1 *Introduction*

The world is richer, more democratic, and healthier than ever before. The trajectory traced by the world's Gross Domestic Product (GDP) is an upward sloping line. The frequency of free and fair elections obeys this pattern too, as do measures of human well-being, such as average lifespans. Despite the unprecedented progress that our species has achieved over the last two centuries, however, development still varies widely across space. It has skipped over some places entirely.

What explains why some countries are more developed than others? Why do Denmark, South Korea, and New Zealand have a thriving economy, a stable and democratic political system, and public policies that benefit the majority of citizens? Why are Congo, Myanmar, and Ecuador poor, unstable, authoritarian, and a hotbed of patronage politics, rent-seeking, and virulent civil strife?

These questions matter greatly. Liberal democracies that are governed by the rule of law, and that generate consistent economic growth, are blessed with smarter, healthier, and happier citizens. They tend to live beyond hardscrabble subsistence, and their children grow up to be statesmen, scientists, and respected businesswomen. They also enjoy the personal security and leisure time required to indulge in artistic expression and engage in philanthropy. Of course, they might live perfectly ordinary lives, with weekend barbeques as the pinnacle of middle-class life. Whatever the case, they probably do not live in constant fear of starvation, violence, or persecution. Their children will probably not become warlords.

While "what determines development?" is among the most important question in social science, many hypotheses that have been put forth to answer it are quite bizarre. For example, some researchers argue that the key to development is warfare and the constant preparation for war (Morris 2014). Others maintain that it is the quality of a nation's genetic stock (Wade 2014) – despite the fact that places such as China and India have experienced big reversals of fortune that were not preceded by any

obvious changes in their gene pools (see, e.g., Chanda and Putterman 2007). Perhaps the most perplexing answer that has been put forth so far to explain political and economic underdevelopment, however, is that a country's oil, coal, natural gas, and minerals are a curse.

For decades, parallel literatures in political science and economics have blamed natural resources for several pathologies. The extraction, transportation, and export of hydrocarbons and minerals are believed to vitiate the rule of law and jeopardize property rights. They therefore hinder economic diversification and retard economic growth. Instead, they stimulate unproductive rent-seeking and foment corruption. This fuels civil strife, promotes authoritarianism, and exacerbates gender inequality.[1]

Why would this be? The resource curse view postulates that natural resource exports – and especially oil – constitute an external, unearned, and "easily capturable" source of rents. This severs the fiscal link between rulers and the ruled and renders the former unaccountable to the latter. Once rulers are freed from taxing their citizens, they are freed from having to solicit their consent or input. Natural resource revenues therefore bolster the power of executives and the bureaucracy and create countless opportunities for rent-seeking and corruption. Paradoxically, although these rents may prolong the tenure of tyrants, they might also catalyze civil wars in a bid to capture this valuable prize.[2]

For these reasons, the appellation *petro-state* has become an epithet. To compare a country to Saudi Arabia or Angola is to deride it and imply that its political economy is pathological, its politics dysfunctional, and its society hopelessly corrupt. Therefore, the default reaction by researchers, policymakers, journalists, and activists to a major new discovery of oil or minerals is to shower the news with opprobrium. At best, stakeholders and concerned publics in the Global North enact nostrums to help the unfortunate victim best cope with its impending disease.[3] At worst, countries such as Equatorial Guinea and Congo are forsaken after being branded as reviled pariahs.

[1] For two recent reviews that enumerate these findings, see Frankel (2010) and Van Der Ploeg (2011).
[2] Chapter 2 reviews the literature on the resource curse and provides citations for these claims.
[3] One popular intervention is for Western NGOs to monitor and audit resource rich countries' budgets and treasuries. See Weinthal and Luong (2006, p. 41) and Chapter 8 of this book.

In disagreeing with the prevailing consensus, this book hypothesizes that the effect of oil and minerals is not negative. There is no resource curse and oil is not the devil's excrement.[4] Rather, I adduce ample evidence for a resource blessing. Not only do oil and other natural resources create immediate benefits such as an infusion of foreign capital and foreign exchange, as well as technical expertise – which can quickly spill over into the larger economy – but these also create sizable investments in infrastructure. They also generate public revenues, many upfront, which are often spent on education and health. And, as this book will demonstrate, natural resources, and especially oil, help improve the quality of political and economic institutions, strengthening the state, democracy, and the rule of law.

Readers versed in world affairs might summon some important anecdotes to protest this contrarianism. Despite Hugo Chavez's so-called Bolivarian Revolution, oil dependent Venezuela remains mired in intractable poverty exacerbated by an economic crisis and beset by political and social unrest. Oil-dependent Nigeria is afflicted by environmental degradation, corruption, and political violence. Oil- and gas-dependent Russia has slid back into dictatorship, if not imperialism. And Saudi Arabia, the world's largest oil producer and exporter, is ruled as a quasi-theocracy; one of the few places on earth where citizens have no say over their political destiny and women are treated as second-class citizens. And let's not even get started on the basket cases that are Congo and Equatorial Guinea.

Readers might also point to the authoritative, if not stentorian, exhortations voiced by pundits and policymakers. The consensus that resources are a curse has endowed anecdotes and correlations with law-like qualities usually reserved for findings in the natural sciences. The resource curse is taken as a self-evident truth at multilateral aid organizations, presented as a robust fact in popular books, and disseminated widely in the media. While magazines such as *The Economist* and *Foreign Policy* continue to publish special reports on the resource curse on a regular basis, *New York Times* columnist Thomas Friedman has decreed a "first law of petro-politics": oil and political freedom are totally incompatible.

[4] This term was coined by Juan Pablo Pérez Alfonzo, Venezuela's oil minister during the 1960s, and a founder of the Organization of Petroleum Exporting Countries (OPEC).

If taken to its logical conclusion, the view that resources are a curse entails that countries should abstain from extracting and exporting their oil, natural gas, industrial metals, and gemstones. Indeed, in the recent past some researchers and policymakers did just that: recommended that developing countries dedicated to exporting commodities and importing manufactured goods change course. In other words, that they make cars and refrigerators, not extract oil and copper, thus ending their "dependency" on the Global North.[5] Even if the price of freeing themselves from the international economic order is the forfeiting of their comparative advantage and the millions, if not billions, of dollars in foreign exchange that pay for food, medicine, and computers.

The global trade in resources

Hydrocarbons and minerals are largely responsible for modern life as we know it. Ours is a world powered by uranium, gold, silver, copper, iron, zinc, nickel, chromium, coal, natural gas, and, of course, oil. The large-scale, commercial conversion of minerals and petroleum into fuel and industrial applications helps explain why we are wealthier and healthier than our ancestors. Readily available fossil fuels and industrial metals have drastically reduced the price of transportation, fertilizers, and the chemicals and plastics that allow us to produce almost every modern good around us. They have also helped fuel globalization; a global division of labor centered on international trade and investments has reduced the price of food, medicine, clothing, technology, and services.

Calomiris and Haber (2014), citing Morris (2010), articulate it best when they write that:

> [C]oal ... could be burned to produce steam, providing reliable and seemingly endless amounts of power. The use of fossil fuels gave rise to a number of developments that changed the relationship between states and their populations. First, it gave rise to a revolution in transportation and communications, particularly the steam-powered ship, the railroad, and the electrical telegraph. These changes enabled people and goods to be moved on a massive scale, accelerating and expanding trade [...] people who had

[5] See Haber (2014) on the literature about the development strategy perspective and dependency theory.

been trapped by poverty [. . .] could now move to more productive areas of the globe and thus improve their standard of living. (pp. 76–77)

While about two billion dollars' worth of oil is traded daily, petroleum constitutes the biggest share of the energy consumed by both exporters and importers. It is for this reason that the oil price affects countries' balance of payments, savings, inflation, and growth. While large, unexpected spikes in the price can bring importers' economies crashing to the ground, sharp reductions can stimulate economic activity and tame price increases across the economy.[6] They can even make politicians more popular.[7]

The early twenty-first century's historic boom

For a book about the causes and consequences of natural resources published in 2016, it is fitting that, between 2000 and 2014, an impressive – and in many ways historically unparalleled – commodity boom occurred. Propelled by the blistering pace of economic development in China, India, and other developing countries, the consumption of oil and minerals grew exponentially during this time period. To satisfy this roaring demand, numerous extractive firms, governments, and state-run firms participated in a natural resource boom that reached nearly every corner of the world, including the Arctic.

Consider some numbers. In 2011, National oil companies (NOCs) that include Saudi Aramco, Gazprom, NIOC (Iran), PetroChina, Kuwait Petroleum, and Pemex invested over US$5 billion in research and development alone. In 2012, ExxonMobil, Shell, British Petroleum (BP), and Chevron – the international oil companies (IOCs) known as the supermajors – spent over US$100 billion on oil exploration and production (*The Economist*, August 3, 2013, online edition). Between 2013 and 2015, annual hydrocarbon investments topped US$1 trillion (International Energy Agency 2014). Precious metals and other minerals experienced a similar investment boom.

More than anywhere else, the developing world played host to this boom. While resource endowments per square kilometer in 2000 were

[6] See Engemann, Owyang, and Wall (2014) for evidence from the United States.
[7] To give one example, on the relationship between gas prices and presidential approval ratings for George W. Bush, see Beck, Jackman, and Rosenthal (2006).

worth US$114,000 in the Organization for Economic Cooperation and Development (OECD) countries, they were worth only US$23,000 in Africa (Collier 2010). Since then, however, mining and hydrocarbon firms and oil importers have looked to emerging markets, including previously neglected countries in Africa and the Pacific. China has been at the forefront of many of these new ventures, investing quite heavily in upstream and downstream extractive projects across the developing world. While Chinese outward investment in energy and minerals surpassed US$77 billion in 2011, Russia and India tallied impressive numbers around that time as well (see Rostoum 2014).

Many developing countries therefore became new explorers, producers, and exporters of natural resources. In Afghanistan, Liberia, and Kenya, geologists discovered trillions of dollars in untapped stocks of copper, gold, cobalt, lithium, and other rare earths. Kenya won the double jackpot. It, along with Tanzania, Uganda, and Ethiopia, became home to quite promising hydrocarbon discoveries. So did Vietnam, Mozambique, and Papua New Guinea. Unsurprisingly, between 2000 and 2012, average rents from natural resources grew by over 30 percent in the average Sub-Saharan African country. And they grew by over 10 percent in the average Asian country.[8]

Older natural resource producers in the developing world also experienced revivals. They include Angola, Azerbaijan, Botswana, Ghana, Indonesia, Kurdistan, Niger, Russia, and South Africa. They also include major Middle Eastern producers. Between 2007 and 2013, over US$340 billion was invested in the region's hydrocarbon sector, the lion's share of its GDP. Latin America's pedigreed oil and mineral producers were not far behind either. From 2004 to 2007, Foreign Direct Investment (FDI) dedicated to hydrocarbons grew by 223 percent in Brazil and 623 percent in Colombia; and FDI allocated to mining grew by 458 percent in Brazil, 502 percent in Bolivia, and 550 percent in Mexico (see Bebbington and Bury 2013, p. 16).

Besides being one of the most capital-intensive sectors of the world economy, hydrocarbons, mining, and timber produced reliable sources of income for developing countries during the boom. For the 165 nations that obtain any amount of rents from natural resources, in 2012 the average value of those rents totaled 11 percent of GDP; the

[8] I calculated these figures using the World Bank Development Indicators; Asia includes East Asia, Southeast Asia, and South Asia.

median 5 percent.[9] This represents hundreds of billions of dollars of foreign exchange and huge amounts of public revenues that governments in the developing world heavily rely on.

But why emphasize the developing world? After all, it is also the case that between 2000 and 2015 a huge boom in unconventional hydrocarbons, often extracted after the hydraulic fracturing of shale rock, or retrieved from oil sands, also occurred in North America. It is no wonder, therefore, that the United States and Canada are among the world's top destinations for oil and gas investment. Yet, further ahead I will demonstrate that this achievement is misleading. Other mature producers, such as Russia and China, also top the charts. What both sets of hydrocarbon producers share in common is that they have long depleted their easiest-to-extract reserves and have resorted to sophisticated, and expensive, techniques, including hydraulic fracturing or secondary recovery. Conversely, some mature producers in the developing world such as Saudi Arabia still have massive oil fields that they have not yet drilled, and/or the lion's share of their stocks can be extracted at quite low marginal cost, which drives down their capital investment costs. In Chapter 5, I demonstrate that after holding other things constant, such as a country's surface area and the age of its extant oil wells, total capital allocated to hydrocarbons – both foreign and domestic – is greater in developing countries than in the developed ones.[10]

Moreover, this book does not totally neglect the developed world. To the contrary, it draws several lessons about the causes and consequences of natural resources from the historical trajectory of developed countries. This is for several reasons. Long before tales of resource curses sprang up in countries across the developing world, it is in the developed world where many of the world's most notable mining and oil booms began. Countries such as Sweden, England, Canada, the United States, and Australia make clear that, while natural resources are not exogenous, randomly assigned variables, their effects

[9] I calculated these figures using the World Bank's World Development Indicators.
[10] Conventional FDI data on hydrocarbons are not adjusted for purchasing power parity, thus lowballing countries with cheap land and labor; neither does it include domestic sources of capital, such as the profits of nationalized oil companies that are reinvested, or the value of shares owned by domestic investors.

are, on the whole, salutary for political and economic development. This is true for both the current boom and past boom periods.

The 2014–16 oil bust and worries about climate change

Why focus on natural resources, and especially oil, if it's yesterday's news? As of late, commodity exporting countries and the mining and hydrocarbon firms that do business there have faced several serious challenges, some of them potentially existential. These days it is not uncommon to hear that fossil fuels are doomed to – forgive the bad joke – go the way of the dinosaurs: extinct.

A historic collapse in the international oil price began in June of 2014. By November of 2015, crude petroleum had lost more than half its value. Similar collapses in other fossil fuels and the prices of key industrial metals, especially copper, occurred simultaneously. There are several reasons for this unprecedented bust.

On the supply side, commodity stockpiles mushroomed in anticipation of high future demand. In regards to hydrocarbons, these gluts were exacerbated by historically high levels of oil and gas production in the United States. Further downward pressure on the price of oil ensued. Saudi Arabia, the world's swing producer, and thus the ultimate stabilizer of prices, decided to abstain from cutting back on the production of crude. Other oil producers, such as Russia, continued to pump oil at record levels to compete for market share.

On the demand side, in regards to the price of tradable commodities in general, demand for oil and other raw commodities in the developed world peaked around 2005. Over the last decade Americans, in particular, have tended to drive fewer miles than they once did. Moreover, an economic downturn gripped China beginning in early 2015 and led to a notable decline in Chinese demand for fossil fuels and industrial metals; since China accounts for about half of the world's consumption of raw commodities, this helps explain a significant share of the 2014–16 reduction in commodity prices.

Finally, there are signs that both developed and developing countries are beginning to craft plans to limit greenhouse gas emissions in a serious way. This has led many market analysts to fret about the fact that many hydrocarbon firms, whether they are privately held multinationals or state-owned and – run, will be faced with the prospect of writing down billions of dollars in "stranded assets." This

would entail that the quantity of capital allocated to fossil fuels will be sharply reduced in the future in order to adjust to reductions in demand associated with new taxes, bans, carbon trading markets, or changes in the price of substitutes. Before the 2014–15 oil price collapse, oil consumption was projected to increase from 90 million barrels per day (bbl/d) in 2013 to 104 million bbl/d in 2030 and 113 million bbl/d by 2040 (see *The Economist*, August 3, 2013, online edition). Now it is unclear if these projections will hold.

In the more immediate term, the situation appears mixed. On the one hand, many multinational oil and mining companies' profits have taken a huge hit; firms that became highly leveraged in the wake of record low interest rates after the 2008 Global Financial Crises have been especially affected. In turn, firms have reduced their exposure to the exploration and extraction of natural resources in the most risky projects – for oil, this means they have curtailed their investments in the Artic, the North Sea, and the Atlantic Ocean.[11] On the other hand, only a handful of American fracking firms have gone bankrupt in the wake of the 2014–16 oil price collapse. While the number of drilling rigs in operation has plummeted, and thousands of oilfield workers have lost their jobs, most of these small, nibble fracking firms have found ways to continue to break even at rock bottom oil prices. They have cut costs to the bone, ramped up the production of oil from existing wells to continue to compete for market share, and some, amazingly, have even raised new rounds of capital.[12]

Ironically, the most recent commodity bust has perhaps set the stage for another boom down the road. Reductions in exploration and extraction will inevitably map onto a reduced supply of natural resources in the future, thus fueling higher prices, which should incentivize yet another

[11] Global investment in upstream oil and gas was reduced by over 100 billion dollars in 2015 compared to 2014 (see *The Economist*, November 14, 2015, online edition).

[12] Innovations include substantially increasing the amount of sand pumped into oil and gas wells, improving the propping of the shale rock after fracturing it to remove more hydrocarbons, protracting the length of horizontal oil drills, swiftly reallocating rigs to locations to the oil and gas can be extracted more efficiently, and dramatically reducing the time it takes to drill a well (see Olson and Ailworth 2015, p. A2). Whether many of the smaller, highly leveraged fracking firms will survive seems especially doubtful in light of the fact that the junk bond market that underwrites their financing has taken a huge hit since late 2015, driving up yields and drying up credit. Indeed, between January 2015 and June 2016, over seventy-five energy firms declared bankruptcy

big round of investment, exploration, and production down the line. Even if concerns about climate change continue to intensify and translate into tighter regulations on carbon emissions, and a shift away from oil, this may mean that natural gas, which produces far less carbon dioxide than oil, will increasingly pick up the energy supply slack. The next big energy boom may be centered on gas and feature much more fracking.

Similarly, even if we will soon be able to extract all of the minerals we will ever need from nearby asteroids, countries cannot simply wave a magic wand and conjure a modern industrial economy – a point that will be made clearer further ahead. Therefore, it is not a surprise that developing nations have ignored pleas by academics and think tanks to leave the big bills associated with natural resources on the sidewalk. While the halls of the World Bank and Non-governmental organizations (NGOs) may be festooned with posters that read "just say no to blood diamonds," this is certainly not the case in Kinshasa's presidential palace.

The bottom line is that identifying the underlying causes and consequences of hydrocarbons and other natural resource production remains imperative. If hydrocarbons and minerals in fact cause political, economic, and social underdevelopment, then the global commodity trade is harming billions, and it will continue to do so into the foreseeable future. If there is a resource curse, it is among the most perverse and large-scale tragedies in history. Minerals, oil, natural gas, and coal, which bankroll prosperity for so many by making modern life possible, might be condemning many more to doom and despair.

This book's contributions

This book makes several contributions. First, in its attempt to contribute to the literature on the causes and consequences of natural resources, it reaches a host of new conclusions that strongly challenge received wisdom. Second, it contributes to the literature on comparative political economy in general, situating natural resource sectors in a greater institutional and policy infrastructure, at both the global and national level. Third, it offers insights into political and economic history.

This book attempts to make sense of the cross-national correlation between natural resources and underdevelopment in a new way. While I acknowledge many of the anecdotes that paint the extractive industry