers – positive externalities. This explains why the negative income effect from this reallocation of entrepreneurs dominates the direct positive income effect of more resources.

In an economy with producer-friendly institutions, increased receipts from the sale of natural resources provide an additional source of income for producers and consequently shift production profits upwards. As a result, there are more producers and fewer grabbers. Furthermore, in a producer-friendly system, increased income from natural resources stimulates overall production. It produces a boost to overall incomes which is higher than the incremental increase from the sale of minerals alone. That happens because there are positive complementarities between various producers. Thus, in the Mehlum, Moene and Torvik model, there is a multiplier effect in resource

Growth paths of resource-rich and resource-poor economies according to the Mehlum, Moene and Torvik model (Mehlum et al., 2006)



economies, such that both positive and negative tendencies get amplified. In essence: "With producer-friendly institutions natural resources stimulate production. With grabber-friendly institutions natural resources hamper production." (Mehlum et al., 2006).

Mehlum, Moene and Torvik suggest the following visual representation of patterns of growth in different economies (see illustration below). They compare four hypothetical countries. Resource-poor countries A and A*, where country A has grabber-friendly institutions and country A* has producer-friendly institutions. And resource-rich countries B and B*, where country B has grabber-friendly institutions and country B* has producer-friendly institutions. The four countries have initially the same income level Y0. The country with producer-friendly institutions A* grows faster than the country with grabber-friendly institutions, A. And, similarly, country B* has a higher growth rate than country B. One of the main features of this model is that resource-rich economies with producer-friendly institutions outperform resource-poor countries with producer-friendly institutions (B* and A* respectively) while among grabber-friendly countries it is the other way round: resource-abundant economies (B) end up lagging behind all other groups. Hence the main conclusion of Mehlum, Moene and Torvik is that **the quality of institutions determines whether natural resource abundance is a blessing or a curse.**

In order to illustrate the performance of different resource economies depending on their institutional development, we grouped them in accordance with their score in the global ratings. We then took the three most frequently quoted indices, deliberately using three different indices, in order to assess the effect of institutional quality as measured by different research institutions. The three indices we used were:

- The Fraser Institute Economic Freedom of the World report;

The quality of institutions determines whether natural resource abundance is a blessing or a curse.

In all groups, and for almost all parameters, there is a visible trend. That trend confirms our previous hypothesis: a better institutional environment in resource countries produces higher income per capita, higher living standards and more social development.

- The World Bank's "Doing Business" report;
- The Global Competitiveness Report of the World Economic Forum.

For purposes of analysis we established two groups of countries: those dependent on exports of natural resources (namely mineral resources) which we refer to as "resource economies" and a narrower group of countries dependent on the exports of oil and gas which we call "oil and gas economies". Altogether there are 68 resource economies and 39 oil and gas economies in our list. The Appendix provides a full list of countries that we established based on IMF and United Nations (UNCTAD) data as well as groups of countries according to their scores in the three ratings mentioned above.

We divide resource and oil and gas economies into four quartiles in accordance with their performance in the above-mentioned indices. We then compare the performance of those quartiles using eight parameters as measurements of economic and social development. Those eight parameters are:

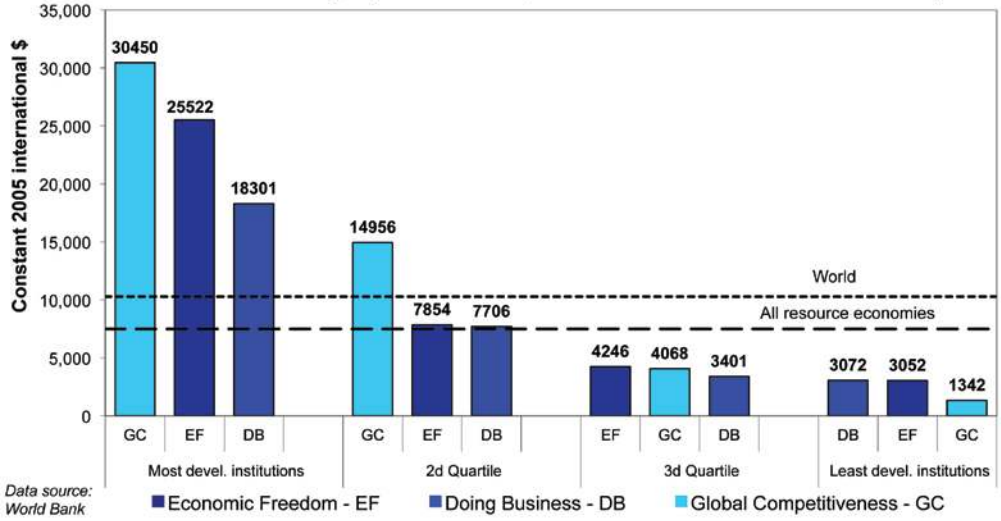
1. Real GDP per capita (purchasing power parity – PPP); source – World Bank
2. Foreign direct investment; source – World Bank
3. Human Development Index (HDI); source – United Nations Development Programme (UNDP)
4. Life expectancy; source – World Bank
5. Literacy rate; source – World Bank
6. Freedom from corruption; source – Transparency International (higher rating – less corruption)
7. Homicide rate; source – UNODC
8. Violations of civil liberties rating; source – Freedom House (higher rating – more violations)

As mentioned, the above parameters were analysed for two groups of countries: resource economies and oil and gas economies. For each of those two groups we looked at the most recent available data, as well as historical trends from the earliest available date that represent changes in that parameter for the group. A selection of graphs that represent our findings can be found below in the Illustrations for Section 1 (Graphs 1.1–1.15 on pp. 23–27).

The results of our comparisons speak for themselves. **In all groups, and for almost all parameters, there is a visible trend. That trend confirms our previous hypothesis: a better institutional environment in resource countries produces higher income per capita, higher living standards and more social development.** Comparing groups with the most developed institutions (the first quartile) with the world average also demonstrates that development levels in resource countries with strong institutions are greater than that of the world average.

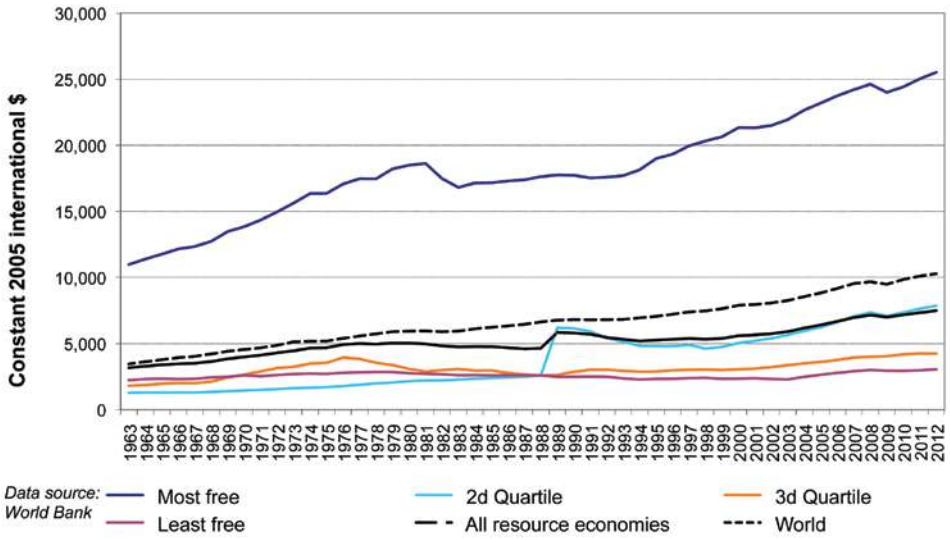
In the next chapter we will look at specific policies and structural features that promote more efficient institutions and faster economic growth.

Real GDP per capita (PPP) in resource economies, 2012
Countries grouped according to their rankings in three reports measuring institutional strength (Fraser Institute, World Bank and World Economic Forum)



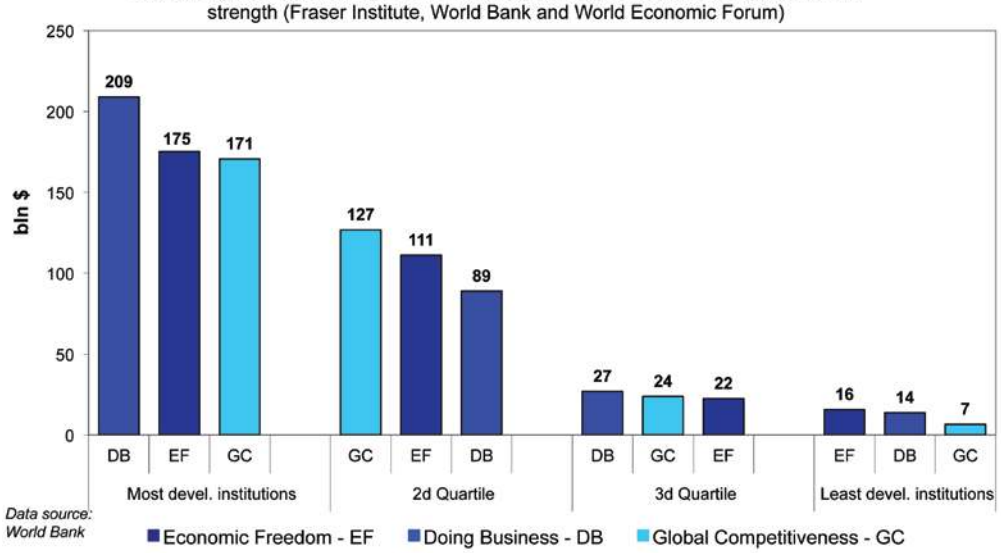
Graph 1.1

Real GDP per capita (PPP) in resource economies since 1963
Countries grouped according to their rating in the Economic Freedom of the World report

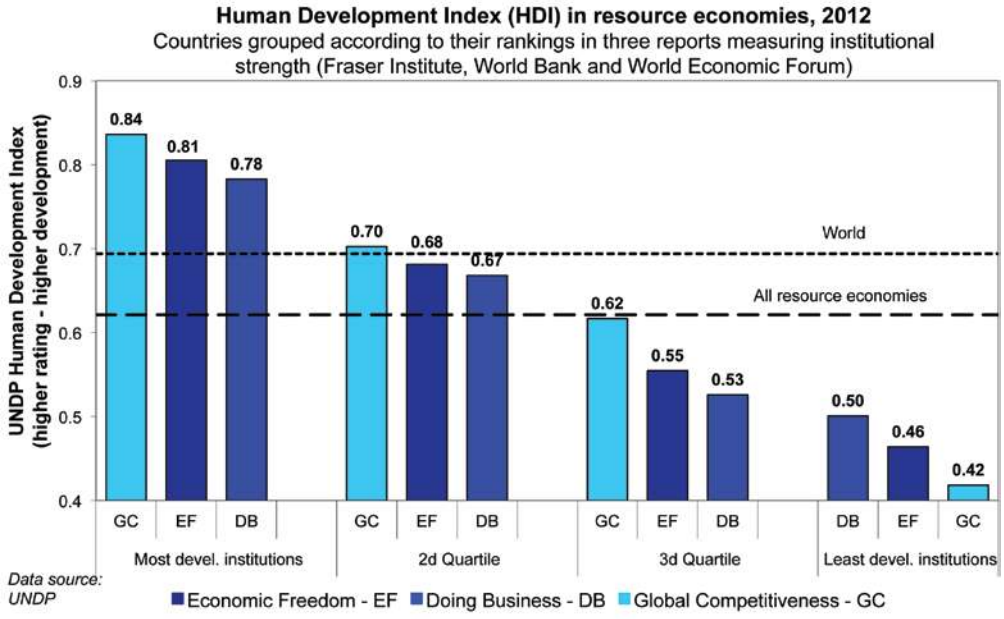


Graph 1.2

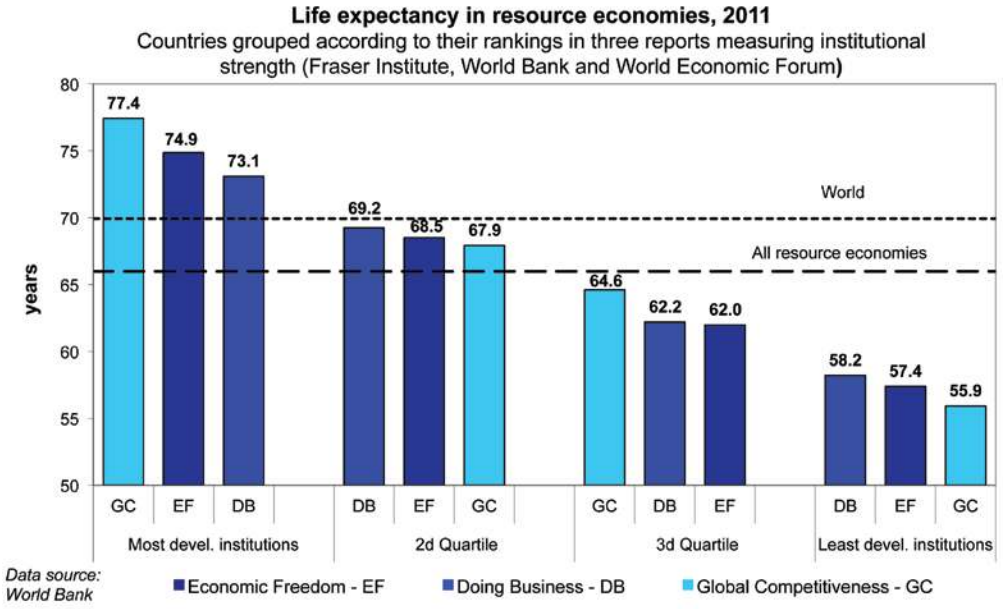
Foreign direct investment in resource economies, 2011
Countries grouped according to their rankings in three reports measuring institutional strength (Fraser Institute, World Bank and World Economic Forum)



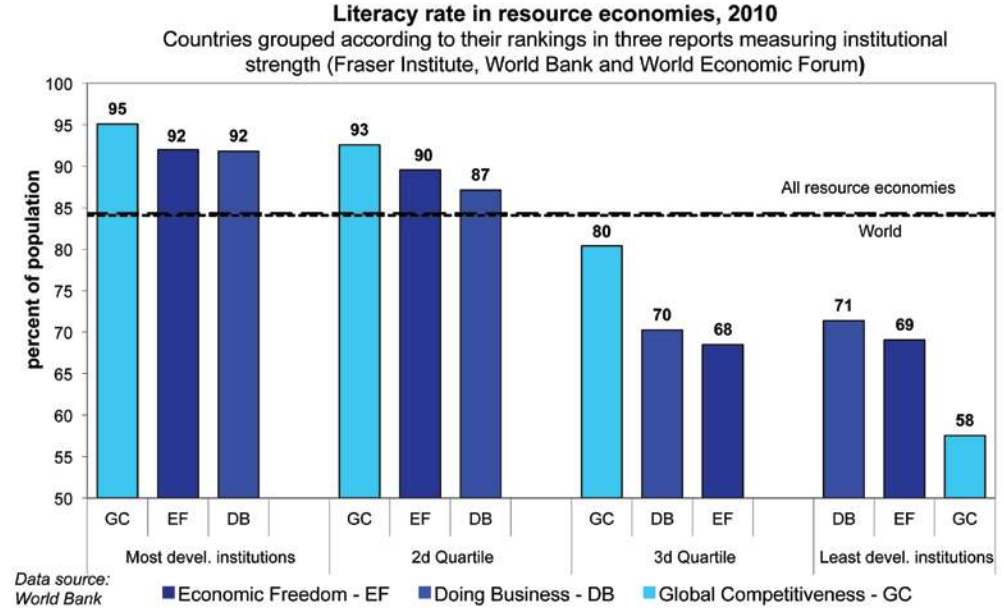
Graph 1.3



Graph 1.4



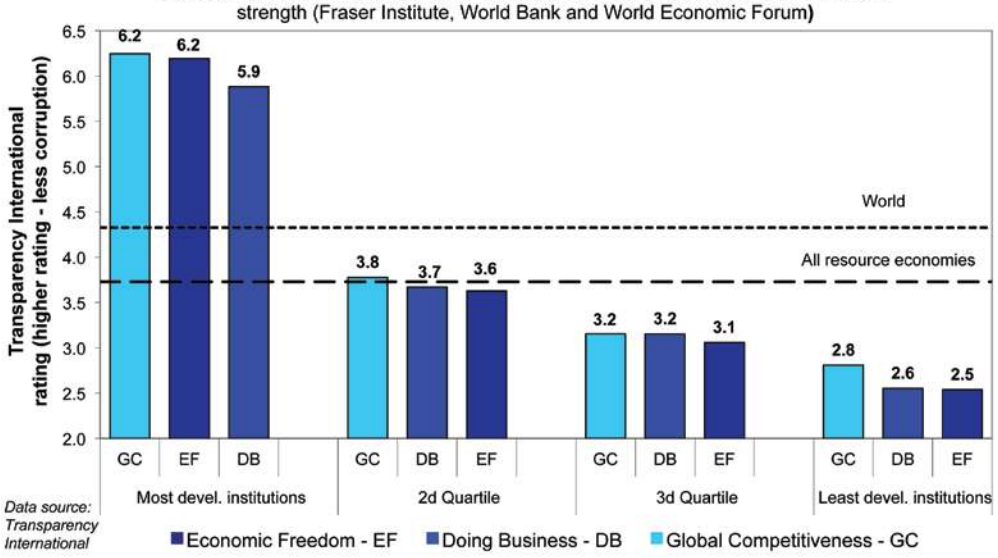
Graph 1.5



Graph 1.6

Freedom from corruption in resource economies, 2012

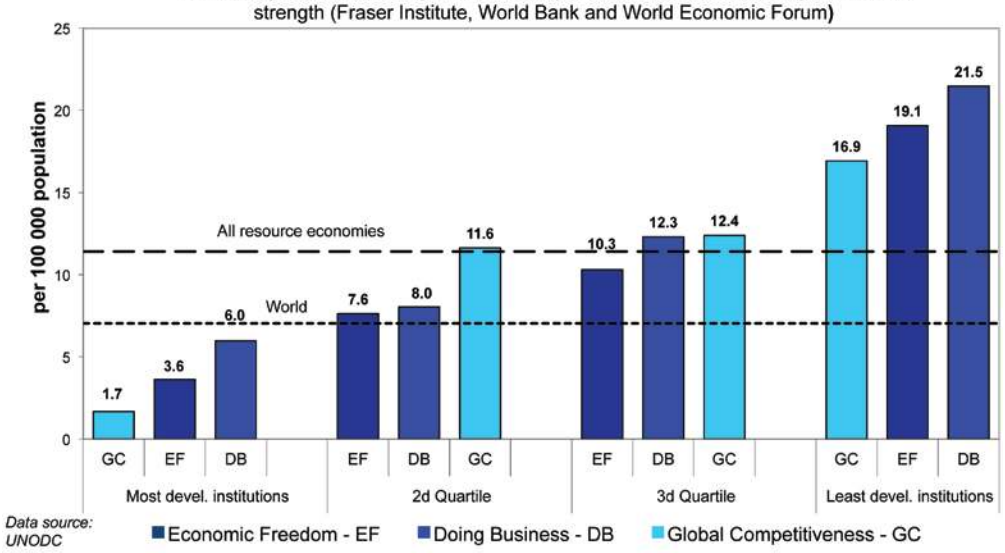
Countries grouped according to their rankings in three reports measuring institutional strength (Fraser Institute, World Bank and World Economic Forum)



Graph 1.7

Homicide rate in resource economies, 2008

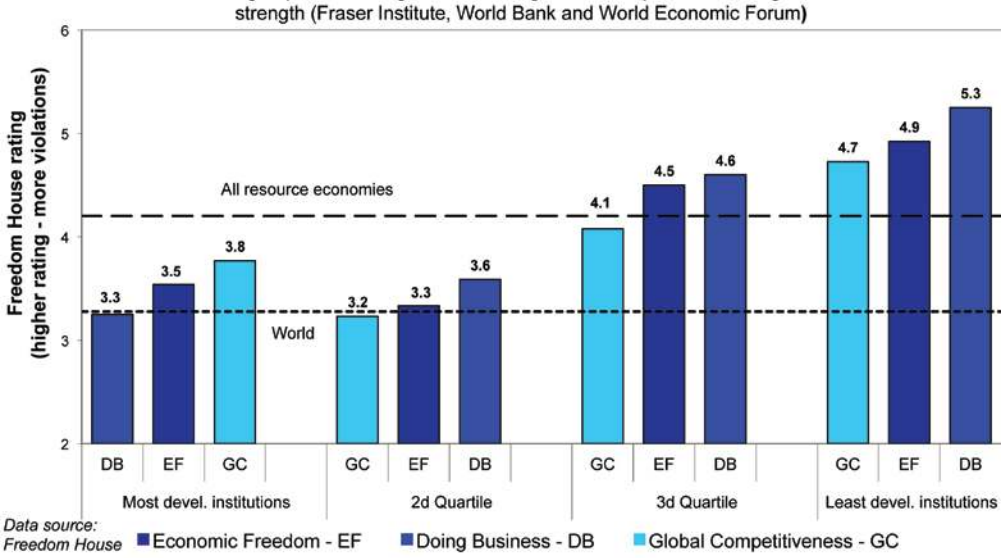
Countries grouped according to their rankings in three reports measuring institutional strength (Fraser Institute, World Bank and World Economic Forum)



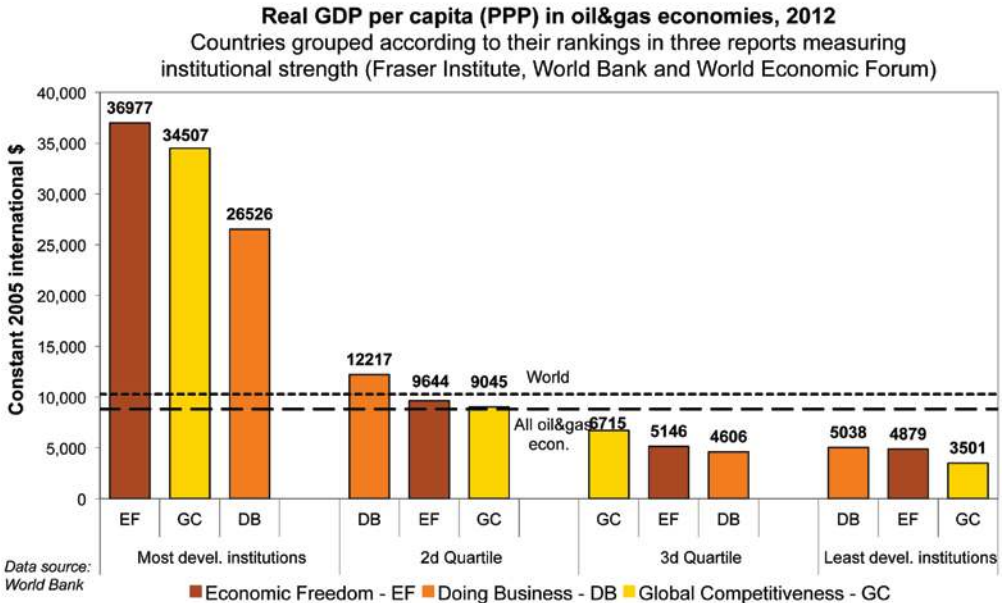
Graph 1.8

Violations of civil liberties in resource economies, 2012

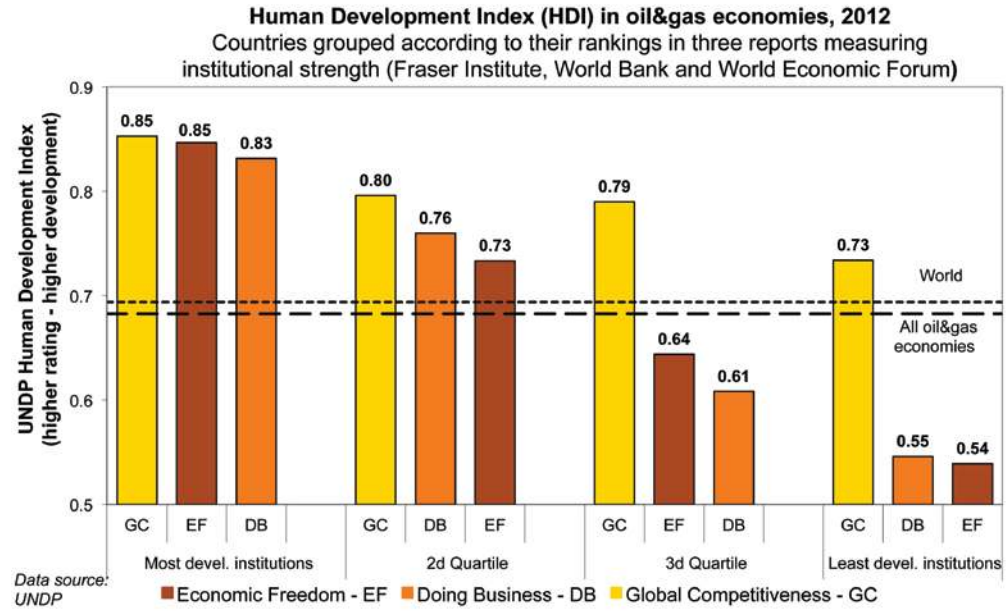
Countries grouped according to their rankings in three reports measuring institutional strength (Fraser Institute, World Bank and World Economic Forum)



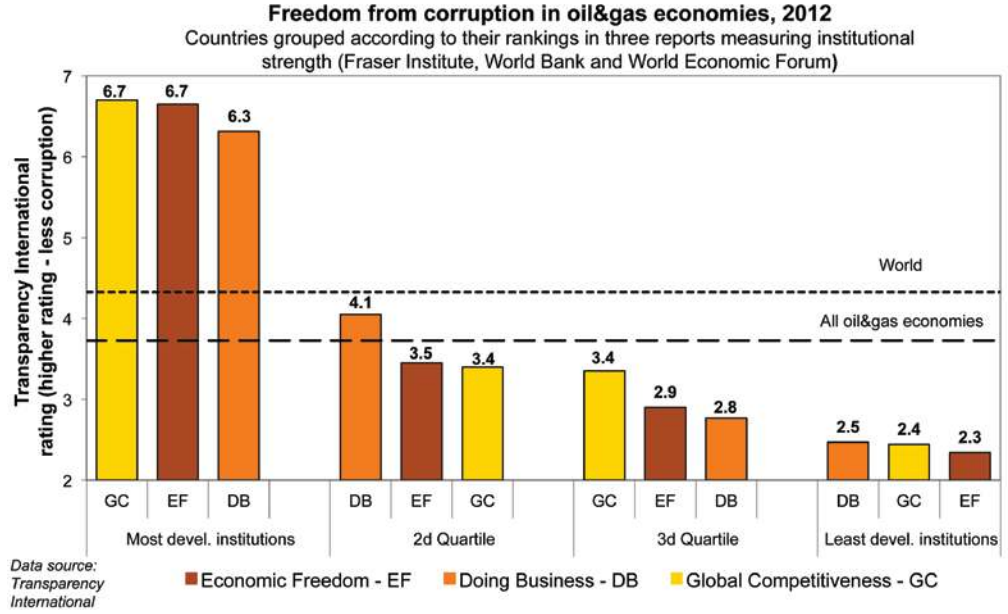
Graph 1.9



Graph 1.10

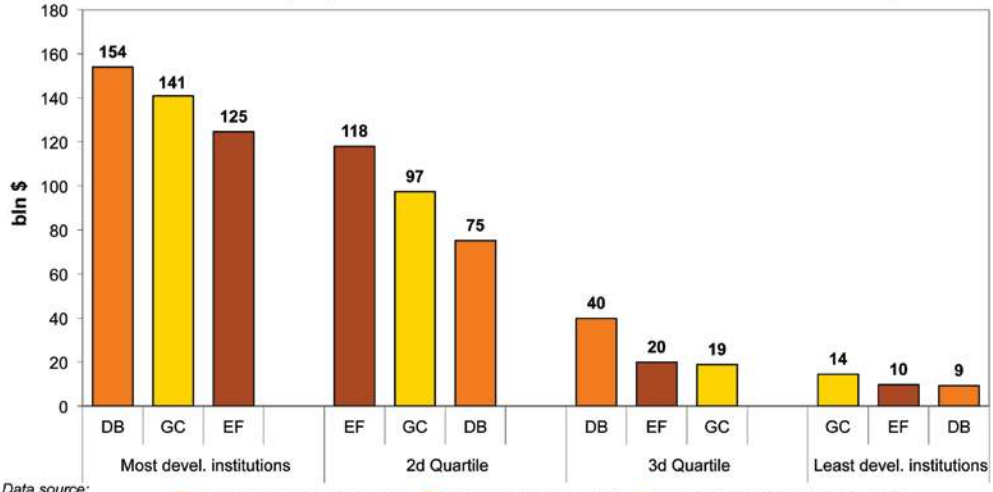


Graph 1.11



Graph 1.12

Foreign direct investment in oil&gas economies, 2011
Countries grouped according to their rankings in three reports measuring institutional strength (Fraser Institute, World Bank and World Economic Forum)

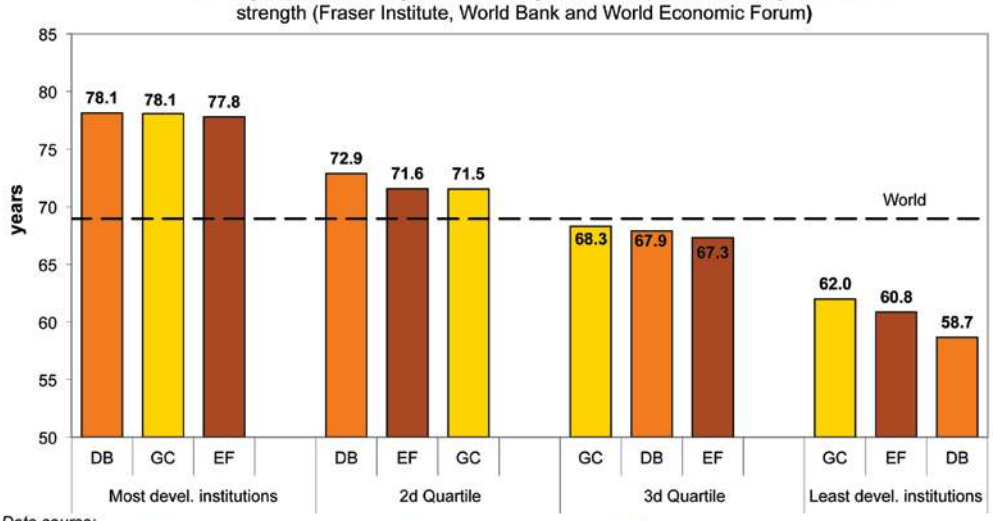


Data source: World Bank

Economic Freedom - EF Doing Business - DB Global Competitiveness - GC

Graph 1.13

Life expectancy in oil&gas economies, 2011
Countries grouped according to their rankings in three reports measuring institutional strength (Fraser Institute, World Bank and World Economic Forum)

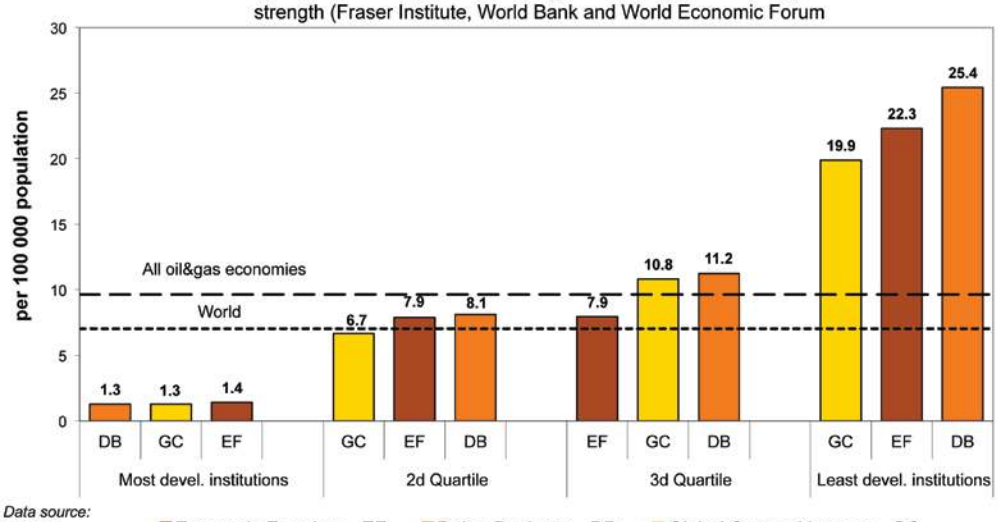


Data source: World Bank

Economic Freedom - EF Doing Business - DB Global Competitiveness - GC

Graph 1.14

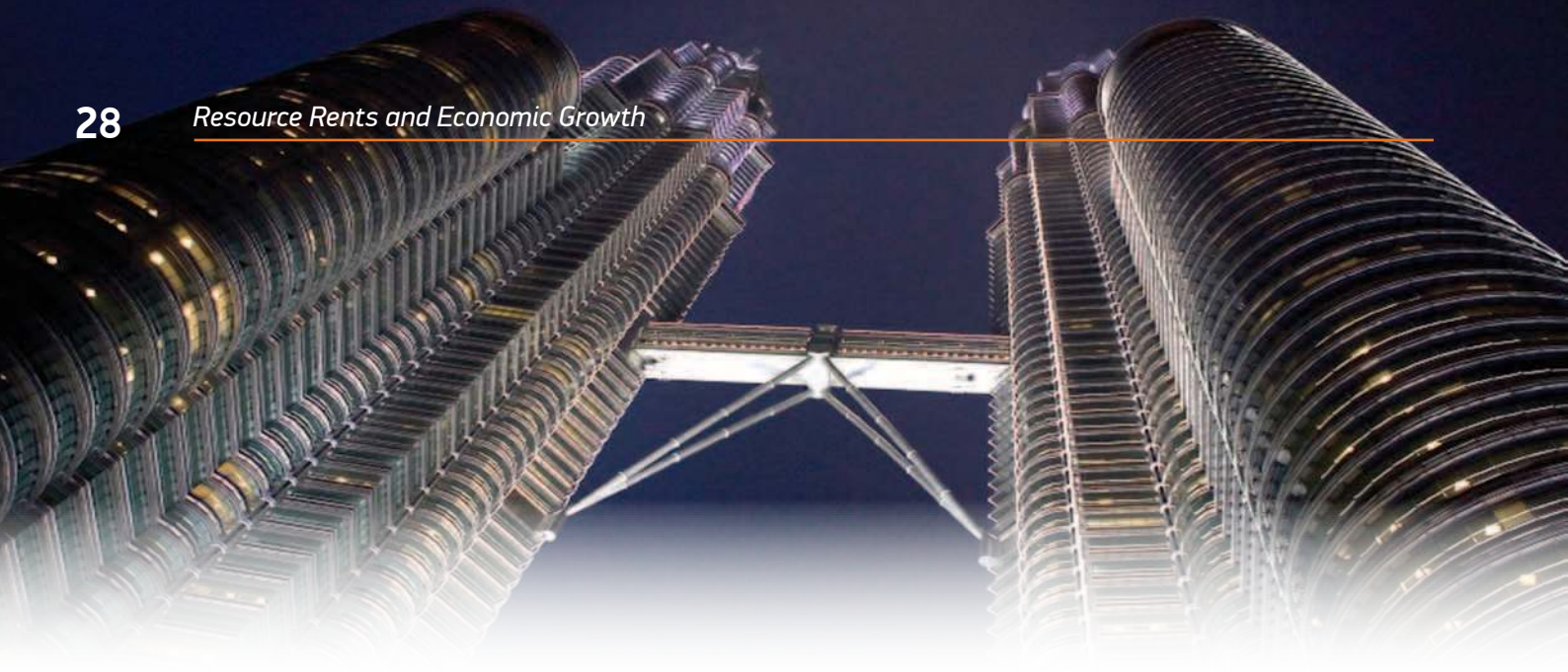
Homicide rate in oil&gas economies, 2008
Countries grouped according to their rankings in three reports measuring institutional strength (Fraser Institute, World Bank and World Economic Forum



Data source: UNODC

Economic Freedom - EF Doing Business - DB Global Competitiveness - GC

Graph 1.15



SECTION TWO: Policies

Comparative analysis of economic models and key policies in resource economies.

2.1. Economic freedom

Why does economic freedom matter, and how is it measured?

In the 1980s, Milton and Rose Friedman, together with Michael Walker, staged a series of conferences dedicated to economic freedom. These conferences resulted in the publication of the first Economic Freedom of the World (EFW) report under the auspices of the Canadian Fraser Institute. Since then, the EFW report has been annually publishing data representing the various factors which make countries economically free. Today the report covers the 144 economies (95 % of the world's population) for which relevant data is available. In its data it relies on a network of associated institutes from 85 countries which contribute to Fraser's research. Today the EFW is one of the most broadly acknowledged measurements of the quality of institutions. A number of economists and organisations have used the EFW as a benchmark of institutional development; the IMF's World Economic Outlook, for instance. The two main reasons for that are the track-record and breadth of the EFW. It has been around for over 25 years, as opposed to the two other most well-known indices, the World Bank's "Doing Business" and the Global Competitiveness Report of the World Economic Forum, which have existed for less than 10 years. In addition, EFW is possibly the most comprehensive of the indices as it incorporates some of the data from the other two ratings among dozens of other sources (see Appendix to the EFW 2013 publication for explanatory notes and data sources).

How should economic freedom be defined? One of its definitions was given by James Gwartney, one of the authors of the Economic Freedom of the World (EFW) report:

> "Individuals have economic freedom when property they acquire without the use of force, fraud, or theft is protected from physical invasions by others and they are free to use, exchange, or give their property as long as their actions do not violate the identical rights of others. An index of economic freedom should measure the extent to which rightly acquired property is protected and individuals are engaged in voluntary transactions." (James Gwartney et al., 1996).

According to the EFW, there are 42 government policies which affect economic freedom. The Fraser Institute measures them based on quantifiable characteristics and independent surveys. The data is organised into five main categories which, broadly speaking, define the institutional framework which constitutes economic freedom:

- Rule of law and property rights
- Size of government and taxation
- Soundness of money
- Trade regulation and tariffs
- Regulation of business, labour and capital markets

Economic freedom is important because it is a major prerequisite to economic growth and development. Comparisons conducted by the Fraser Institute demonstrate that economic growth across all countries surveyed is strongly correlated with economic freedom. It is also a prerequisite for certain other parameters of human development. Higher economic freedom is positively correlated with such indicators as life expectancy, literacy, and civil and political rights. It is negatively correlated with poverty and corruption (for details see the 2012 publication of the Economic Freedom of the World report). Last, but not least, economic freedom is not limited to well-being. Economic rights and, more narrowly, property rights, are an inalienable part of fundamental human rights. Thus political and civil liberties are incomplete in the absence of economic freedom.

The influence of economic freedom on economic growth and development in resource-abundant countries

Where do resource-abundant countries stand in terms of economic freedom? If one first looks at the bottom ten global economies in terms of economic freedom scores, it may appear to prove the "resource curse" hypothesis. Eight out of ten qualify as resource economies: Mozambique, Algeria, Congo DR, Angola, Republic of Congo, Zimbabwe, Myanmar (Burma) – and closing the global list as least economically free is Venezuela.

Economic freedom is important because it is a major prerequisite to economic growth and development. Comparisons conducted by the Fraser Institute demonstrate that economic growth across all countries surveyed is strongly correlated with economic freedom.

However, this gloomy picture for resource economies is somewhat improved when one then switches to the top ten most free economies. Half of them are resource-abundant countries: Australia, Canada, Bahrain, Finland and Chile. What seems to be the case here is not "resource curse" but rather "resource polarisation", consistent with the Mehlum-Moene-Torvik producers vs "grabbers" model where resource-rich countries with institutional deficiencies perform worse then resource-poor countries with the same level of institutional development. At the same time, mineral resource can give a boost to those economies with more developed institutions.

A number of economists have analysed the role of institutions which define the overall level of economic freedom and influence growth in resource economies. Such studies include Krueger et al. (1991), Lal and Myint (1996), Easterly and Levine (1997), McMahon (1997), Mikesell (1997), Auty (1998), Ross (1999 and 2001), Atkinson and Hamilton (2003). Overwhelmingly, those authors concluded that institutional development is both positively and strongly correlated with economic success in resource-abundant countries. The mechanisms through which economic freedom fosters growth and development are largely related to its impact on rent-seeking. Secure property rights, fair and efficient enforcement of contracts, freedom of trade, and limits on the government's ability to transfer wealth through subsidies and regulation in effect reduce the rate of return on unproductive economic activities. On the other hand, the stronger those institutions are, the more profitable it is to generate wealth through productive entrepreneurship instead of "grabbing".

There are other reasons why economic freedom and those institutions which characterise it can stimulate growth in resource-rich countries. As we argued earlier, both the "Dutch disease" and the negative impact of price volatility are essentially institutional rather than purely economic problems. Both of them become problems under specific circumstances which are usually associated with institutional deficiency. Finally, one other channel though which economic freedom can stimulate growth and development is the reduction of conflict. Gartzke (2005) found that economic institutions are by far more effective than non-economic institutions in diminishing violence. Another publication by Tules (2003) finds that higher levels of economic freedom reduce the likelihood of both internal and external conflict worldwide.

Following the success of its Economic Freedom of the World (EFW) index, the Fraser Institute started publishing an annual Survey of Mining Companies, which examines the investment climate in mining economies, and a Global Petroleum Survey, an annual survey of petroleum executives regard-

ing barriers to investment in oil- and gas-producing regions around the world. Later, a study was published by Louis-Philippe Beland and Raaj Tiagi, under the auspices of the Fraser Institute, titled "Economic Freedom and the "Resource Curse": An Empirical Analysis" (2009). It looks at how economic freedom, as measured by the EFW index, correlates with economic growth in countries with a high share of income from exports of metals and ores (in mining but not oil and gas economies). The study used data for real GDP per capita from the World Bank for the period 1970 to 2006.

A mineral-exporting country can catch up in its economic development if it improves its level of economic freedom. Even with relatively small improvements, the results are positive and quite significant.

A series of regressions performed by the authors included an interaction term measuring how institutions influence the effect that natural resources have on economic growth. The study finds that the interaction term is positive and significant. Econometric analysis by Beland and Tiagi (2009) indicates that, in countries with low scores for economic freedom, natural resources hamper growth, while countries with high levels of economic freedom perform significantly better. They even outperform their resource-poor peers with the same score. Also, those results show that **a mineral-exporting country can catch up in its economic development if it improves its level of economic freedom. Even with relatively small improvements, the results are positive and quite significant.** All of that is consistent with the Mehlum-Moene-Torvik model described earlier, which suggests a multiplier effect in resource economies, so that both positive and negative tendencies are amplified, as producer-friendly institutions stimulate production, while grabber-friendly institutions hamper production (Mehlum et al., 2006).

We performed our own analysis using more recent data for a broader range of countries (including oil and gas economies). We divide resource and oil and gas economies into four quartiles, in accordance with their rating of economic freedom. We then compare the performance of those quartiles using the same eight parameters as measurements of economic and social development: real GDP per capita (purchasing power parity – PPP); foreign direct investment; Human Development Index (HDI); life expectancy; literacy rate; freedom from corruption; homicide rate; and violations of civil liberties rating.

Our analysis indicates a strong positive correlation of economic freedom in resource economies with the level of real GDP per capita (purchasing power parity) and other economic and social indicators. Similarly to the other two institutional ratings, in all groups and for all parameters, in countries with

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higher levels of economic freedom, both real per capita income and human development scores are higher, people live longer, there is more investment and more civil rights. Higher economic freedom correlates with lower crime, corruption and illiteracy levels. In the above section (Illustrations for Section 1; Graphs 1.1–1.15 on pp. 23–27) are selected graphs that represent our finding. We obtained similar results by running econometric regressions for various data sets representing reseource economies' performance indicators. **The most important conclusion, based on the research to date, along with our own findings, is that the economic and social performance of resource economies depends primarily on the strength of their institutional framework, of which economic freedom is the best measurement.** The following chapters of this report are dedicated to some key policy areas, and examples of practical experience in achieving high levels of institutional development by resource-exporting countries.

2.2. The share and role of government

Major types of government involvement and their impact. The influence of the government's share of ownership in extractive industries on overall economic performance

The evolution of the role and scope of government in the 20th century has been examined by a number of economists, such as, for example, Vito Tanzi from the IMF (Tanzi, 2000 and Tanzi and Schuknecht, 2000), Martin Wolf, economic editor of the Financial Times (Wolf, 2001), Daniel J. Mitchell from the Cato Institute (Mitchell, 2005 and Mitchell and Edwards, 2010) and James Gwartney et al. from the Fraser Institute (Gwarteny et al., 1998 and 2006). Based on some of this literature, we suggest the following distinction between three broad types of government activities which constitute **channels though which government activities affect economic growth:**

Regulation. This is the area of government activity which has a particularly strong impact. Some areas of regulation are essential for a well-functioning institutional system (as discussed above), such as independent courts or law enforcement agencies. However the further a specific area of regulation is removed from the core functions of government the more likely it is to have negative effects on economic growth. Regulation possesses a "multiplier effect" which can be either positive or negative: efficient regulation which reinforces the rule of law can boost economic development while even small regulatory agencies can slow down growth through red tape, bottlenecks, and market distortions.

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Redistribution. The process of taxing individuals and business and spending the receipts through various government programmes has several costs associated with it. Among such costs, as outlined by Daniel J. Mitchell (2005), are:
a) *the displacement cost:* the government cannot spend money without first taking that money from someone, and thus government spending displaces private-sector activity;
b) *the behavioral subsidy cost:* government spending subsidises choices which otherwise would not be desirable, such as, for example, high unemployment benefits encouraging some people to stay out of work;
c) *the stagnation cost:* subsidies often hamper innovation by constraining Schumpeterian "creative destruction", as government programs are inflexible, due to their centralisation and bureaucracy.

Ownership. This is a case where the government owns certain enterprises, either creating a monopoly or competing with private companies. The inefficiency of government-owned enterprises can impact the overall economy in several ways: by underperforming relative to the private sector, by crowding out private investment, and by monopolising a certain industry.

As we examined earlier, resource economies are particularly prone to excessive government interference. This occurs through all three channels: regulation, redistribution, and government ownership. We have already analysed the regulatory channel, which has a strong multiplier effect. In resource economies the multiplier effect for both positive (enhancing the rule of law) or negative (red-tape, rent-seeking) aspects of regulation tends to be especially pronounced. The other two channels – government-led redistribution and state ownership – are also very influential in resource economies. It is now worth looking at how different structures of ownership in the extractive industries (private, state, or mixed) and various policies related to redistribution (such as stabilization funds and government investments) can impact overall economic growth and development in resource economies.

The Organization of Petroleum Exporting Countries (OPEC) was founded in 1960. It developed into a club of countries with mostly government-dominated oil sectors. Since then, the world oil and gas industry has gone through a profound evolution of ownership. In many developing countries which account for most of global hydrocarbon production, governments took control of their oil and gas sectors by means of expropriations, nationalisation, or renegotiations with international companies. This resulted in an industry where not only reserves in the ground are owned by governments, but also most of the produced oil and gas is attributed to government corporations. The latter are often referred to as national oil companies (NOCs), while major privately-owned transnational corporations are called IOCs (international oil companies). There are various reasons

There is a strong trend towards higher income per capita (and other development indicators) in countries which have privately-owned oil companies, and lower levels of real GDP per capita in countries with government-controlled sectors.

for NOCs' domination of the industry. They often rely on strong political and emotional motives, such as resource nationalism. For the purposes of this report, however, what interests us is the relative economic performance of oil producing countries which adopted different models of ownership and sector organisation. Thus, we are trying to separate the issue of overall management efficiency from political sentiments. We agree with Thorvaldur Gylfason from the University of Iceland, who argued that:

> "What seems to matter for economic growth is not the abundance of natural resources per se, but rather the quality of their management, and of economic management and institutions in general." (Gylfason, 2001: p. 1).

That is why we decided to compare economic indicators in oil exporting countries, which we organised into four groups by their oil industry ownership structure. We measured ownership by the amount of oil and gas combined production attributed to either private or state-owned companies. We compared some of the most significant oil-producing countries which are net exporters of oil, and thus qualify as "oil economies". The four groups are: "Mostly private" (over 80 % of hydrocarbon production is privately owned; seven countries); "Mixed structure" (between 20 % and 80 % is privately owned; 10 countries, including Russia); "Government-controlled" (over 80 % is owned by government companies; seven countries); "Gulf model", for the six countries of the Gulf Cooperation Council (GCC). The full list of countries is available in the *Appendix*. The next chapter explains why we singled out GCC countries from other groups. Our analysis indicates that **there is a strong trend towards higher income per capita (and other development indicators) in countries which have privately-owned oil companies, and lower levels of real GDP per capita in countries with government-controlled sectors** (see Graphs 2.1–2.9 on pp. 48–50).

We also performed a more targeted analysis comparing the world's largest oil companies by one key parameter which characterises their performance: net income per barrel of oil equivalent produced (which includes combined production of both oil and gas). **The average net income per barrel of the nine largest privately-owned oil companies is more then double that of the nine largest state-owned oil companies** (19.1 and 8.8 USD /barrel respectively, with all companies having production above 1.5 million barrels a day, see Graph 2.10 on p. 51). We should also note that these results are clearly achieved in unequal conditions. Most of the state-owned companies operate in their home territory, where they enjoy favorable conditions and access to more reserves with higher quality, which is not the case with most privately-owned companies. The latter manage to outperform government producers while normally facing tougher conditions, which often include abrupt changes

of contract terms, higher taxes, and occasional license revocations and expropriations.

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While the above numbers speak for themselves, the balance of ownership has even of late continued to shift in the direction of state oil companies. Although the peak of nationalisations of the 1960s and 1970s is long gone, the idea of resource nationalism is still going strong. The irony of it is that, from all the evidence we have, not only is company income per barrel significantly higher among private companies, but government earnings per barrel are higher too. As demonstrated by the cases of **Iran**, **Venezuela**, and **Mexico**, a prolonged state monopoly of the oil industry results in its stagnation and an overall fall of government income. **Mexico's Pemex** is a very powerful example. The sector was nationalised in the 1930s, which makes it one of the longest-surviving state oil monopolies. Overall results are telling: even under the high oil price in 2012 the company was on the edge of making a negative return on a barrel of oil produced (see Graph 2.10 on p. 51). Prior to 2012 it had actually been making a loss. At the same time, the examples of **Australia** and **Canada** (which, on the back of a surge in hydrocarbon production, have enjoyed rapid economic growth over the recent years, while most other OECD countries have struggled with a recession), as well as the **USA**, with its "shale gas revolution", demonstrate the advantages of private ownership in the energy sector.

It is worth making one remark. Although, as we just pointed out, practical evidence argues strongly in favour of private resource production, privately-owned companies are not a universal remedy. As we have already emphasised, institutions are the key ingredient to a successful economic model in resource-exporting countries. **Without strong and transparent institutions, private companies are quickly corrupted through rent-seeking, as returns on "grabbing" outweigh returns on productive enterprise. The result is a structure which may look like a privately-owned one on the surface, but is actually a system of state-affiliated interest groups and clans.** Furthermore, under certain conditions, and within the right policy framework, some state corporations manage to achieve impressive results. What matters is the way a particular company is organised, and, even more importantly, the overall institutional environment in which it operates. **State-owned firms, which rely on strong and lasting partnerships with international companies, tend to perform much better than government enterprises which develop in autarchy.** The best example is **Malaysia's Petronas**, which is state owned and for decades has relied

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on alliances with foreign companies to effectively run the Malaysian oil and gas sector, and rapidly grow its business both domestically and overseas. International alliances have allowed Malaysia to keep an edge in the global market, by, for example, becoming a leading exporter of liquefied natural gas (we will have a closer look at Malaysia's policies in Section 3). Some organisations have studied the role of governments in managing natural resource wealth, including the performance of government-controlled enterprises. One of such organisations is Norway's Oil for Development project (see Nore, 2009).

The superior results of private companies are not limited to oil economies, but are also evident from the experiences of countries with substantial mining industries. As a result of opening its mining sector to private investment, Indonesia was able to boost its production of gold, tin, nickel, and copper by about 50 % in less then ten years. The **Indonesian** government was able to increase its revenues from the mining sector almost fivefold, from $700mn in 2000 to $3,400mn in 2006, while (not coincidentally) actually reducing its overall tax and royalty rates on mining companies, from 60 to 45 %. **Armenia** managed to become one of the main global producers of molybdenum after the government sold the country's largest processing complex to a private consortium of Armenian and German companies, which led to higher output. Today there are 12 private companies operating functioning mines in Armenia, which account for 17 % of industrial production, and make a significant contribution to rapid economic development.

In 2006 Erika Weinthal from Duke University and Pauline Jones Luong from Brown University published a paper titled "Combating the Resource Curse: An Alternative Solution to Managing Mineral Wealth" (2006), in which they call for a paradigm shift among the governments of oil-producing countries. In their view, more private ownership in the industry would increase overall efficiency and also boost government income. They argue that, to avoid the resource nationalism problem, domestic private ownership by national private companies could be a more feasible solution. In the third section of this report we will look at some examples of countries which managed to avoid the inefficiency trap in managing their oil and gas resources.

To spend or not to spend? Stabilisation funds, diversification, and government investment in resource economies. Alternative solutions: Alaska's experience with oil dividends

Should the government allocate part of its receipts from mineral exports into a special fund, in order to alleviate the "Dutch disease", and save

for a rainy day? The idea of stabilisation funds has certainly gained popularity over the last several decades as some countries have successfully developed such national entities. Comparing economies with and without them, the overall results are (moderately) on the side of stabilisation funds.

That however should not divert attention (as it often does) from the fundamental question of institutional development. **Stabilisation funds, if implemented properly with the right level of self-discipline, may be a useful economic policy tool. But they are not a panacea.** As we have argued before, both the "Dutch disease" and the negative impact of price volatility are essentially institutional rather than purely economic problems. Thus, both of them should have an institutional solution. A freer economic environment with equal opportunities stimulates private investment in non-resource industries, through increased entrepreneurial activity and innovation. In addition, economic freedom may help to alleviate the effect of the "Dutch Disease" by decreasing competition for wages and capital, by making capital and labour more available as a result of easing restrictions on their movements. As to price volatility, vulnerability to price fluctuations is reduced, as a freer economy relies less on redistribution and pay-outs by the government. Private sector firms are better at dealing with the effects of commodity price volatility than state-run corporations.

From 1966 to 1989, **Botswana** was the fastest-growing economy in the world, transforming itself over that period from one of the poorest states to an upper middle-income country (see Graph 3.9 on p. 64). This success has largely been due to both strengthened institutions and prudent management of Botswana's diamond revenues (nearly a quarter of the world's diamond reserves are located in Botswana). Botswana follows a strategy of fixed public spending, allowing the government to accumulate revenue surpluses during boom years. Recurrent revenue surpluses that are not spent are transferred into Botswana's Foreign Reserves Fund. By the mid-1990s, interest payments on these reserves became the largest source of Botswana's government revenue after diamond sales. Between 1976 and 2008, foreign exchange reserves grew from $75m to $10bn, which equaled 33 months of import cover. This mitigates the impact of price volatility, allowing the government to maintain public spending when commodity markets turn bearish. There are other examples of stabilisation and sovereign funds which significantly aided public administration in countries such as **Norway**, **Malaysia** and **Oman**. In **Russia**, the Stabilisation Fund helped the country to weather the storm of the financial crisis and the oil price drop in 2008–2009 by providing an emergency reserve for the economy. We will have a closer look at Russia's sovereign funds in the last section.

Stabilisation funds, if implemented properly with the right level of self-discipline, may be a useful economic policy tool. But they are not a panacea.

To summarise, stabilisation funds, if designed and run properly, can serve the following purposes:

- Sterilise revenue inflows when commodity prices are high, to mitigate upward pressure on the national currency exchange rate, which is one of the main effects of the "Dutch disease".
- Manage price volatility risks and maintain public spending levels during downturns.
- Introduce some budgetary discipline by capping government spending.

Whether a stabilisation fund achieves those goals depends critically on whether it is sufficiently insulated from political pressures. Needless to say that this, once again, depends on the quality of institutions. If institutions are weak, and rent-seeking is rampant, a stabilisation fund will simply become another vehicle for redistributing mineral revenues into the hands of political cronies.

Even assuming there is sufficient self-restraint on behalf of the government, allowing a stabilisation fund to operate with adequate independence, the question still remains of what to do with the accumulated reserves. In many countries with stabilization funds, that question has provoked an active nation-wide discussion. Regardless of the outcome of such debates, the very fact that they are taking place should be viewed as a positive development. A discussion about how income from mineral exports should be spent is better than rubberstamping public expenditure programmes. Multiple suggestions have been made on how to spend accumulated reserves. They vary significantly for different countries, and depend on the sociopolitical system in place, existing levels of income, and other national features. Below are the most common policy suggestions, with our comments.

Government investment. If money from a stabilisation fund is spent on government-run projects, that fund simply becomes a smokescreen for more government spending. Such a policy is harmful in two ways. First, it defeats the primary purpose of the fund to sterilise part of the inflow of cash into the economy, especially during commodity price booms. If money is spent instantly, the fund simply becomes useless against the "Dutch disease". Secondly, such a fund diverts money into government direct investments, which are often large-scale infrastructure developments and all sorts of "vanity projects". That approach is vaguely based on Keynesian economic theory, although it usually takes those ideas to an extreme far beyond that envisaged by Keynes. The idea that the government can boost growth by spending more money (or increasing the "purchasing power of the economy", as politicians cleverly refer to it) used to be popular about forty years ago. Since then, evidence and common

sense have largely worked against such policies. A number of studies also demonstrated the theoretical fallacy of this approach (for instance, Hansson and Henrekson, 1994, and Blanchard and Perotti, 2002). Government investment creates an illusion of a boost. First of all, as we outlined earlier, the government cannot spend money without first taking that money from someone. Government spending displaces private-sector activity. Secondly, economic growth is a function of increased productivity. From experience, investments in government-run projects do not increase overall efficiency but decrease it. Despite all that, government investment initiatives are still popular with politicians, simply because they boost their popularity, and also provide excellent opportunities for extracting rents and outright misappropriation.

Diversification – picking winners. Since direct government investment is often hard to defend due to its bad reputation, some governments embrace a somewhat more sophisticated policy, which is often referred to as "encouraging local businesses" or "diversification", and implies supporting companies in certain sectors through subsidies and loans. It is defended on the grounds that a more diversified economy is less vulnerable to commodity price volatility, and is thus more sustainable. The general premise makes sense. Other things equal, diversified economies usually have a more balanced growth trajectory and often enjoy higher growth rates. But the devil is in the detail. Diversification is a means to an end, namely higher growth though increased economic efficiency. The problem with government-subsidised diversification is that it reverses this logic, by making diversification an end goal of government policies in itself. Diversification makes sense when it increases overall efficiency, which is hardly possible if the government is picking winners. The fact that a given economy is not diversified is the result of inadequate efficiency (and also bureaucratic red-tape), which prevents businesses from making a profit in other sectors. By pouring money into those sectors, the efficiency problem is not resolved but aggravated. As Sarraf and Jiwanji (2001) point out, "[g]overnments tend to invest in projects with low rates of return compared to the private sector". And government-driven diversification suffers from the same rent-seeking and corruption problem as direct investments and infrastructure programmes.

Sovereign funds. Unlike the previous two, this strategy is often politically inconvenient for the government, due to criticism that it receives. Investing part of export earnings into the global stock and bond market can be perceived as unpatriotic. Despite that, it does have at least one advantage. It can be a partial solution to the "Dutch disease" problem, by sterilising the inflow of foreign currency into the domestic economy during commodity price booms. Some people argue that such a strategy is also more detached from domestic interest groups, and thus less

We would argue that sovereign funds – assuming they attract qualified fund managers, and stay as far from politics as it is possible – are the best of the options listed above.

prone to rent-seeking. A somewhat more politically feasible variation is a sovereign fund, which is as closely modeled on a private fund as possible, with the principle difference being that its beneficiary is the government. Its investment strategy is not tied to a particular geographic location. Investments are made both domestically and overseas, with the principal goal being that of getting the highest return. A number of sovereign funds operate in both resource-rich and resource-poor countries. Their performance generally receives mixed reviews. Some of them have comparable rates of return to private hedge funds and private equity firms, while some of them make a lower return. And some of them are actually funds of funds: they choose to outsource the investment process by buying stakes in multiple private funds.

We would argue that sovereign funds – assuming they attract qualified fund managers, and stay as far from politics as it is possible – are the best of the options listed above. Whether they are an optimal way to manage government income is still an open question. One might argue that, for economies which almost entirely depend on exports of a single mineral commodity, such as, for example, Oman or Botswana, it is important to maintain sizeable reserves in order to manage public spending when prices are low. For these countries, having a limited emergency fund would be a good idea.

But where is the limit? What happens if reserves in the fund continue to grow on the back of high prices? Should the government reduce (or even suspend) the amount of money that gets diverted into the fund after it reaches a certain level? These are not rhetorical questions. Norway's Government Pension Fund is one of the largest funds in the world, and continues to grow. It does not seem, however, that the Norwegian government has an answer to those questions. What is clear is that, if the government manages to maintain a balanced budget while more and more money flows into the sovereign fund, this simply means that the state extracts from the economy far more than is necessary to fulfill its obligations. The question then is whether the government should continue to take that much from the economy if it is not even sure what to do with the money. Would it not be fairer and more efficient if the surplus money was left in the economy? Some would argue that, in a resource-dependent economy, there would not be enough domestic businesses to invest in, and thus people and companies would choose to take their increased incomes abroad. But even if that were the case, it is no different from what the government is doing through its sovereign fund anyway.

Put simply, do people really need the government to manage their money?

Put simply, do people really need the government to manage their money? As theoretical as they might seem, those questions give food for thought, and ex-

pose some important dilemmas concerning the role and scope of government in a resource economy.

Despite political difficulties, some alternative solutions have been proposed, and one of them has even been tested on a limited scale. **Several economists have suggested that resource-rich countries should distribute part of their natural resource revenues directly to their citizens** (Ross, 2001b; Eifert et al., 2003; Sala-i-Martin and Subramanian, 2003). **It could be done in the form of a special oil dividend (known as the Permanent Fund Dividend) which has been paid to all residents in Alaska since 1983. For example, in 2013, each citizen received US$900.** The dividend is paid once a year from the Alaska Permanent Fund, a sovereign entity which accumulates a share of government revenues from the oil industry. The Fund grew from an initial investment of US$734,000 in 1977 to approximately US$42.1 billion in 2012 (see Alaska Permanent Fund Corporation Balance Sheet 2012).

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It could be done in the form of a special oil dividend (known as the Permanent Fund Dividend) which has been paid to all residents in Alaska since 1983. For example, in 2013, each citizen received US$900.

The idea of a citizen's dividend can be traced back to the pamphlet "Agrarian Justice" (1795) published by Thomas Paine, an influential political thinker during the American Revolution. Such an idea takes the common notion that natural resources in the ground "belong to the people" back to its actual meaning. If mineral wealth belongs to every citizen in the country then, one might argue, everyone has a claim to an equal share of that wealth. What share of export revenues should the government be allowed to retain is subject to a separate discussion, as is the way such a transfer would be administered. It could be arranged as a special "oil account", opened for every citizen, or perhaps merged with individual pension accounts. Although this idea may seem farfetched, and has not yet gained broad support, it would be unfair to rule it out. In the future, with the rise of civil society, and the spread of modern communications, it may become part of the social agenda across many resource-rich countries.

2.3. Innovation and labour mobility

The role of innovation in extractive industries. The "shale revolution" and the emergence of new centres of production (Canada, USA, Australia)

The "shale revolution" started with the economic success of the Barnett Shale play in Texas in 1997. In 2000, shale gas provided only 1 % of the **United States'** natural gas production; by 2012 it reached over a quarter. The US Energy Information Administration forecasts that by 2035, 46 %

of US natural gas supply will come from shale gas. Furthermore, by 2017, due to growing shale gas production, the US is expected to become a net exporter of natural gas. The success of shale hydrocarbon technology stretches beyond the United States. Innovation in shale gas was accompanied by a breakthrough in shale oil production, specifically in **Canada**. As a result, in 2012 the US and Canada accounted for 25 % of global natural gas production and 14 % of oil production.

Other countries are catching up too. **China** is estimated to have the largest shale gas reserves in the world and is expected to be the global centre of shale gas development outside North America. By 2030, it could account for 20 % of total Chinese gas production. And there is visible progress in developing other unconventional hydrocarbons such as coal bed methane. The International Energy Agency (IEA) expects **Australia**, one of the fastest growing producers of coal bed methane, to overtake Qatar as the world's biggest exporter of liquefied natural gas.

Breakthroughs in shale gas and shale oil technologies are having a strong influence on the broader global energy landscape. Firstly, gas price formulas are increasingly delinked from the oil price. This is an important change in the gas market, reflecting the growing supply of unconventional gas. Secondly, it has a strong influence on geopolitics of global energy, as the balance of hydrocarbon production is shifting towards countries which were for a long time seen as dependent on foreign oil and gas. The emergence of new centres of production, such as the US, Canada, Australia, and potentially China, is undermining the influence of OPEC as a global oil cartel, while traditional importers are becoming more energy-independent (the International Energy Agency expects the US to cut its oil imports in half by 2020). OPEC's weight in global energy is further undermined by the growing significance of gas as a global fuel. The International Energy Agency predicts in its "Golden Age of Gas" report, that by 2030 a quarter of global energy will be produced from gas – the same share as oil.

The consequences of those developments go beyond the energy sector itself. The increasing share of gas in fuel consumption is already having a profound effect on the environmental debate. The burning of natural gas emits half the greenhouse gases that coal does, and 30 % less than oil. For those politicians and NGO activists who have argued in favour of curbing greenhouse gas emissions, natural gas may become a game changer. Tellingly, as gas has partially replaced other fuels in the US (which did not sign the Kyoto agreement, to the dismay of many eco-campaigners), in 2012 US carbon dioxide emissions dropped to their lowest level in 20 years, while European countries which signed the Kyoto accord are failing to meet their emissions targets. As a result, a growing number of environmentalists are fine-tuning their position from anti-fossil fuel to "pro-gas".

According to the BP Energy Outlook 2030, worldwide there are estimated to be 200 trillion cubic meters of technically recoverable shale gas and 240 billion barrels of shale oil. By the year 2030, their development will account for over 20 % of the increase in the world's hydrocarbon supply. What brought about such a significant shift in the global energy landscape? On a technical level what made it possible was a breakthrough in three key technologies – horizontal drilling, hydraulic fracturing and advances in seismic data collection and its digital interpretation. Shale gas is different from conventional gas only in the way it is trapped in the ground: it is diffuse rather than concentrated in isolated wells. Horizontal drilling is required to identify concentrations of shale gas, and then the rock needs to be fractured with water to release the gas, so that it can flow to the surface. Sufficient advances were made in those technologies to enable the commercial production of shale gas. Most of the deposits of shale gas had been identified long before their development became economically feasible. Technological progress allowed companies to book those deposits as commercial reserves and start production.

It is not a coincidence that a breakthrough in unconventional hydrocarbons took place in countries which are in the top of the Economic Freedom of the World rating.

There is one aspect of the "shale revolution" which gets much less attention in the media than geopolitical or environmental issues. What were the conditions that allowed the technological innovation to happen? **It is not a coincidence that a breakthrough in unconventional hydrocarbons took place in countries which are in the top of the Economic Freedom of the World rating,** such as Canada, the US and Australia. It was also helped by other favorable conditions, such as high gas prices in the 2000s. But the institutional component was the decisive factor. It is the combination of secure property rights, a favourable tax regime, transparent and efficient regulation, and minimal red-tape. It is also important to point out that all three countries have extractive sectors with multiple private companies, ranging from small exploration firms to vertically integrated multinationals. It was not one corporation alone, but several of them, such as Chevron, Shell, Devon, Talisman Energy, Chesapeake, and Range Resources, which developed technologies for the commercial extraction of shale gas. They were all in tough competition for limited capital and human resources, which made them focus on the most efficient technologies. It is not surprising then, that despite the world's largest shale gas reserves, the shale gas boom did not start in China, which is dominated by government oil and gas companies. **The institutional conditions which allowed the "shale revolution" to happen should be carefully studied by policy-makers in other countries, especially in resource economies.**

The institutional conditions which allowed the "shale revolution" to happen should be carefully studied by policy-makers in other countries, especially in resource economies.

An important externality of the shale boom is that it helped to undermine a common prejudice against extractive industries as being not sufficiently innovative. **The idea that in order to modernise and enter the post-industrial era, a country needs to shift away from mineral production, is often repeated by politicians who are eager to be seen as "cutting-edge". It is about time for that outdated attitude to become history. The "shale revolution" is in essence a technological breakthrough of the highest caliber**.

The influence of resource rents on the labour market. Different approaches to immigration policies in resource economies

Economic effects of the "Dutch disease" were discussed in the first section of this report. A special area of effect in a resource-exporting economy is the labour market. Assuming a "small open economy" model, the "Dutch disease" can have the following effect on the domestic workforce: the "resource movement effect" produces a shift of labour to the resource sector, while the "spending effect" increases wages and moves labour into the non-tradable (services) sector. As a result, labour leaves the contracting manufacturing sector. Consequently, high wages in the resource sector push wages up in the services sector which in turn inflates prices for services. At the same time, low-paid jobs become increasingly unpopular, thus creating a shortage of low-paid labour. In parallel, the resource sector may experience a shortage of highly qualified specialists to manage and operate oil and gas production and geological exploration. Thus, in many resource economies, a market for labour in both the highly skilled and the low-paid segments, often emerges.

Labour immigration into the Gulf Arab countries presents a rather unique policy model for a resource economy. The Gulf Cooperation Council (GCC) is an international organisation with six member states: Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the United Arab Emirates. The overall reliance on expatriate labour is unparalleled: from the "low" 53.1 % in Saudi Arabia, to the highest in Qatar, where foreigners constitute a staggering 94.4 % of the workforce. Hence, in terms of their workforce structure, GCC countries stand out as a very peculiar case among other resource economies (see Graphs 2.11–2.13 on pp. 51–52). Low-skilled workers represent the majority of all non-nationals in the GCC. Most of them work either in the services sector or in construction, while nationals mostly work in the public sector.

The idea that in order to modernise and enter the post-industrial era, a country needs to shift away from mineral production, is often repeated by politicians who are eager to be seen as "cutting-edge". It is about time for that outdated attitude to become history. The "shale revolution" is in essence a technological breakthrough of the highest calibe.

Gulf countries' unique workforce arrangements correlate with their overall peculiar economic structure. That is why we singled out GCC countries in our earlier analysis of oil and gas states' performance (see Graphs 2.1–2.6 on pp. 48–49). Their main characteristic is a combination of unmatched hydrocarbon reserves and production, and small (sometimes very small, as in Qatar or Bahrain) indigenous populations. The exception is Saudi Arabia, which has a population of 28.3 million. Oil and gas production in GCC countries is predominantly state-controlled, but it heavily relies on international service companies and highly skilled expat specialists working for Gulf national companies; immigration to GCC is certainly not limited to low-skilled workers. GCC oil companies are arguably the most cosmopolitan in the world – even more so than international oil corporations. Although the hydrocarbon sector is state-controlled, in many of the Gulf countries, overall economic policies outside of the oil industry are very open and favourable to foreign investors. Gulf states generally rate highly in the Economic Freedom of the World index. At the same time, high levels of economic freedom coexist with very low ratings on civil liberties and political rights. We should also note that governments of all GCC countries are organized as very traditional monarchies. Despite the fact that foreigners constitute the majority of the population in all GCC countries, apart from Saudi Arabia, they are considered to be temporary guest workers, tied to renewable work visas, and most of them do not integrate into the social and cultural fabric of the host nation. Given the proportion of foreign nationals, it is possible to argue that **Gulf Arab countries have, in fact, not one but rather two parallel societies which coexist and codepend upon each other.**

Gulf Arab countries have, in fact, not one but rather two parallel societies which coexist and codepend upon each other.

Whatever one might think of the unusual economic and social arrangement that exists in the Gulf Arab states, one thing is certain: that particular system is an anomaly and is not likely to be replicated elsewhere for a variety of economic, political and cultural reasons. The question then, is what are the policy options on immigration for other oil and gas economies? We analysed the percentage of immigrants in four groups of oil and gas economies in accordance with their level of economic freedom (see Graphs 2.11–2.12 on p. 51). The three most economically free countries among oil and gas economies – Australia, Canada and Norway, which constitute the "Most free" group – have an average number of immigrants equal to 20.3 % of the total population. This is significantly higher than levels among economies in groups with lower economic freedom ratings. That number is, however, much lower than in the GCC states (34 % average). Among the three freest countries, Australia and Canada have immigrant populations of 21.4 % and 21.1 % respectively, while Norway has about 10 %. In comparison, according to the World Bank, Russia has 8.9 %.

Sustainable and harmonious immigration is not a numbers game. A certain country may find it difficult to integrate even a small percentage of immigrants while other countries can accommodate larger numbers without causing strong social tensions. What matters is the institutional framework and the economic model.

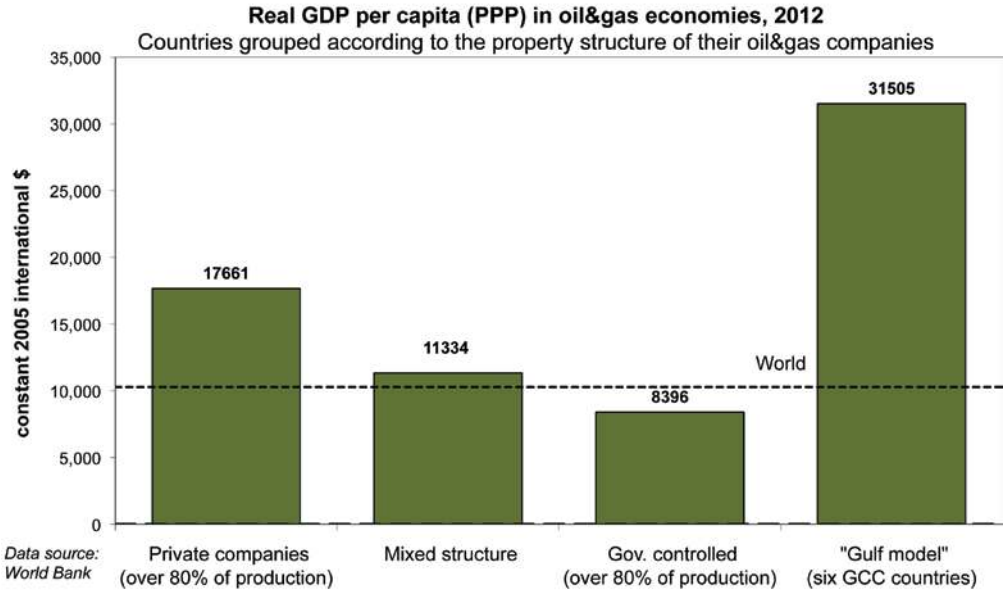
Canadian and Australian immigration policies are often considered to be role models for other countries. The curious thing is that their immigration levels, around 20 % of the general population, are higher than the OECD average and also higher than in many countries where immigration causes much greater controversy and hostility than in either Canada or Australia (see Graph 2.14 on p. 52). So it appears that **sustainable and harmonious immigration is not a numbers game. A certain country may find it difficult to integrate even a small percentage of immigrants while other countries can accommodate larger numbers without causing strong social tensions. What matters is the institutional framework and the economic model** in each particular country. There are certain features of Canadian and Australian immigration policies which, in our view, make them successful:

- Immigration into both Australia and Canada is, **first and foremost, labour migration,** i.e. people who choose to migrate there make a decision to do so, based on the demand that exists in the labour market. They often have a job offer before they decide to relocate.
- The economic models of Australia and Canada, as well as their traditions, make the two countries favourable destinations for dynamic and entrepreneurial people from other places. **High levels of economic freedom** in Australia and Canada (number 6 and 5 in the EFW 2012 rating) create an environment where immigrants have opportunities to both improve their own conditions and to contribute to the overall wellbeing of society.
- Australia and Canada have had a very **balanced pace of immigration**. Their immigration percentages have been steady for a very long time. Data that is available through World Bank covers a period of half a century from 1960 to 2010. Over that period, immigration levels were consistently around 15–20 % of the population. From the point of view of cultural adaptation, such a balanced policy appears to be more sustainable than large immigration hikes, such as, for example, the rapid inflow of immigrants into the Gulf Arab countries (see Graph 2.12 on p. 51).

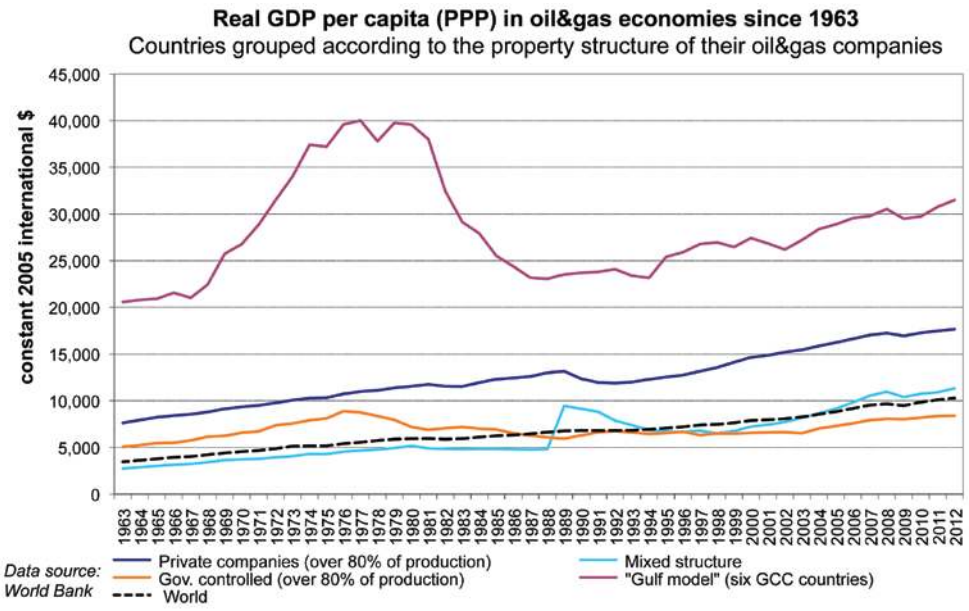
Strong institutions and efficient immigration policies have allowed Australia and Canada to further foster innovation by attracting a pool of global talent.

To summarize, **strong institutions and efficient immigration policies have allowed Australia and Canada to further foster innovation by attracting a pool of global talent.**

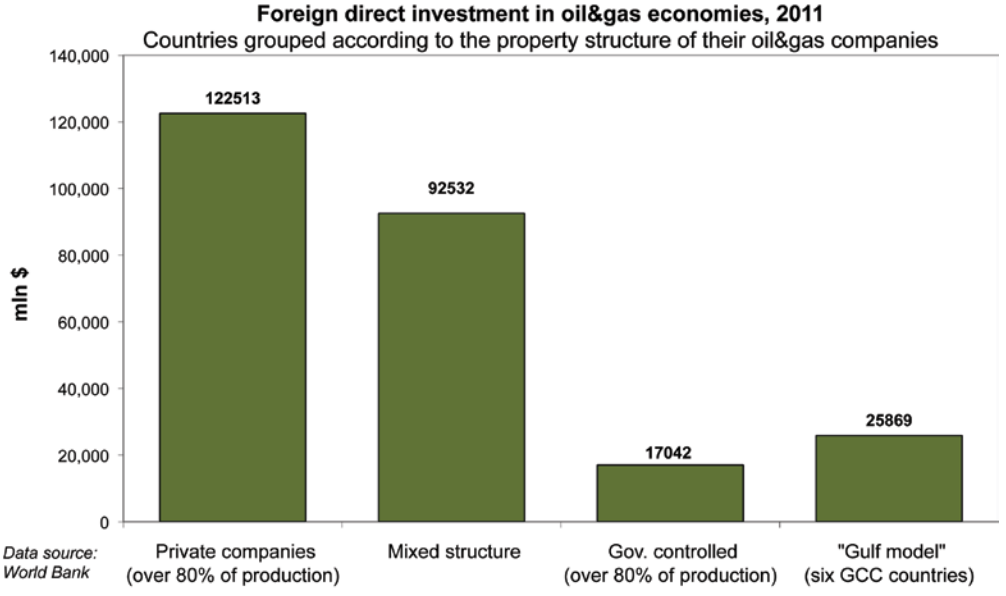
Within a certain policy framework, and under proper institutional conditions, demand for labour in resource economies can be partially satisfied by immigrants. Whether this is a feasible policy option in each particular country depends on a variety of factors, most of which are political and cultural rather than economic. Multiple examples throughout history demonstrate that countries which competently managed an inflow of entrepreneurial and creative people from other countries outperform countries which develop in autarchy.



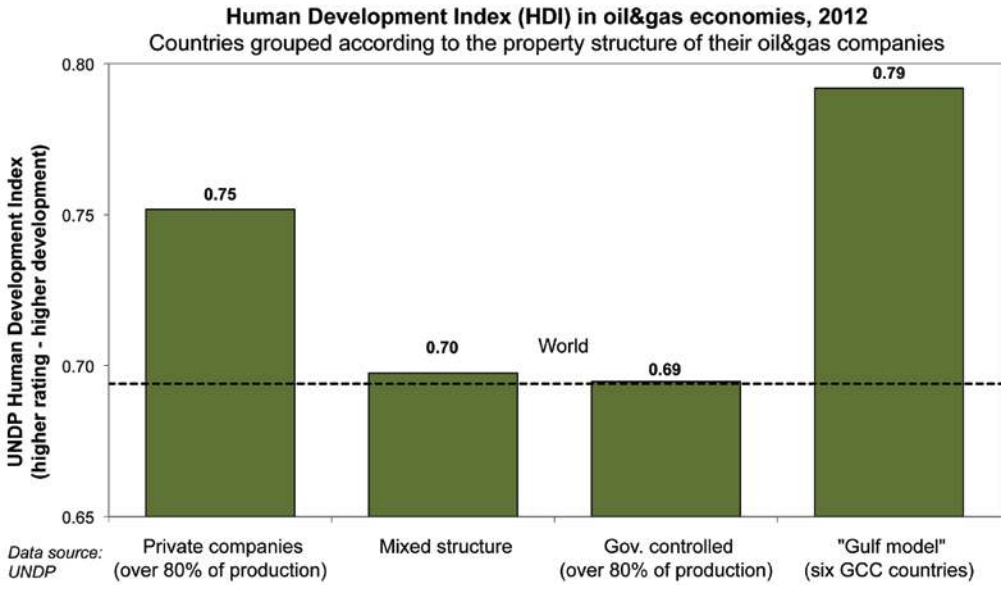
Graph 2.1



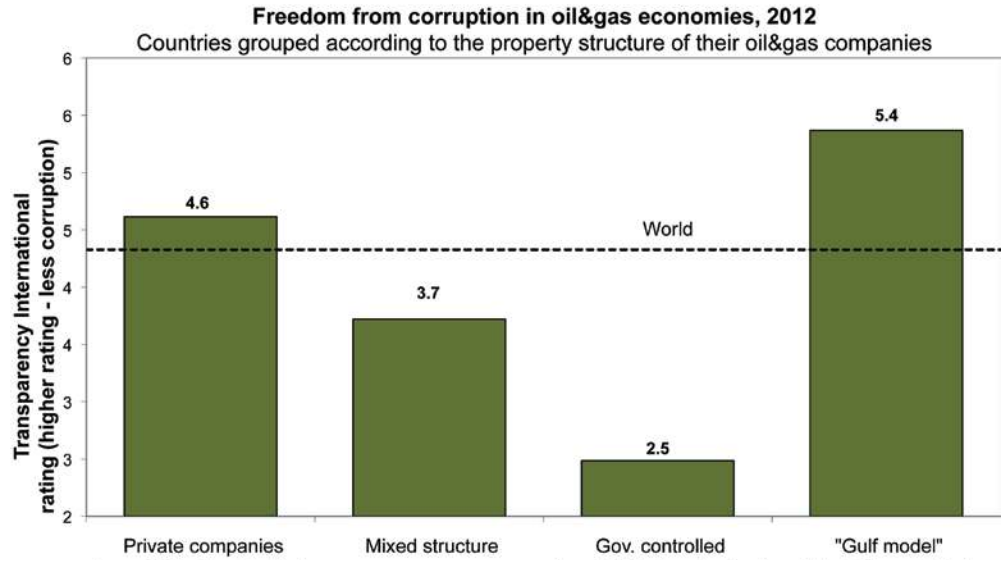
Graph 2.2



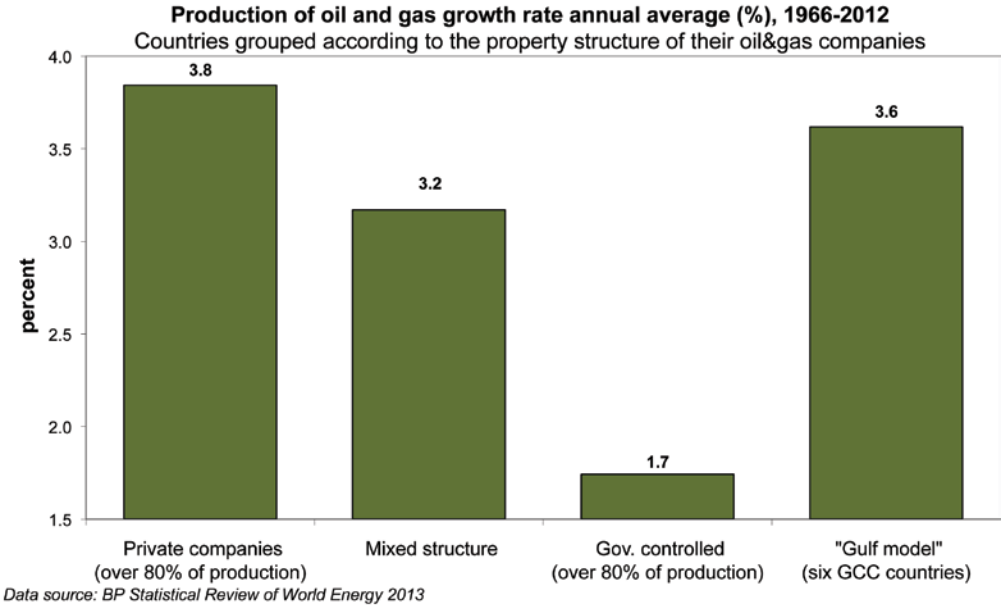
Graph 2.3



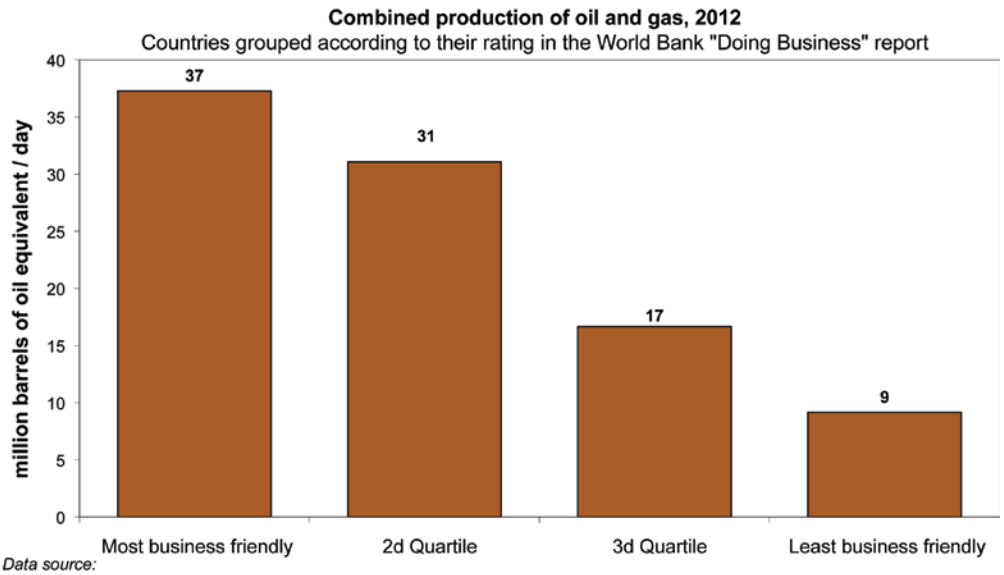
Graph 2.4



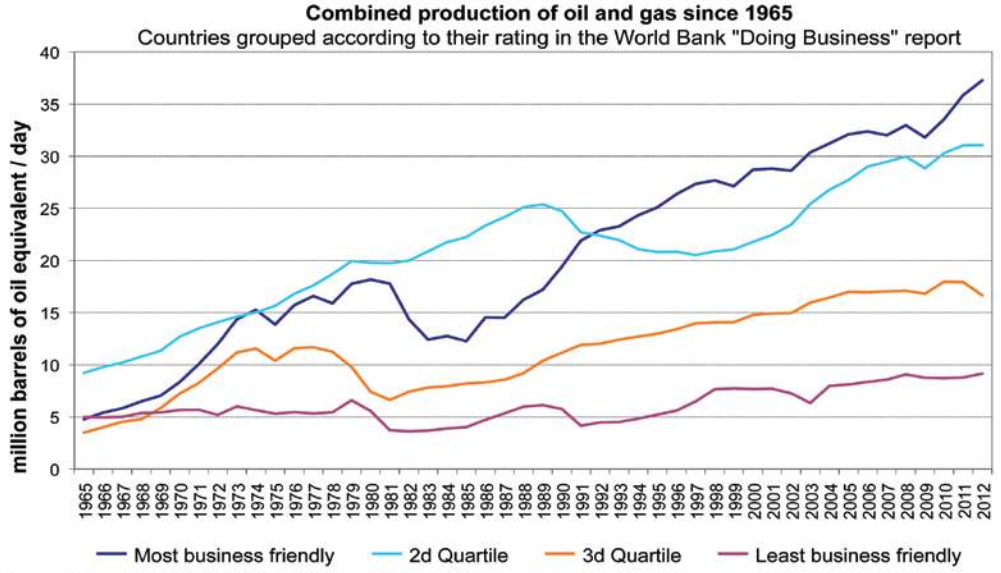
Graph 2.5



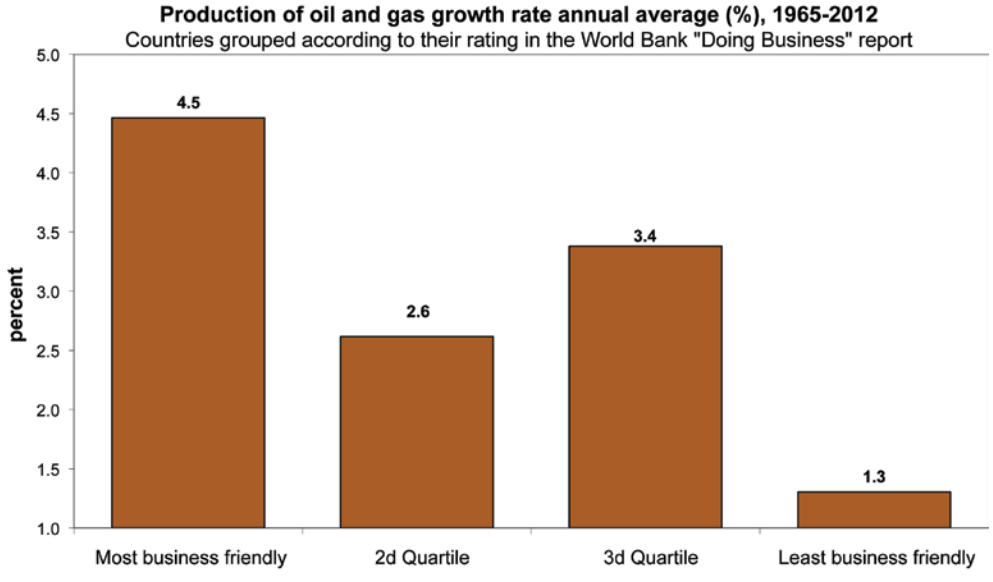
Graph 2.6



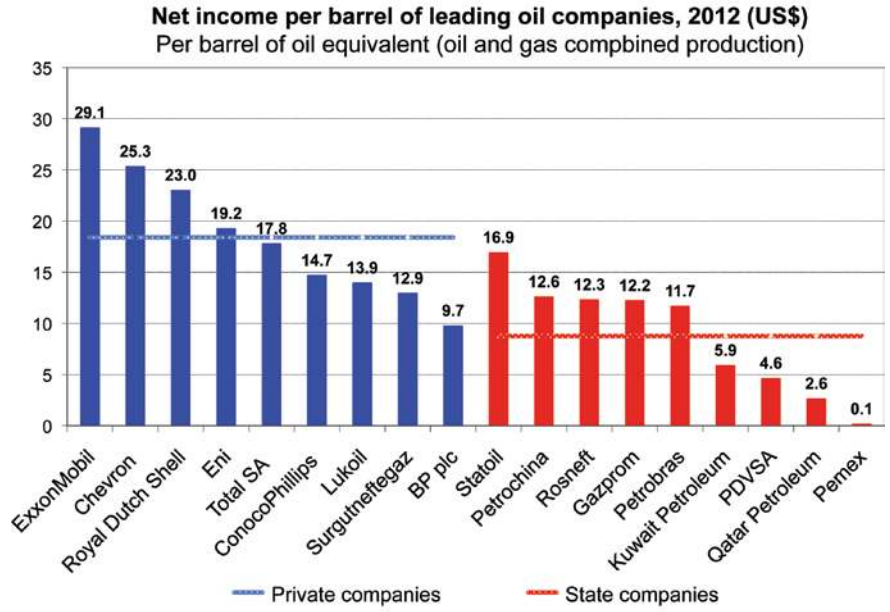
Graph 2.7 *Data source: BP Statistical Review of World Energy 2013*



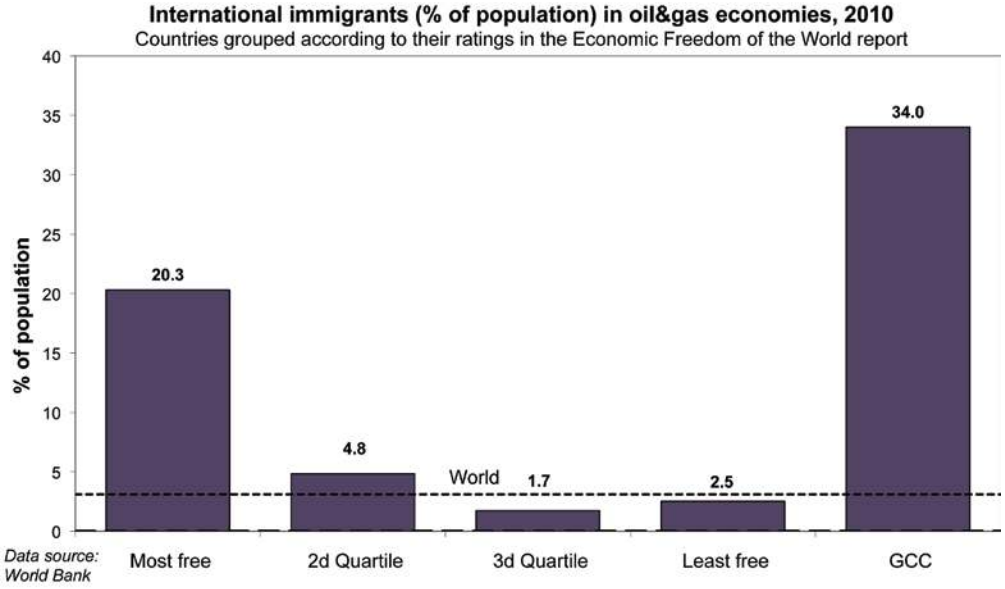
Graph 2.8 *Source: BP Statistical Review of World Energy 2013*



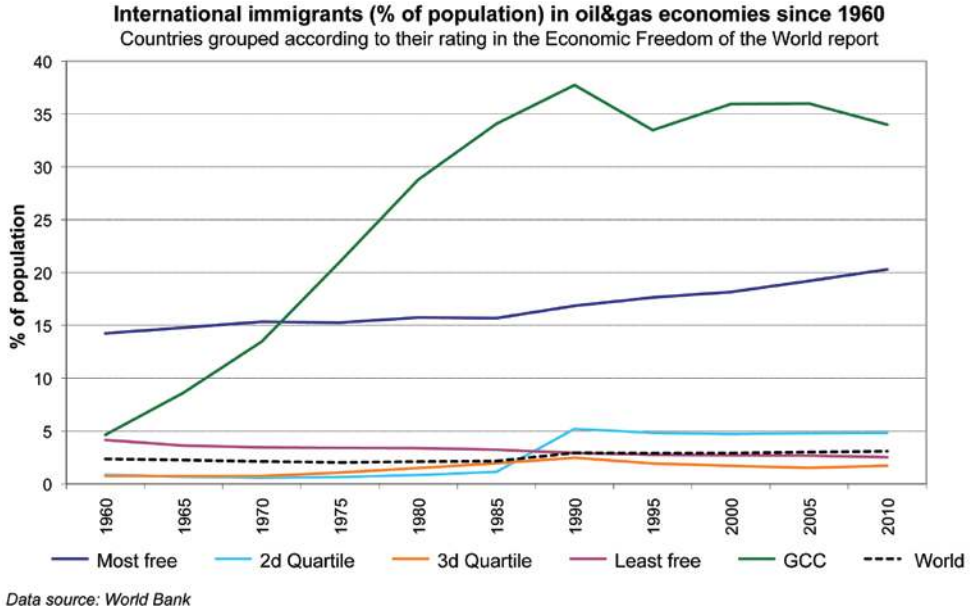
Graph 2.9 *Data source: BP Statistical Review of World Energy 2013*



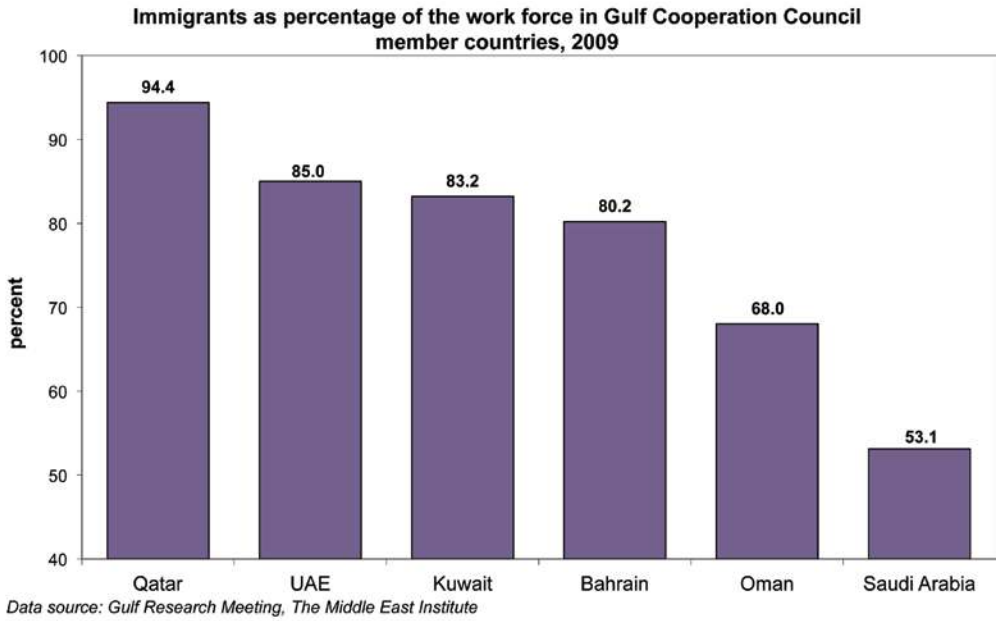
Graph 2.10



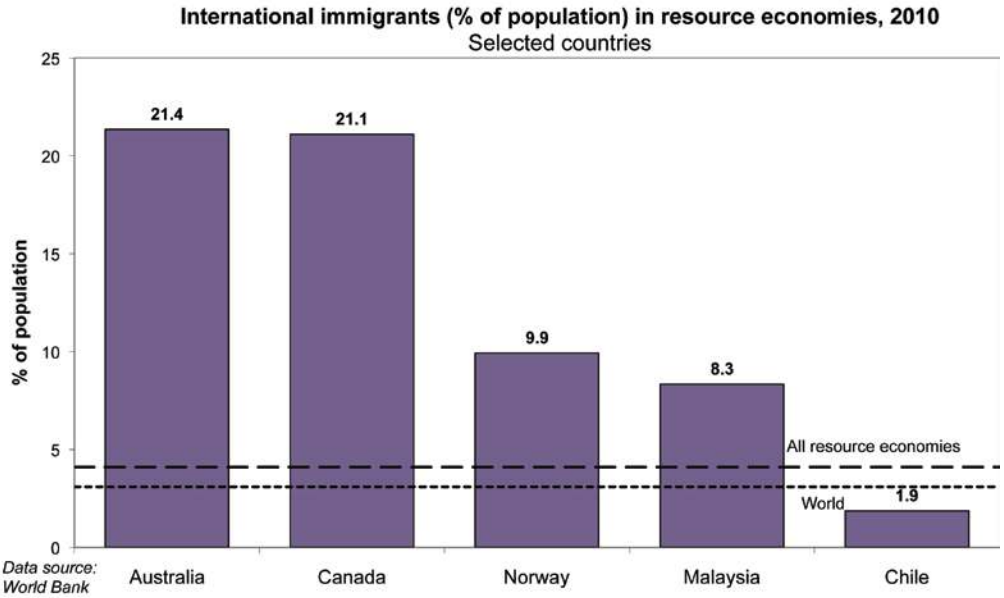
Graph 2.11



Graph 2.12



Graph 2.13 *Data source: Gulf Research Meeting, The Middle East Institute*



Graph 2.14 *Data source: World Bank*

SECTION THREE: Experience

Five resource-exporting countries which managed to achieve high levels of economic and social development.

Australia

Following a series of economic reforms which started in the mid-1980s, Australia began a period of rapid economic growth which exceeded its peers in the OECD club. Before the reforms were launched by Paul Keating, Australia's then treasurer, the country was seen by many as gradually moving towards the periphery of the global economy. Some of the key reforms undertaken in Australia included new regulation of the labour market to increase its flexibility, and lower taxes, as well as reform of the financial system to enable it to meet the financing needs of the economy, and make it more attractive to investors, both domestic and foreign. Importantly, the government liberalised the system of mineral licensing and permits, which boosted investment in greenfield exploration.

Minerals account for 70 % of the value of Australia's exports and about 12 % of its GDP. An additional 9 % of the economy consists of services which are linked to energy and mining. All in all, that makes Australia a resource economy. Furthermore, the share of extractive industries has been growing. Industry analysts expect Australia to triple its gas production by 2020 and overtake Qatar as the world's largest LNG producer as Australia's conventional and unconventional gas projects come on-stream. Hydrocarbons aside, Australia is the world's second largest producer of gold, nickel, and zinc, the third largest producer of iron ore and uranium, and the world's fourth largest producer and the leading exporter of coal.

Contrary to the "resource curse" hypothesis, Australia did not fall victim to commodity price volatility or global economic turmoil.

Contrary to the "resource curse" hypothesis, Australia did not fall victim to commodity price volatility or global economic turmoil. Australia was not dragged down by the financial crisis in Asia in 1997. Neither did it go into a recession like most other industrialised nations during the financial meltdown of 2008–2009. **Consistent reforms, strong property rights, innovation-friendly policies and low barriers to business allowed Australia to become one of the leaders in economic growth and social development.** Graphs 3.1–3.6 on pp. 63–64 compare Australia's performance with that of other resource economies.

Key components of Australia's economic model:

One of the world leaders in economic freedom. Australia ranks 6th in the Economic Freedom of the World rating and 10th in World Bank's Doing Business rating. It also has the 10th highest GDP per capita (PPP) in the world. The country has a highly developed framework of economic, social and political institutions. That allowed Australia to maintain a highly diversified economy and avoid the pitfalls of the "Dutch disease".

Sector structure. Australia's extractive industries are diverse, and consist of various players from world supermajors like BHP Billiton, to independent exploration companies. Australian companies have also established themselves as active global explorers, especially in the mining industry. The sector is fully competitive and completely private, with no state companies in either energy or mining.

Property rights and mineral licencing. Property rights of mineral licence-holders are secure, and access to new exploration and production licences is transparent, uncomplicated, and free of red-tape.

Location. Australia uses its geographical location to its maximum advantage: three quarters of all of its exports are destined for Asia. Australia's business people and policy-makers long ago realised the economic importance of Asian countries and consequently developed the requisite relations at an early stage.

Consistent reforms, strong property rights, innovation-friendly policies and low barriers to business allowed Australia to become one of the leaders in economic growth and social development.

Innovation. Australia has been a pioneer in many areas, including the world's first floating LNG facility (Prelude FLNG) which is under development in the North West Shelf area. It also became a leader in the production of coal bed methane. Australia's innovation is helped not least by a pragmatic immigration policy, which attracts talented and entrepreneurial people from all over the world.

Canada

Canada is often mentioned as a role model of economic growth and social development for other resource economies. Canada's resource reliance is somewhat less than that of Australia, but nonetheless Canada's economic growth has been to a large degree driven by its mineral sector, especially since the shale oil breakthrough. Canada's overall mineral exports account for 35 % of the value of its overall exports and around 10 % of its GDP.

According to the Canadian government (Natural Resources of Canada, 2011 Report), the energy sector is the greatest contributor to Canada's balance of trade and a major job creator, employing more than 550,000 people. In 2012 alone, $55 billion were invested by domestic and international businesses into Canadian hydrocarbon projects. Sufficient advances were made in technologies which enabled the commercial production of Canadian shale oil. Many of the deposits of shale oil had been identified long before their development became economically feasible. Technological progress allowed companies to book those deposits as commercial reserves and start production.

Canada's mining sector is another locomotive of economic growth. Foreign direct investment into mining has been at the level of $50 billion and $70 billion annually in the second half of 2000s (for details see the chapter dedicated to Canada in the report "Fostering Foreign Investment in Mineral Exploration and Development in Russia", 2011). Not only is mining output growing domestically, but it is also spilling over internationally through multiple Canadian firms' investments in mining projects in emerging markets. Remarkably, **Canadian companies account for between 30 % and 45 % of total global exploration activity in the mining sector worldwide.** That overseas investment expansion may be seen as another way of mitigating the "Dutch disease" effect. In addition, Canada is using sovereign funds to hedge government finances against commodity price volatility and sterilise part of the export incomes. The largest sovereign fund in Canada is the Alberta Heritage Savings Trust Fund. Last but not least, **the Toronto Stock Exchange is the world's leader in extractive industries: more mining and oil companies are listed there than on any other exchange in the world.** Graphs 3.1–3.6 on pp. 63–64 compare Canada's performance with that of other resource economies.

It is worth noting that Canada has a peculiar system of mineral rights ownership. Although ownership of most mineral resources in the ground lies with either provincial or the federal governments, where land ownership was ac-

Canadian companies account for between 30% and 45% of total global exploration activity in the mining sector worldwide.

The Toronto Stock Exchange is the world's leader in extractive industries: more mining and oil companies are listed there than on any other exchange in the world.

quired by private companies or individuals prior to 1887, it also includes subsurface rights that continue to be owned as freehold mineral rights to this day.

Key components of Canada's economic model:

One of the world leaders in economic freedom. Canada ranks 5th in the Economic Freedom of the World rating and 17th in World Bank's Doing Business rating. It also has the 9th highest GDP per capita (PPP) in the world. The country has a highly developed framework of economic, social and political institutions.

Sector structure. Canada's conventional and unconventional hydrocarbons are developed by a range of companies, domestic (Athabasca Oil Corp, Canadian Natural Resources etc.) and international (Shell, Conoco Philips etc.). Extractive industries are fully competitive and completely private with no state companies in either energy or mining. Canadian mining companies are operating both in Canada and on a worldwide scale.

Property rights, mineral licencing and taxation. Property rights of mineral licence-holders are secure and access to new exploration and production licences is transparent, uncomplicated, and free of red-tape. Canada's mineral tax regime is profit-based and is generally lower than in most other jurisdictions.

Location. Canada benefits from its proximity to its biggest trade partner, the United States. It is also expanding its mineral exports in other regions.

Innovation. Canada is currently the biggest producer of shale oil in the world. The country is at the forefront of technological innovation in unconventional hydrocarbons. Canada's institutional strength has allowed it to become a world-wide financial hub for hundreds of mining companies which list their shares on the Toronto Stock Exchange.

Chile

Chile today is the largest producer of copper, natural nitrates, iodine, and lithium, as well as the second largest producer of molybdenum, the fifth largest supplier of silver and thirteenth largest producer of gold.

It is remarkable how Chile's economy reacted to global copper prices in conjunction with the government policies of the day. In 1971 the government of Salvador Allende nationalised all copper mines in Chile, along with banks and various companies in the manufacturing sector. That caused

an exodus of foreign capital and a suppression of domestic investment. Despite a strong increase in copper prices in the early 1970s, real GDP declined during the Allende regime. Inflation was at 100 % a year and the real exchange rate of the Chilean peso appreciated significantly. A period of severe economic and political instability led to the overthrow of the Allende government in 1973.

In the 1990s, following the success of mining reforms, the private concession system was extended to the Chilean infrastructure sector (highways, airports and ports), which had traditionally been deemed "public works" carried out by the state.

The military government, under Pinochet, instituted a resolute anti-inflation program and devaluated the real exchange rate. Unlike the first copper price increase, Chile's second copper export boom, which occurred in 1979–1980, was accompanied by substantial growth in real GDP. Even after the decline of copper prices in 1981, GDP grew by about 5 % annually during the remainder of the 1980s, and there was only a modest appreciation of the real exchange rate. Moreover, Chile's stable institutional and regulatory framework kept investors onboard during Latin America's turbulent economic conditions in the 1990s, allowing the country to outperform its regional peers.

The mining sector reforms were crystallised in Chile's 1981 Constitutional Mining Law (note that the term "constitutional" makes the law as immutable as the Constitution). The law is a one-stop legislative shop for potential investors, outlining the rights and obligations of concession-holders. **In the 1990s, following the success of mining reforms, the private concession system was extended to the Chilean infrastructure sector (highways, airports and ports), which had traditionally been deemed "public works" carried out by the state.** Graphs 3.1–3.6 and 3.8 on pp. 63–65 compare Chile's performance with that of other resource economies.

Key components of Chile's economic model:

One of the world leaders in economic freedom. Chile ranks 11th in the Economic Freedom of the World rating and 37th in the World Bank's Doing Business rating. Chile is the only country in South America which is a member of the OECD. The strength of Chile's institutions and its favourable investment climate have made it the most successful Latin American economy.

Sector structure. Chile's mining sector has a mixed property structure. Due to political pressures, during mining sector reforms in the early 1980s it was decided that the biggest copper mining company, Codelco, would remain majority state-owned. But copper production, which rose fivefold in the last 20 years, grew fastest among private companies. As a result, today, government-owned Codelco controls less than a third of overall copper production in Chile.

Property rights and concessions. Chile's 1981 Constitutional Mining Law became a worldwide industry gold standard for concession-holder protection. It treats a concession as private property and allows concession-holders to develop a mine in accordance with their strategy and market conditions. It also provides strong protection against expropriations.

Government stabilisation policies. The government retained export windfalls in a stabilisation fund and prevented the non-mining tradable sector from being suppressed by the effects of the "Dutch disease".

Malaysia

Malaysia's Prime Minister Najib Razak believes that his country may become a developed economy (i.e. be admitted to the OECD) by the year 2018. Currently, with a GDP per capita (PPP) of $17,675, it is already one of the most prosperous countries in Asia, and qualifies as a so-called "newly industrialised economy". Malaysia's economic policies have undergone a significant evolution since the country gained independence in 1957. Initially, Malaysia pursued a then popular strategy of government-directed industrialisation and centrally planned economic development. Elements of that model, such as government subsidies and significant shares held by the government in several sectors, are still present in the Malaysian economy to this day. But gradually, the government started to liberalise and open up the economy by adopting more market-centered policies. One important characteristic of Malaysia's economy is its adaptability. Natural resources have always been a large part of Malaysia's exports. Originally, Malaysia was the leading exporter of tin, palm oil and rubber, but in the early 1970s oil and natural gas overtook them as the main export commodities.

Malaysia's strategy could be seen as "clever" diversification, when instead of trying to run away from its resource base and its competitive advantage, the country fine-tuned its economy to developments in the global market. Oil overtook tin as a main export commodity just in time, immediately before the collapse of the tin market in the early 1980s, preventing a plunge in export earnings. As oil reserves started to decline, Malaysia commercialised its natural gas resources by joining the LNG market and becoming one of the leading exporters of liquefied natural gas. Another stage of diversification started when the national oil company, Petronas, went global. The company has been building up its project management expertise, which it acquired in joint operations with international companies. At a certain point, Petronas started to leverage its experience, as well as its position as an Asian national oil company representing a Muslim country. It embarked on a number of projects in Asia, the Middle East, Africa and Central Asia. **Today, industry experts agree that Petronas is the**

most efficient national oil company. Its performance indicators, such as net income per barrel of oil equivalent, speak for themselves: $25.5/barrel at the same level as Chevron and above that of Shell. Graphs 3.1–3.7 on pp. 63–65 compare Malaysia's performance with that of other resource economies.

Key components of Malaysia's economic model:

Medium high level of economic freedom and one of the world leaders in the Doing Business rating. Malaysia ranks 68th in the Economic Freedom of the World rating and 12th in World Bank's Doing Business rating. The Economic Freedom of the World rating evaluates countries based on 42 different measurements. Malaysia's rating is strengthened by low barriers to business, but is worsened by a relatively large government sector – mostly due to the state-owned Petronas.

Sector structure. The current model of the extractive industries could be described as a symbiosis between state and private companies. Although the government maintains a 100 % ownership of Petronas, the national oil and gas champion, the overall government share in oil and gas production is about 60 %. The remaining part is divided between various international and national oil companies, such as Shell, ExxonMobil, Murphy Oil and Nippon Oil, all of which operate through production sharing agreements with Petronas.

Production sharing contracts and security of tenure. Under the current production sharing contract terms, Petronas has the right to a carried interest in exploration blocks developed jointly with foreign partners. Petronas' share is negotiable and usually varies between 15 % and 25 %. Security of tenure is high, and there have been no licence revocations or abrupt changes of contract terms.

International expansion. Petronas' overseas projects account for 36 % of its total hydrocarbon production. Petronas operates in over 30 countries, producing oil from about 50 projects, more than half of which it operates. Bringing about strong international opportunities allowed Petronas to effectively manage the lowering of its production levels in mature areas of Malaysia.

Government stabilisation policies. The government operates several sovereign funds, such as Khazanah Nasional Berhad, the Employees Provident Fund and Permodalan Nasional Berhad. They have allowed Malaysia to avoid high inflation and currency appreciation. Sovereign funds also enable the government to hedge its social obligations against commodity price drops.

Today, industry experts agree that Petronas is the most efficient national oil company. Its performance indicators, such as net income per barrel of oil equivalent, speak for themselves: $25.5/barrel at the same level as Chevron and above that of Shell.

Norway

Norway's GDP per capita (PPP) is the fourth highest in the world. Up to a quarter of national income is generated by oil and gas production – the largest in Europe. Despite its reliance on mineral exports, Norway managed to avoid economic overheating and successfully mitigated the effects of oil price volatility, thanks to disciplined and efficient policies. **Norway's policy framework for managing revenues from hydrocarbon exports, especially the Government Pension Fund, are used as models by several resource-abundant countries.** These policies are actually relatively new, as although oil was discovered in Norway in 1969, it was not until the early 1980s that crude production started to generate a positive income.

Until 1981, when a Conservative government replaced the Labour Party, Norway's economic policies had been predominantly state-lead and included subsidised industrialisation, rationing and price controls. Inflation was high and real income growth low. The new government introduced a degree of deregulation and limited economic liberalization, which played an important role in attracting investment into the hydrocarbon industry. Today, Norway continues to maintain a large welfare state, but the current model is different from the pre-1981 one in one critical aspect: it is based on fiscal responsibility and financial discipline. In short, Norway chose a model with a large government which it actually can afford. Such a welfare state model is different from many other Western countries, where welfare obligations are financed though government borrowing and using the central bank's printing press.

Another important feature of Norway's model is prudent and strategic management of its natural resources. Following a decline in oil production due to depletion of mature fields, natural gas production has risen to reach 10 bn cubic feet a day, more than five times what it used to be 20 years ago. Furthermore, Statoil's international operations allow Norway to leverage its operational expertise in other regions, while compensating for the decline in domestic oil production and pre-empting a peak in Norway's natural gas production, expected in about ten years from now. Graphs 3.1–3.6 on pp. 63–64 compare Norway's performance with that of other resource economies. (For statistical information see Ministry of Petroleum and Energy. "Facts – The Norwegian Petroleum Sector. 2011").

Norway's policy framework for managing revenues from hydrocarbon exports, especially the Government Pension Fund, are used as models by several resource-abundant countries.

Key components of Norway's economic model:

High level of economic freedom and one of the world leaders in the Doing Business rating. Norway ranks 23rd in the Economic Freedom of the World rating, 6th in World Bank's Doing Business rating

and 1st in the UNDP Human Development Index. Its institutional system is considered to be one of the most reliable and developed in the world.

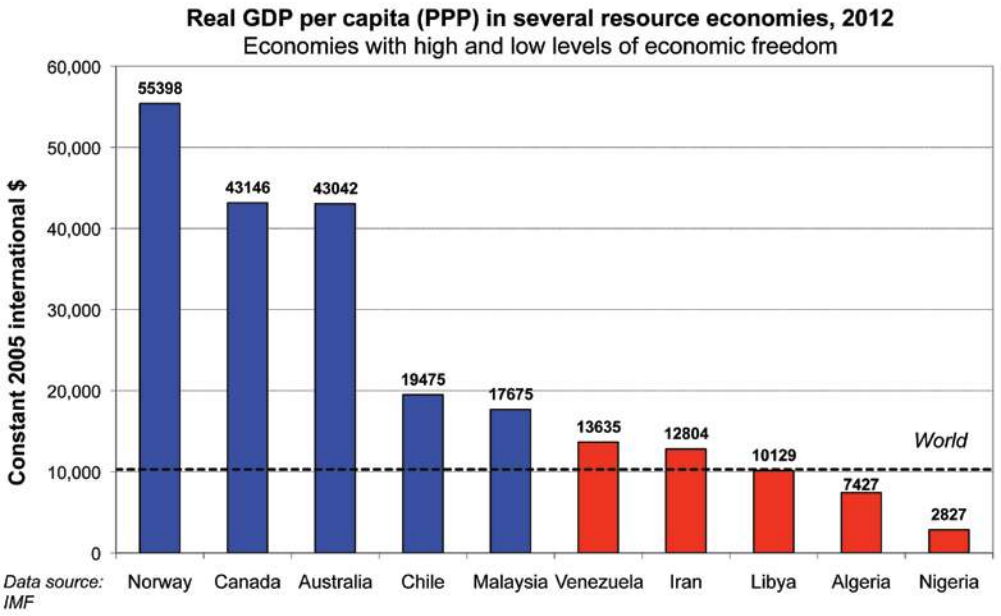
Sector structure. Through national companies, Statoil and Petoro, the government controls around 60 % of oil and gas production and around the same share of reserves. The remaining share is divided between various international companies, such as ExxonMobil, Total, Shell and Conoco Philips.

Security of tenure and tax regime. Security of tenure is strong. The tax system for oil and gas projects is straightforward and has remained largely unchanged for the last 20 years.

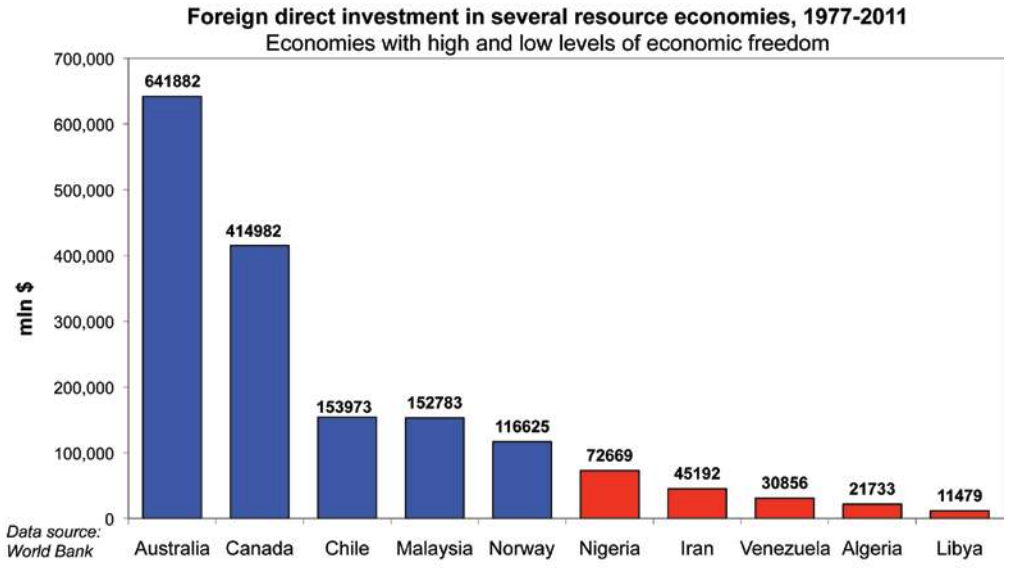
Operations worldwide. Statoil participates in oil and gas projects in 15 countries, including joint ventures with Rosneft on the Arctic shelf and in the Far East.

Government stabilisation policies. A large part of the state income from oil and gas exports is diverted into the Government Pension Fund of Norway. It is the second largest sovereign fund in the world; second only to the Abu Dhabi Investment Authority. The overall value of its assets is 1.5 times Norwegian GDP and it controls over 1 % of all publicly traded shares in the world.

For some comparative statistics on countries' performance see Illustrations for Section 3 below.



Graph 3.1



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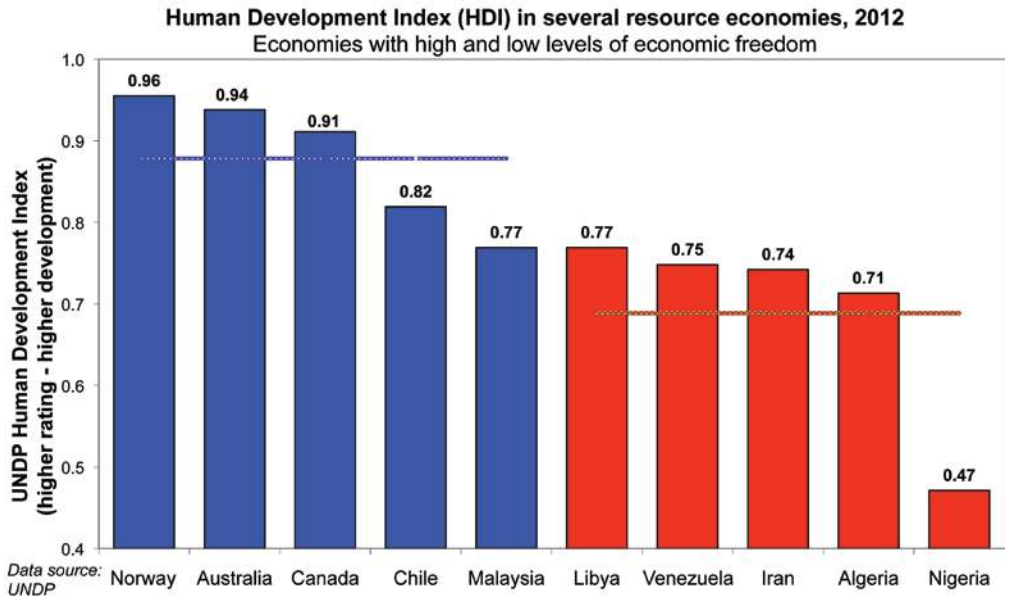

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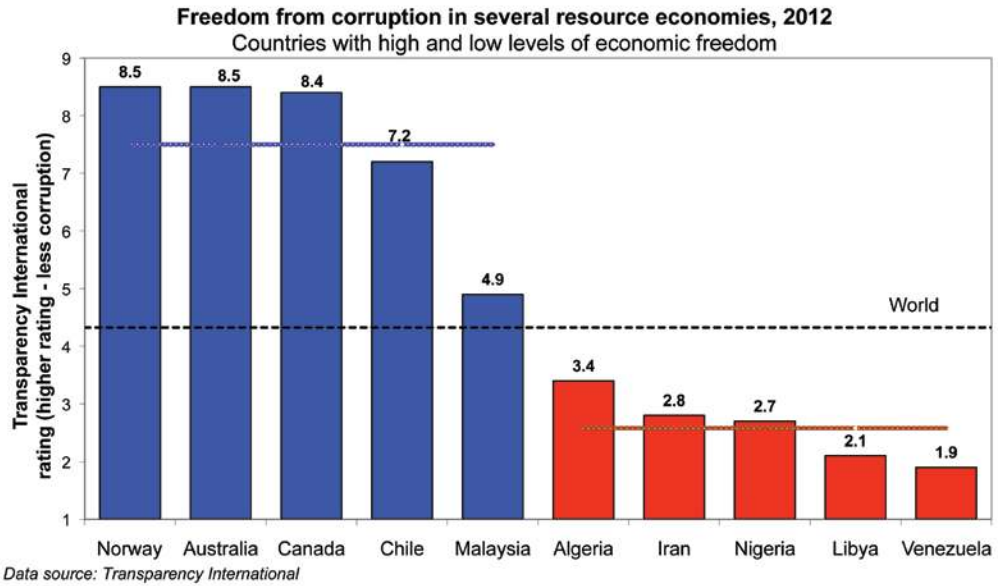

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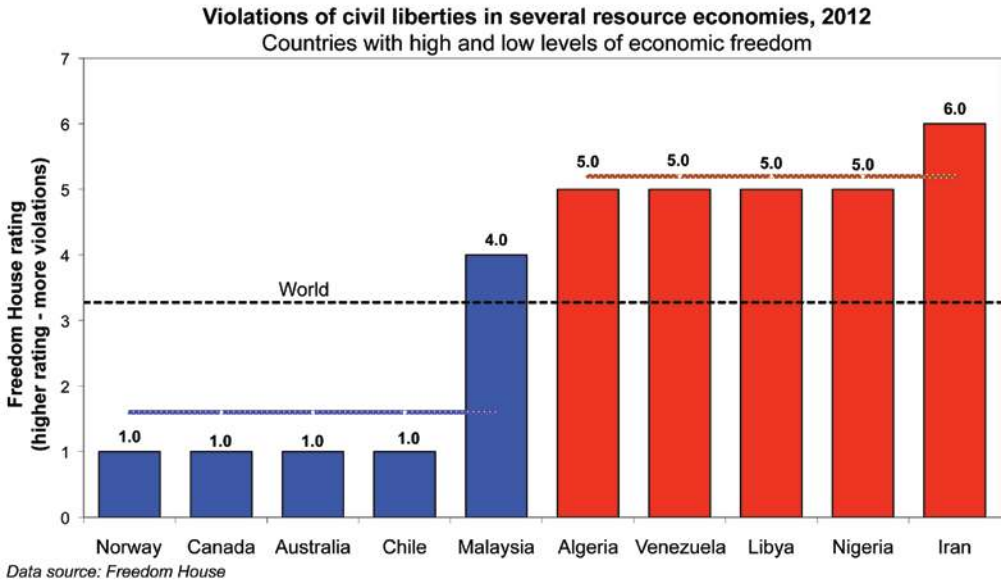

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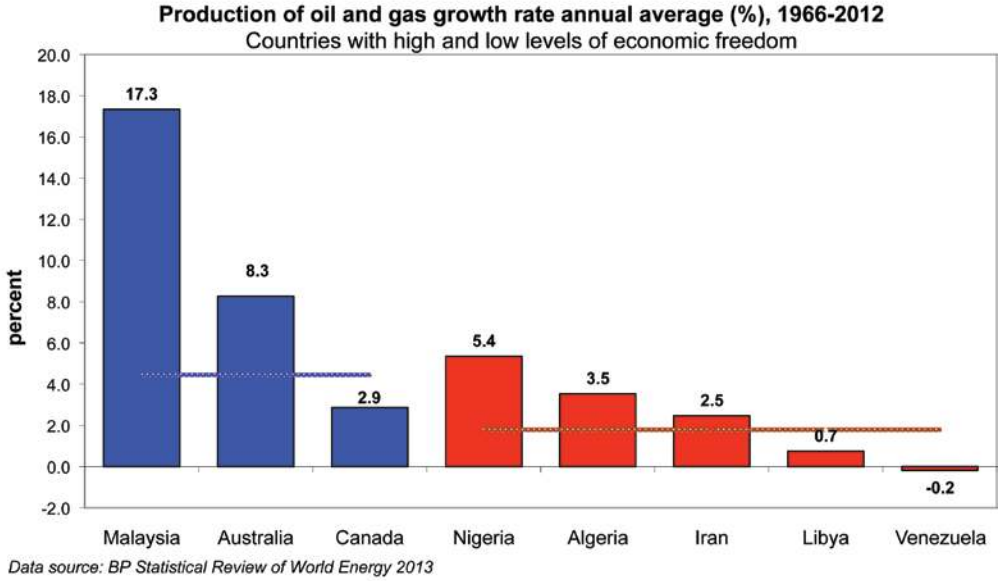

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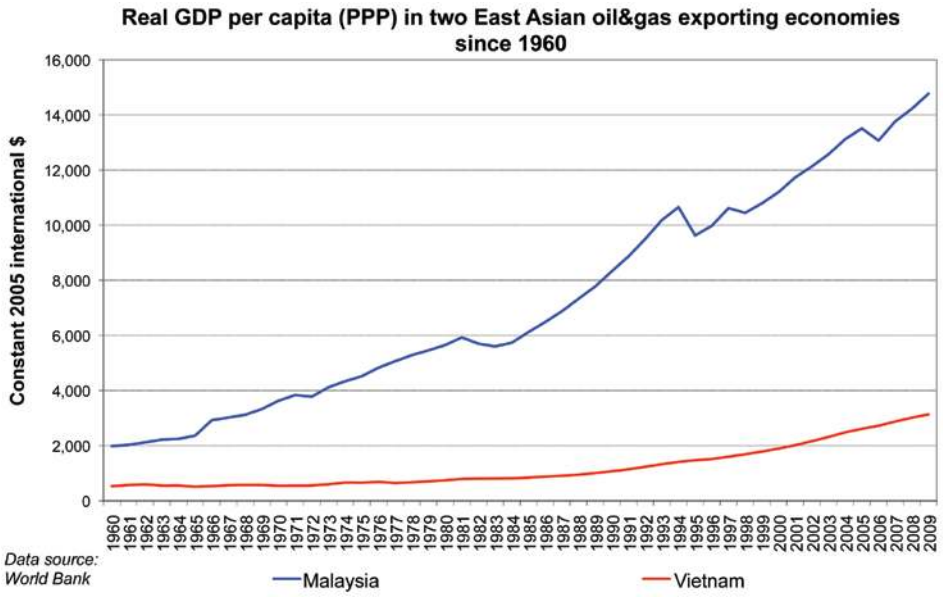

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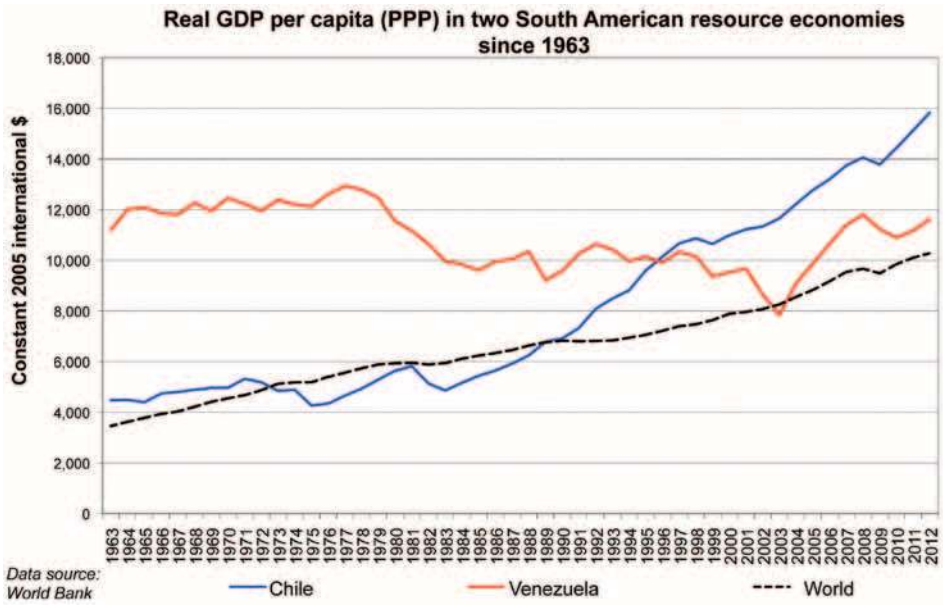
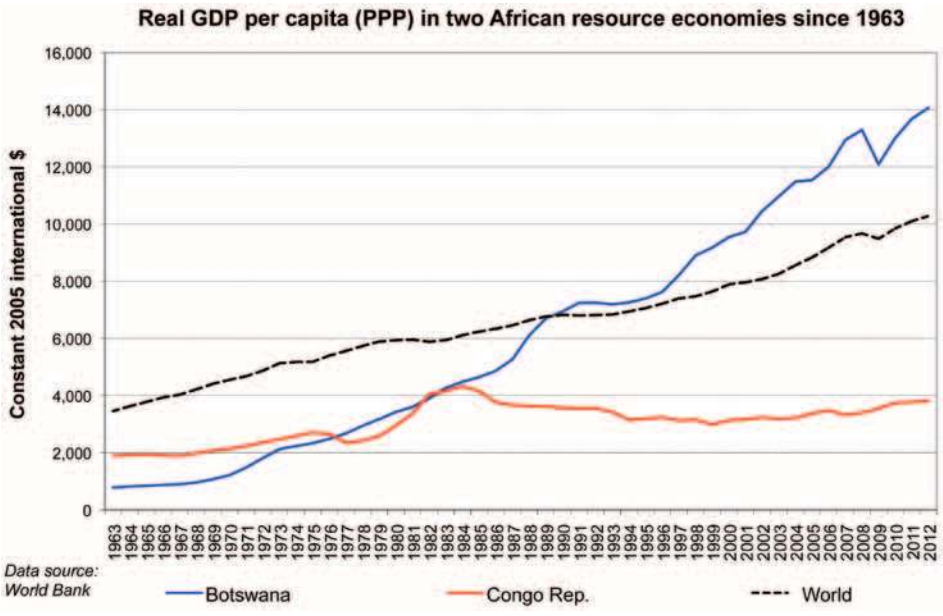
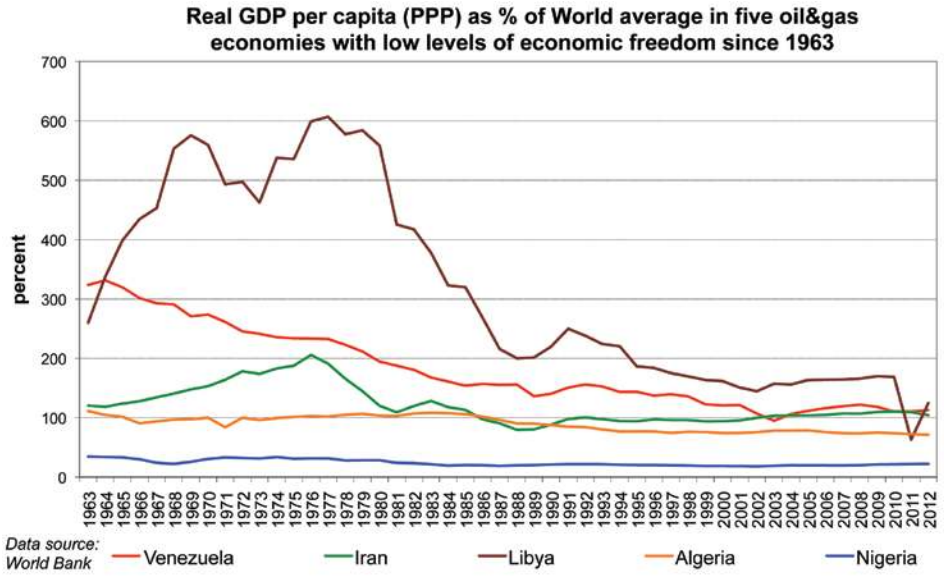


Graph 3.8



Graph 3.9


Real GDP per capita (PPP) as % of World average in five oil&gas economies with low levels of economic freedom since 1963
percent
700
600
500
400
300
200
100
0
1963 1964 1965 1966 1967 1968 1969 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012
Data source: World Bank
Venezuela
Iran
Libya
Algeria
Nigeria

Graph 3.10

SECTION FOUR: Summary and recommendations

4.1. Main report findings – an overview

This report presents the argument that resource economies with better economic and political institutions are more capable of managing their resource revenues, and can achieve superior results in economic growth and social development. To support that argument, we have used empirical evidence and analysed the relevant research that has been conducted on the subject to date. We are generally skeptical of the "resource curse" hypothesis, and the idea that mineral exporting countries are doomed to stagnation. We argue that instead of battling with various "curses" and "diseases", governments would do a better job by looking inwards and analysing their own performance, along with the institutional conditions in the economies that they govern. It is the quality of institutions which essentially determines whether natural resource abundance is a blessing or a curse.

Rent-seeking, regulation and economic growth

One of the main patterns of many resource economies is rent-seeking. It is not a unique feature of resource-abundant countries, but it does appear to have a particularly strong effect on them and produce institutional weaknesses. Several reasons can be given why resource economies are vulnerable to rent-seeking. Such reasons include effective government control – much higher in the mineral industry than in other sectors – as well as resource nationalism, greater levels of redistribution, and insulation of the elite. Rent-seeking in resource economies is one of the main hindrances to economic growth and social development. Some areas of regulation are essential for a well-functioning institutional system, such as strong prop-

erty rights guarantees, independent courts, or law enforcement agencies. However, the further a specific area of regulation is removed from the core functions of government, the more likely it is to have a negative effect on economic growth. Regulation possesses a "multiplier effect" which can be either positive or negative; efficient regulation which reinforces the rule of law can boost economic development, while even small regulatory agencies can do a lot of harm through red tape, bottlenecks and market distortions.

The role of institutions and economic freedom

Comparisons conducted by the Fraser Institute Economic Freedom of the World project demonstrate that economic growth and social development across all countries surveyed strongly correlates with economic freedom. Our analysis indicates that, in resource exporting countries with higher levels of economic freedom, both real per capita income and human development scores are higher, people live longer, there is more investment, more political freedom, and civil rights. Higher economic freedom correlates with lower crime, corruption and illiteracy levels. The most important conclusion from our analysis is that the economic and social performance of resource economies depends primarily on the strength of their institutional framework, of which economic freedom is the best measurement.

Government's share of ownership

The success of Australia and Canada, which, on the back of a surge in hydrocarbon production, have enjoyed rapid economic growth over the recent years (while most other OECD countries have struggled with a recession), as well as the "shale gas revolution" in the US, demonstrate the advantages of private ownership in the energy sector. Our analysis indicates that there is a strong trend towards higher income per capita in countries which have privately-owned oil companies, and lower levels of real GDP per capita in countries with fully government-controlled sectors. Furthermore, the average income per barrel of oil equivalent produced by the nine largest privately-owned oil companies is more then double that of the nine largest state-owned oil companies. While private companies generally outperform state-owned firms, performance also varies strongly among government enterprises. Under certain conditions, and within the right policy framework, some state corporations manage to achieve impressive results. What matters is the way a particular company is organized, and, even more importantly, the overall institutional environment in which it operates. State-owned firms which rely on strong and lasting partnerships with international companies tend to perform much better than government enterprises which develop in autarchy. The best example is Malaysia's Petronas, which is state owned and has for decades relied on alliances with foreign companies to effectively run the Malaysian oil and gas sector, and rapidly grow its business both domestically and overseas. Interna-

tional alliances have allowed Malaysia to keep an edge in the global market by, for example, becoming a leading exporter of liquefied natural gas.

The role of innovation in extractive industries

Innovation is key to making gains in efficiency and getting ahead in competition. Innovation is therefore one of the key drivers of growth and social development. Unfortunately, innovation cannot be planned or directed by government decree, although many politicians would like us to believe that it can. It is not a coincidence that a breakthrough in unconventional hydrocarbons (i.e. shale oil, shale gas, and coal bed methane) took place in countries which are in the top of the Economic Freedom of the World rating, namely Canada, the USA and Australia. The institutional conditions which allowed the "shale revolution" to happen should be carefully studied by policy-makers in other countries, especially in resource economies. In a nutshell, it was the combination of secure property rights, a favourable tax regime, transparent and efficient regulation, and minimal red-tape. Furthermore, economies which competently manage an inflow of entrepreneurial and creative people from other countries outperform countries which develop in autarchy. Strong institutions and efficient immigration policies have allowed Australia and Canada to further foster innovation by attracting a pool of global talent.

Diversification and the "Dutch disease"

In an effort to counter the effects of the "Dutch disease", governments often attempt to bolster the contracting non-resource manufacturing sector by using direct and indirect subsidies, such as price caps on fuels. Such subsidised dependent industries become increasingly inefficient, to the extent that they can drag their economies into an economic slowdown. Thus, what is initially marketed as a remedy often becomes a source of economic stagnation on its own. Both the "Dutch disease" and the impact of commodity price volatility are first and foremost institutional rather than purely economic problems. Both of them become problems under specific circumstances, which are usually associated with the lack of strong and transparent institutions. Diversification makes sense when it increases overall efficiency, which is hardly possible if the government is picking winners. The fact that a given economy is not diversified is the result of inadequate efficiency (and also bureaucratic red-tape), which prevents businesses from making a profit in other sectors. By pouring money into those sectors the efficiency problem is not resolved but aggravated.

Stabilisation funds and oil dividends

Stabilisation funds, if implemented properly, with the right level of self-discipline, may be a useful economic policy tool. They can serve the following purposes:

- Sterilising revenue inflows when commodity prices are high, to mitigate upward pressure on the national currency exchange rate, which is one of the main causes of the "Dutch disease".
- Managing price volatility risks, and maintaining public spending levels during downturns.
- Introducing some budgetary discipline, by capping government spending.

Whether a stabilisation fund achieves these goals depends critically on whether it is sufficiently insulated from political pressures. That, in turn, depends on the quality of institutions. If institutions are weak, and rent-seeking is rampant, a stabilisation fund will simply become another vehicle for redistributing mineral revenues into the hands of political cronies. Examples of successfully implemented stabilisation funds include Norway and Malaysia. Another broader question is whether people really need the government to manage resource revenues. Several economists have suggested that resource-rich countries should distribute part of their natural resource revenues directly to their citizens. It could be modelled on the oil dividend which has been paid annually to all residents in Alaska since 1983. If mineral wealth belongs to every citizen in the country then, one might argue, everyone has a claim to an equal share of that wealth. Although this idea has not yet gained broad support, it is worthwhile discussing it as a viable policy option.

4.2 . What is in it for Russia? Five practical examples of how international experience could be applied to Russia's situation

To better understand the various challenges facing Russia's mineral sector, it is important to look at its history and the structural phases of its development. Over the years, a number of Russian and international authors have analysed the evolution of Russia's oil and gas industry and the overall management of natural resources. Some of the deepest and most detailed studies on the subject were published by Valery Kryukov (see a list of his publications in the References section). Thane Gustafson presented a rigorous analysis of the history of Russia's hydrocarbon sector in his book "Wheel of Fortune: The Battle for Oil and Power in Russia" (Gustafson, 2012). A detailed study of mining regulation in Russia and its comparison with policies in other countries is available in the report "Fostering Foreign Investment in Mineral Exploration and Development in Russia" published by the Foreign Investment Advisory Council of Russia (FIAC) in cooperation with Kinross Gold Corporation (link available in the References section).

Below we look at five economic policy areas which represent the most significant challenges for the Russian energy sector and, to some extent,

This is in no way a complete list of industry issues. It is rather an example of how the institutional analysis used in this report can be applied to the situation in Russia.

for the mining industry as well. We offer a number of practical steps to deal with those problems using Russian and international experience. Note that **this is in no way a complete list of industry issues. It is rather an example of how the institutional analysis used in this report can be applied to the situation in Russia.**

1. A two-tier model for improving efficiency

The structure of Russia's oil and gas industry is such that the bulk of production comes from several major fields in which high rates of depletion have already resulted in a production decline; other fields will start to decline soon. As time passes, the reserves of highly productive fields are falling while reserves of difficult-to-develop oil and gas are increasing. The latter include viscous and heavy oil and bitumen and shale and low-pressure gas. In order to maintain production levels, Russia should first improve operational efficiency and recovery rates at major mature fields and secondly carry out exploration of new acreage on a large scale.

The existing industry structure does not generally allow to solve the above-mentioned issues. **In essence, Russia's extractive industries are suffering from the same problems as the economy in general. The single most important of these is inefficiency. A weak legal system, corruption, and red tape are holding back improvements in productivity which are critical for economic growth. Economic inefficiency is also an obstacle to achieving other development objectives, such as protection of the environment.** In addition, a specific problem for the hydrocarbon sector is the high concentration of exploration licences for new fields within major state oil and gas companies. Many of such fields remain unexplored as state companies are often delaying their exploration. It is quite clear that, due to a number of factors, a rapid transition from the current industry structure in Russia to a system which relies mostly on private ownership is not realistically achievable. Therefore, we would suggest a scenario under which overall sector efficiency is improved using two complementary models. That would require differentiating current deposits in accordance with the rate of their depletion and the costs of their development.

We suggest a two-tier approach which would divide existing deposits into two groups in accordance with their development costs: "historical legacy" and " innovation economy". The first group would include fields with relatively low-cost production. Many of them are quite mature and require redevelopment in order to maintain production levels and extend their life span. Most such assets are currently owned by state corporations and we suggest that state firms could continue focusing on the maintenance and redevelopment

of such legacy fields. The best example of such a corporate model is Malaysia's economic strategy which we would describe as skilful modernisation which allowed the company to build up its project management expertise. Today Malaysia is one of the leading exporters of liquefied natural gas and, according to industry experts, Petronas is the most efficient state-owned national oil company.

For fields which have difficult-to-develop reserves and high extraction costs we would suggest using what we call the "innovation economy" model. Costly and unconventional hydrocarbons require management and technical solutions which are much better developed by private companies. For that category of fields a competitive environment is required with a lighter regulatory regime, low taxes and minimal barriers to entry. Canada which is the world leader in heavy oil production is probably the best example of such a model in action. The country is at the forefront of technological innovation in unconventional hydrocarbons.

In essence, Russia's extractive industries are suffering from the same problems as the economy in general. The single most important of these is inefficiency. A weak legal system, corruption, and red tape are holding back improvements in productivity which are critical for economic growth. Economic inefficiency is also an obstacle to achieving other development objectives, such as protection of the environment.

2. Petroleum Profit Tax (PPT)

Judging by the pattern in recent years, despite a limited upward trend, Russia's ability to increase oil production is limited. In order to maintain production levels, Russia needs to upgrade major fields, which are at late stages of development, and undertake large-scale exploration in greenfield areas. Both require substantial investment. The lack of such investment is due, among other factors, to the high overall tax burden on the industry. Russia's tax regime for the oil industry is one of the toughest in the world. The total tax burden on each barrel of oil is 70-80% of revenue. In the gas industry, rates are slightly lower but they are actually being increased. In several industrialised countries, where other tax rates are generally higher than in Russia, the tax burden on the oil and gas industry does not exceed 50% of revenues. In addition, the Russian export duty formula is tightly linked to the price of oil, such that when oil prices are high, companies have little incentive to increase production which, in turn, leads to the stagnation of overall oil production. The current system hampers efficiency, not only in terms of returns on investment for oil and gas companies, but also from the point of view of government budget revenues.

For fields which have difficult-to-develop reserves and high extraction costs we would suggest using what we call the "innovation economy" model.

An important step was taken by the Russian government in recent years: the introduction of tax holidays for unconventional and Arctic offshore deposits. Such

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tax breaks create incentives for exploration and development of technically challenging fields and projects in remote areas. The difficulty is that such changes make the existing tax system even more complicated and tie it to the geological structure of specific deposits. That makes decision-making on granting tax breaks more arbitrary, increases red tape and complicates overall tax administration.

A radically different approach to tax reform is the gradual replacement of the current system – a mineral extraction tax and export duties levied on revenue – with a single petroleum profits tax (PPT). Many experts and industry representatives have argued in favour of a profit-based tax system for the oil sector. Canada, which is probably the most innovative resource economy in the world, has made a successful transition to a tax on profits for its mineral sector. The problem is that a transition to such a new system would require a fundamental change in the way taxes on oil production are administered. This would certainly not be an easy journey. Hence, we believe that **the way forward is to introduce a profit-based tax for the Russian oil sector in several phases. In the first phase the PPT would be limited to, say, 4% of total company profits.** It would be crucially important to ensure that the remainder of the tax system is adjusted in such a way that the overall effective tax burden on oil companies does not increase. This initial stage could last for two years. It would allow companies and government agencies to adopt and adjust to the new system of administering taxes. At least one more transitional stage with a higher PPT rate would be needed before a single petroleum profit tax completely replaced the current system. Other countries' experiences demonstrate that overall rationalisation of the tax system and a moderate reduction of the tax burden can achieve three main results:

- An increase in oil and gas production and in renewal of reserves;
- An increase in company profitability;
- An increase in government receipts from the sales of oil and gas.

The way forward is to introduce a profit-based tax for the Russian oil sector in several phases. In the first phase the PPT would be limited to, say, 4% of total company profits.

3. Mineral Special Economic Zones (MSEZ)

One way to overcome strong bureaucratic inertia is to introduce some of the reforms through experimental areas where new models of regulation can be tested. The logic of this approach is similar to our earlier proposal for a phased introduction of the petroleum profit tax. We believe that a new special type of special

economic zones could be introduced in Russia – a mineral special economic zone (MSEZ). It would allow exploration and production of certain minerals to be conducted under lighter regulation. An MSEZ would apply only to selected natural resources, for example, metals and ores or even only a few particular minerals. Due to the nature of the industry, it would be important to allow MSEZs to cover not just certain limited territories but entire regions and federal districts. For example, an MSEZ for mining companies could be introduced in the Russian Far East. Some possible policies that could be adopted in a MSEZ:

The probability of further price reductions for Russian gas in Europe is quite high. The main strategy for Gazprom could be to diversify its exports to buyers outside of Europe, namely in Asia and other emerging markets,

- Simplify the process of acquiring mineral exploration and production licences;
- Raise the bar for the classification of deposits with "federal status";
- Add new tax incentives for projects related to the development of technically complex fields (heavy and shale oil, shale and low-pressure gas etc.).

It is important to note that the standards for the protection of the environment for companies involved in the exploration and development of natural resources in MSEZs will always conform to universal federal requirements. No exemptions will be allowed on environmental standards.

4. Liquified natural gas

The probability of further price reductions for Russian gas in Europe is quite high. The main strategy for Gazprom could be to diversify its exports to buyers outside of Europe, namely in Asia and other emerging markets, where demand is growing fast and gas prices are higher. This requires a rapid development of alternative routes, primarily through LNG export. At present, Russia has only one LNG plant, on Sakhalin Island, the annual sales of which are 10.6 million tons of LNG. This is less than 4% of the global LNG trade and about 7% of the total exports of Gazprom. Australia, by comparison, plans to triple the production of liquefied gas by 2020, bringing it up to 80 million tons a year. The main reason for the lag in the development of Russian LNG is inefficient strategic planning and the monopoly on gas exports.

Recently, more and more people (including those in government) have started to realise that de-monopolising gas exports and allowing access to the domestic market for independent producers might actually benefit the Russian economy and the government itself. It remains to be seen whether inertia can be overcome to introduce the required changes. In order to increase Russia's share in the international market of liquefied natural gas, it is important to encourage the construction of new gas liquefaction terminals in Russia. The approval of legislative amendments in November

Russian stabilisation funds have so far provided an important balancing tool and an emergency reserve for the economy.

2013 de-monopolising LNG exports was an important practical step in that direction.

5. National Oil Dividend (NOD)

Russian stabilisation funds have so far provided an important balancing tool and an emergency reserve for the economy. The question is: where is the limit? What happens if reserves in the stabilisation funds continue to grow on the back of high oil prices? An additional problem is that reserves accumulated in the stabilisation funds suffer from a lack of transparency. They are often perceived by the public as some kind of "black box" into which parts of government revenues are being diverted. One possible solution is suggested by the example of the Alaska Permanent Fund - a special structure of the government of Alaska which accumulates part of government revenue from the oil industry (in that way it is quite similar to Russia's stabilisation funds). **We believe that a broad public discussion should be launched in Russia about the possibility of introducing a National Oil Dividend (NOD) modelled on the oil dividend paid by the State of Alaska to its citizens. The NOD would be paid annually to all citizens of Russia from the time of their birth.** The Alaska Permanent Fund dividends have been paid to residents of Alaska since 1983. In 2013, for example, each resident received US$900.

We believe that a broad public discussion should be launched in Russia about the possibility of introducing a National Oil Dividend (NOD) modelled on the oil dividend paid by the State of Alaska to its citizens. The NOD would be paid annually to all citizens of Russia from the time of their birth.

Here is a brief calculation of how much a National Oil Dividend paid to each Russian citizen could be worth. If we assume that the NOD is financed only by oil export duties, then, according to the Russian government, oil exports for the year 2012 amounted to 240 million tons; the average amount of export duty was approximately US$400 per ton. Thus the overall amount of funds received by the government in 2012 amounted to about US$96 billion. If we divide this figure by 143.5 million people, the number of Russian citizens, we get about US$669 per citizen, which is comparable to the size of the dividend paid to each resident of Alaska.

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Appendix

For the purposes of this report we are using the following definition: a country is a resource economy if over 25 % of its exports consist of natural resources and the ratio of resource exports to GDP is above or close to 10 % (we also add some countries which have this share slightly below 10 % of GDP but nonetheless have a very high share of natural resources in their exports). The former criterion is used by a number of authors and is consistent with the IMF definition of resource-dependent countries. The latter is added to ensure that countries with very low volumes of overall exports do not fall into the abundance category. Below is a full list of countries that we established as qualifying, based on IMF and United Nations (UNCTAD) data. For the purposes of our analysis we established two groups of countries: those dependent on exports of natural resources (namely mineral resources) which we refer to as "resource economies" and a narrower group of countries dependent on the exports of oil and gas specifically, which we call "oil and gas economies". Altogether there are 68 resource economies and 39 oil and gas economies on our lists. Below is a list of resource economies and oil and gas economies as well as groups of countries according to their scores in the three ratings:

- The Fraser Institute Economic Freedom of the World report;
- The World Bank's "Doing Business" report;
- The Global Competitiveness Report of the World Economic Forum.

In the groups below only those countries were included from the list of resource economies which are actually given a score in the relevant rating. In addition, we also grouped major oil and gas economies according to the structure of their oil and gas industries (private, mixed, government-owned and the "Gulf model").

Resource economies:

1. Algeria
2. Angola
3. Australia
4. Azerbaijan
5. Bahamas
6. Bahrain
7. Bhutan
8. Bolivia
9. Botswana
10. Brunei
11. Burkina Faso
12. Cameroon
13. Canada
14. Chad
15. Chile
16. Colombia
17. Congo Rep.
18. Côte d'Ivoire
19. Congo DR
20. Ecuador
21. Egypt
22. Equatorial Guinea
23. Gabon
24. Ghana
25. Guinea
26. Guyana
27. Iceland
28. Indonesia
29. Iran
30. Iraq
31. Jamaica
32. Kazakhstan
33. Kuwait
34. Kyrgyzstan
35. Laos
36. Libya
37. Mali
38. Mauritania
39. Mongolia
40. Mozambique
41. Myanmar
42. Namibia
43. Nauru
44. Niger
45. Nigeria
46. Norway
47. Oman
48. Papua New Guinea
49. Peru
50. Qatar
51. Russian Federation
52. Saudi Arabia
53. Sierra Leone
54. South Africa
55. Sudan
56. Suriname
57. Syria
58. Tanzania
59. Timor-Leste
60. Togo
61. Trinidad and Tobago
62. Turkmenistan
63. United Arab Emirates
64. Uzbekistan
65. Venezuela
66. Yemen
67. Zambia
68. Zimbabwe

Oil and gas economies:

1. Algeria
2. Angola
3. Australia
4. Azerbaijan
5. Bahamas
6. Bahrain
7. Bolivia
8. Brunei
9. Cameroon
10. Canada
11. Chad
12. Colombia
13. Congo Rep.
14. Côte d'Ivoire
15. Ecuador
16. Egypt
17. Equatorial Guinea
18. Gabon
19. Indonesia
20. Iran
21. Iraq
22. Kazakhstan
23. Kuwait
24. Libya
25. Myanmar
26. Nigeria
27. Norway
28. Oman
29. Qatar
30. Russian Federation
31. Saudi Arabia
32. Sudan
33. Syria
34. Timor-Leste
35. Trinidad and Tobago
36. Turkmenistan
37. United Arab Emirates
38. Venezuela
39. Yemen

Resource economies grouped according to their score in the Fraser Institute Economic Freedom of the World report:

Most free	2d quartile	3d quartile	Least free
Canada	Botswana	Cameroon	Mauritania
Australia	Ghana	Iran	Togo
Bahrain	Kazakhstan	Guyana	Niger
UAE	Mongolia	Azerbaijan	Mozambique
Chile	Trinidad and Tobago	Mali	Algeria
Qatar	Indonesia	Nigeria	Chad
Oman	Kyrgyzstan	Syria	Angola
Norway	Colombia	Burkina Faso	Congo DR
Kuwait	Russian Federation	Sierra Leone	Congo Rep.
Peru	Egypt	Gabon	Myanmar
Zambia	Bolivia	Ecuador	Zimbabwe
Saudi Arabia	Tanzania	Côte d'Ivoire	Venezuela
Iceland			

Resource economies grouped according to their score in the World Bank's "Doing Business" report:

Most business friendly	2d quartile	3d quartile	Least business friendly
Norway	Azerbaijan	Nigeria	Equatorial Guinea
Australia	Trinidad and Tobago	Tanzania	Laos
Iceland	Kyrgyzstan	Ecuador	Suriname
Canada	Mongolia	Sierra Leone	Iraq
Saudi Arabia	Bahamas	Sudan	Mauritania
UAE	Brunei	Syria	Timor-Leste
Chile	Kuwait	Iran	Gabon
South Africa	Namibia	Mozambique	Angola
Qatar	Jamaica	Bhutan	Zimbabwe
Bahrain	Zambia	Mali	Niger
Peru	Papua New Guinea	Algeria	Côte d'Ivoire
Colombia	Egypt	Burkina Faso	Guinea
Oman	Russian Federation	Uzbekistan	Venezuela
Kazakhstan	Guyana	Bolivia	Congo DR
Botswana	Yemen	Togo	Congo Rep.
Ghana	Indonesia	Cameroon	Chad

Resource economies grouped according to their score in the Global Competitiveness Report of the World Economic Forum:

Most competitive	2d quartile	3d quartile	Least competitive
Qatar	Indonesia	Gabon	Kyrgyzstan
Canada	Kazakhstan	Zambia	Mali
Norway	South Africa	Ghana	Côte d'Ivoire
Saudi Arabia	Peru	Bolivia	Zimbabwe
Australia	Iran	Egypt	Burkina Faso
UAE	Russian Federation	Guyana	Mauritania
Brunei	Colombia	Algeria	Timor-Leste
Iceland	Botswana	Cameroon	Mozambique
Oman	Trinidad and Tobago	Libya	Chad
Chile	Ecuador	Suriname	Yemen
Bahrain	Namibia	Nigeria	Guinea
Kuwait	Mongolia	Tanzania	Sierra Leone
Azerbaijan	Jamaica	Venezuela	

Oil and gas economies grouped according to the structure of their oil and gas industries:

Mostly private (over 80 % of production)	Mixed structure	Gov.-owned (over 80 % of production)	"Gulf model" (Gulf coop. council)
Australia	Angola	Ecuador	Bahrain
Canada	Myanmar	Iraq	Qatar
Egypt	Bolivia	Turkmenistan	Kuwait
Trinidad and Tobago	Azerbaijan	Algeria	Saudi Arabia
Equatorial Guinea	Brunei	Venezuela	Oman
Gabon	Malaysia	Iran	UAE
Kazakhstan	Norway	Syria	
	Russian Federation		
	Libya		
	Colombia		

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