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We Don't Need No Education: Resource Endowments and the Demand for Social Service Provision

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Abstract

Conventional wisdom holds that citizens demand high quality service provision across all countries and sectors, and as a result, attributes variations in education, health and other human development outcomes to supply-side factors. However, this paper challenges this assumption. We argue that such outcomes are the result of both supply- and demand-side factors, and thus should not be viewed as reflecting variation in service delivery. Moreover, citizen demand for services varies across both countries and sectors, and it does so systematically. We demonstrate the importance of demand-side factors through an analysis of the impact of natural resource rents on health and education outcomes. While citizens in rentier and non-rentier states both demand high quality health services, those who benefit from oil and gas rents are less likely to need and demand high quality education. This is because citizens in rentier economies can obtain a high standard of living regardless of the quality of education they attain, but oil rents have no systematic impact on their demand for good health. We support this argument through cross-sectional analysis of national-level health and education outcomes in nine countries in the Middle East and North Africa. Doing so highlights the importance of taking citizens' demand for services seriously, draws attention to problems of using health and education outcomes as measures of service delivery, and extends the literature on rentier states.

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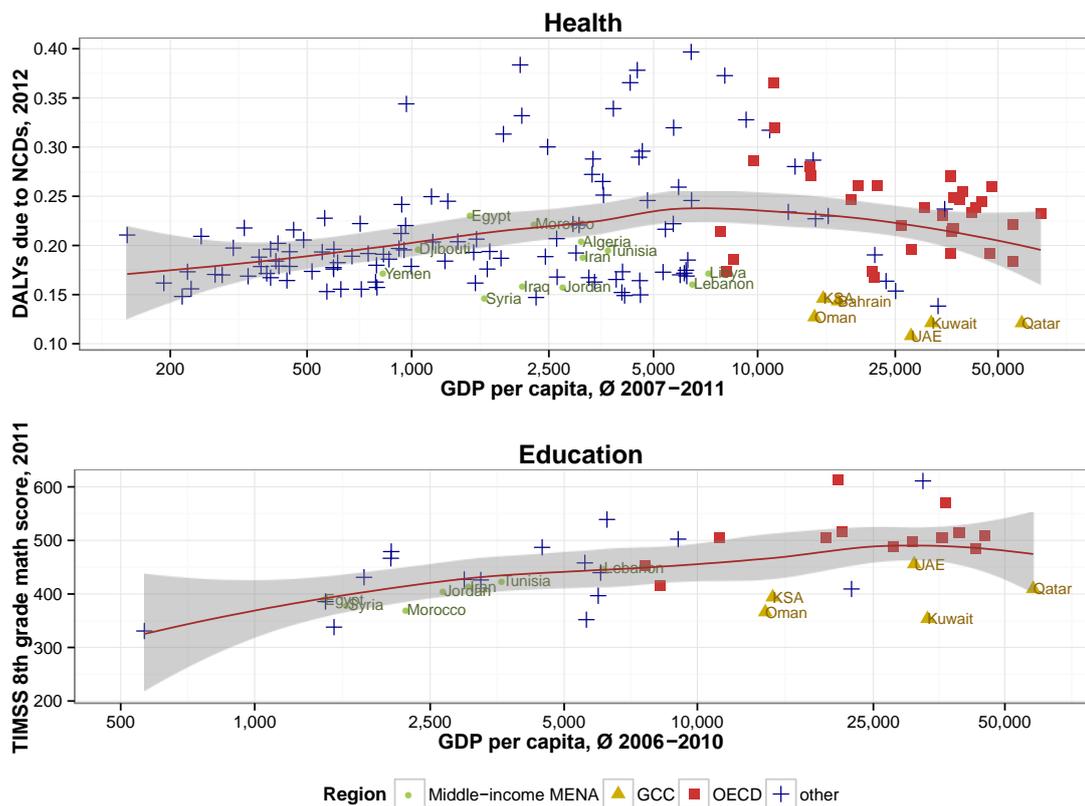
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1. Introduction

Why do students in Finland and South Korea outperform those in larger, well-endowed countries on international tests of math and science?¹ And why are the United Arab Emirates (Chaudhary 2015) and other Gulf countries considered a regional hub in quality health care research and delivery, while they underperform in education? Figure 1 shows that the Gulf countries Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the United Arab Emirates outperform similarly wealthy OECD countries in one measure of healthcare performance. Yet, the same countries trail behind in education service delivery: compared to similarly wealthy countries, average student test scores are significantly lower in the Gulf countries.² What explains this variation?

Figure 1: Health and Education Service Delivery Outcomes across the World



Analysts generally focus on *supply*-side factors when answering these questions. They argue that better health, higher test scores, and other indicators of human welfare require not only material and human resources, but also institutions that create incentives for

¹ According to the 2011 Trends in International Mathematics and Science Survey (TIMSS 2011), eighth graders obtained a math (science) score of 514 (552) in Finland and 613 (560) in South Korea. These scores are well above the world averages of 453 (467).

² See below on the definition of the health and education performance indicators employed.

providers and policymakers to provide services and strengthen monitoring of performance. For instance, they point to pay for performance (P4P) schemes (e.g., Lavy 2002; Hanushek and Raymond 2005; Muralidharan and Sundararaman 2011; Contreras and Rau 2012; Duflo et al. 2012; Gertler and Vermeersch 2013; Chimhutu et al. 2014; Huillery and Seban 2014; Peabody et al. 2014), increased community information and participation (King and Özler 2005; Barber and Gertler 2009; Björkman and Svensson 2009; Pradhan et al. 2011; Olken et al. 2014), or client choice (Angrist et al. 2002; Hanushek and Raymond 2005; Muralidharan and Sundararaman 2013) as mechanisms that can improve accountability and increase provider effort. Independent media (Mulligan et al. 2004; Keefer and Khemani 2005; Larcinese 2006; Charron and Lapuente 2010) and strong administrative institutions (e.g. ombudsmen or redress committees; see AlMadhoun 2012; Prettitore 2012; Brixi et al. 2015) can help educate consumers of their rights, facilitate citizens' ability to make demands and counter corruption, which can strengthen service provision (Gupta et al. 2000; Davis 2004; Acemoglu and Robinson 2013; Kayode et al. 2013). In this view, accountability mechanisms, by allowing citizens to demand quality services through both the long- and short-route of accountability (World Bank 2004), best explain the variation in service delivery and, ultimately, human development outcomes.³

Supply-side factors are important, but the emphasis on supply-side accountability mechanisms overlooks the *demand*-side factors that also affect outcomes. In this paper, we focus on how national-level factors impact citizens' preferences over services and, consequently, human development outcomes, demonstrating this through an analysis of how oil and gas rents impact the quality of and demand for education and health services. We focus on the Gulf, where the expansion of rents preceded the development of a productive economy and thus have a powerful influence on preferences. We argue that citizens in countries with significant rents—whether from natural resources or other sources—hold different demands for services than those in other countries because they often can obtain a high standard of living regardless of their educational skills. They demand high quality health care, just like citizens elsewhere, but they are less concerned with attaining high quality education.

³ Like others who examine the political economy of service provision, we view human development outcomes to be driven by, and thus reflecting, service provision. The assumption is that well-functioning service facilities (whether state or private) result in better outcomes. Thus, it is not unusual to see student scores as measures of education provision or mortality rates used to reflect healthcare. We accept the underlying logic and follow this convention.

We demonstrate the role of demand-side factors in two steps. We begin with a cross-regional analysis of health and education outcomes, taking into account both supply- and demand-side factors to explain outcomes in health and education. We then turn to an analysis of student and parent attitudes toward education across nine countries in the Middle East and North Africa (MENA). This allows us to hold general “cultural” factors constant and to look in more detail at the preferences over education. We find that oil and gas rents have no direct impact on the delivery of health outcomes, but they significantly impact educational attainment.

Recognizing the extraordinary divergence in demand for health and education in the rentier states is significant for several reasons. First, it prompts us to rethink the importance of citizens’ demands for service delivery. Second, the findings ask us to consider not only why demand and supply of service delivery differs across countries, but also across *sectors*. It thus counters a tendency to view service delivery as a uniform process, overlooking important differences in both the nature of demand and processes of supply.⁴ Finally, it helps extend our understanding of the impact of rents on governance and service delivery. The vast majority of literature on the impact of oil has focused on how it influences democracy, economic growth and, to a lesser extent, human development. Very little work has focused on the impact of oil on health and education. Yet, understanding these dynamics not only helps to elucidate the challenges facing millions of people living in rentier countries, but it also sheds light on important theoretical and policy-relevant questions regarding the intersection of institutions, resources, and demand for services. Determining the barriers to achieving excellent education outcomes is particularly important given the preponderance of evidence that links the quality of educational achievement to human welfare and economic development (cf. Hanushek 2013).

The paper proceeds as follows. The second section examines the political economy of service provision, arguing that performance needs to be understood as the outcome of both supply- and demand-side factors. The third section uses a cross-regional analysis to examine the impact of rents on health and education. The fourth demonstrates the

⁴ Batley and McLoughlin (2015) present a useful framework for distinguishing between service sectors based on organizational characteristics. We embrace this framework but go beyond it, demonstrating that country-level circumstances may alter demand for one service but leave another unchanged.

difference in demand for education in rentier and non-rentier states in MENA. The final section concludes and discusses implications for future research and policymaking.

2. The Political Economy of Social Service Provision and Human Development Outcomes

Our review focuses on the literature that examines country-level variation. We begin by considering lessons from the literature that help explain variation in the supply of service provision, which has received the bulk of attention. We then provide a demand-side story, drawing on observations from the Gulf to demonstrate the assumptions underlying our theory. Finally, we combine supply- and demand-factors and set forth testable implications.

Supply-side arguments. The literature suggests that the nature and quality of institutions should impact the quality of service delivery and human development outcomes at the country level. Democracies appear to facilitate better service provision (Bueno de Mesquita et al. 2003; Stasavage 2005), since the less advantaged are able to demand better services and their officials have incentives to deliver in an attempt to win re-election. Of course, as Keefer and Khemani (2005) remind us, elected politicians often provide highly visible public goods—building schools and hospitals, for instance—but do not improve the quality of teaching within their classrooms. Moreover, clientelistic practices can flourish within democracies, leading to the protection of politically connected, unproductive providers (Fujiwara 2015), or the provision of selective or club goods over public welfare (Stokes 2005; Kitschelt and Wilkinson 2007; de la O 2013; Stokes et al. 2013). It is not simply regime type but the quality of institutions that affects outcomes.

The level and nature of resources available in the country should also influence service provision. First, countries with greater socio-economic resources may more easily provide necessary material and human resources (Pritchett and Summers 1996; McGuire 2010). Second, socio-economic development is associated with democratization (e.g., Lerner 1958; Almond and Verba 1963; Deutsch 1964; Przeworski et al. 2000; Boix and Stokes 2003; Epstein et al. 2006; Boix 2011)—which, in turn, fosters social service provision, as discussed above. The exact nature of this relationship, and its robustness over time, has been vigorously debated (cf. Przeworski et al. 2000; Boix and Stokes 2003;

Boix 2011; Bermeo and Yashar 2014), but—*ceteris paribus*—greater socio-economic resources may work both directly and indirectly to foster better outcomes.

However, wealth derived from natural resources can have a negative effect on some service delivery outcomes. The impact of resources on service provision is largely unexplored, but there is a great deal of awareness that resources may affect economic growth and welfare. Oil has been found to depress economic growth (Rodríguez and Sachs 1999; Sachs and Warner 2001; Neumayer 2004; Goldberg et al. 2008) and undermine human development (Bulte et al. 2005). This relationship may hold primarily because oil promotes poor quality institutions (Beblawi 1987; Chaudhry 1997; Papyrakis and Gerlagh 2004; Bulte et al. 2005) or autocratic stability (e.g., Ross 2001, 2008; Smith 2004; Ulfelder 2007; Aslaksen 2010; Tsui 2010; Ramsay 2011), or because rents incentivize rent-seeking policies (Jensen and Wantchekon 2004). Critics point out that oil does not always have a negative impact (Herb 2005; Alexeev and Conrad 2009; Haber and Menaldo 2011), and argue that the obstacles to democratization are found in the level of inequality (Dunning 2008), state ownership over resources (Jones Luong and Weinthal 2010), the pre-existing quality of state institutions (van den Bosch 2012; Waldner and Smith 2014), or the sequencing of state development and the expansion of oil rents in the economy (Karl 1997). Yet, although the relationship between resources and institutions is nuanced, there is reason to believe that natural resources often impact institutions, which affect public goods provision and outcomes negatively.

Importantly, the supply-side account does not give any reason to anticipate sector-level variations in outcomes. Indeed, the impacts of programs aimed at improving health, education and other outcomes are often analyzed independently, and even when heterogeneous impacts have been observed (e.g., Dammert 2008; Fernald et al. 2009), they are not fully explained. This reflects the fact that the supply-side argument lacks a theoretical explanation for sectoral variation in outcomes.

Taken together, *supply-side* arguments lend a number of expectations: (1) institutional strength should have an important impact on performance; (2) there should be no significant difference between performance in health and education; and (3) oil should not have an independent effect on health and education provision; the impact of oil and

gas rents on health and education outcomes is through the impact of resources on institutions alone. These hypotheses are summarized in Table 1.

Table 1: Supply-side expectations regarding health and education service provision

	<i>Non-rentier state</i>	<i>Rentier state</i>
<i>Weak institutions</i>	low performance	low performance
<i>Strong institutions</i>	high performance	high performance

Demand-Side Arguments. The extant literature largely ignores demand-side factors. Scholars occasionally recognize that citizens do not mobilize equally to demand services, but they generally assume that this is because the lower educated and poor do not have the necessary information, resources, or sense of efficacy to make their demand heard (Ghobarah et al. 2004; Keefer and Khemani 2005; Nelson 2007; Acemoglu and Robinson 2013). Such arguments may explain inequalities within a country, but they cannot explain cross-national variation.

The literature on welfare state policy examines demand, but it focuses on citizens' preferences on *welfare state policy*, while assuming that individuals' own demand for *high quality services* remains constant across countries and sectors. Individuals' socioeconomic background—such as education, income, skill specificity, or unemployment (Iversen and Soskice 2001; Corneo and Grüner 2002; Alesina and La Ferrara 2005; Rehm 2005; Kaltenthaler and Ceccoli 2008; Amable 2009)—their ideological position (Fong 2001; Blekesaune and Quadagno 2003), religious attendance (Scheve and Stasavage 2006), relative living standard (Corneo and Grüner 2002), exposure to labor market risks (Cusack et al. 2006), or the structure of the labor market (Fernández-Albertosa and Manzano 2014) may affect support for welfare policies. Yet, in this view, citizens all want to achieve high quality health and education. They simply disagree on the *means* to achieve these outcomes—be it the overall size of the welfare state or government intervention in the form of *public* support for the sick, the old, and the unemployed (Iversen and Soskice 2001; Blekesaune and Quadagno 2003; Scheve and Stasavage 2006; Kaltenthaler and Ceccoli 2008; Fernández-Albertosa and Manzano 2014), or increased income redistribution (Fong 2001; Corneo and Grüner 2002; Alesina and La Ferrara 2005; Rehm 2005; Cusack et al. 2006; Amable 2009). Moreover, in the cases examined in

this literature, *public* services are usually paid by taxpayer money.⁵ Research on the demand for welfare services examines the determinants of demand for state-led and taxpayer-financed services, but not how demand may vary for different sectoral outcomes, such as health and education.

We argue that national contexts can shape citizens' demands for high quality services. Before turning to the argument, note that individual demands for services should be understood not simply as preferences over outcomes, but in terms of individuals' willingness to invest in attaining them. We do not dispute that everyone wants to be smarter and healthier; New Years' resolutions are testimonies to such desires. But, not everyone is willing to invest time and energy to achieve these goals.

There are at least three ways in which even the supply-side story of public goods provision implies consumer investment. Through the short-route of accountability, clients are expected to monitor providers, to voice demands and provide incentives. The same holds true through the long route of accountability, where citizens monitor and incentivize policymakers to provide goods. And finally, less recognized in standard accounts of service provision, consumer engagement and compliance is necessary for achieving good outcomes. When patients do not correctly follow health regimes (Jin et al. 2008); when parents fail to take an interest in their children's schooling, and when students skip school or leave textbooks uncracked (Sénéchal 2006; OECD 2007), there is little that even the best doctor or teacher can do to achieve good results.

Fully informed, wealthy individuals may not demand high quality services, and they do not demand all services equally. In countries such as Finland and South Korea, citizens appear to hold a "shared social belief in the importance of education and its 'underlying moral purpose'" (Huffington Post 2012). Both excel despite different learning structures. Elsewhere, such expectations are absent. Indeed, the 2011-12 School and Schooling report of Qatar found that students missed an average of 17% of school days across all school types, and got late to school in about 15% of all days (Qatar Supreme Education

⁵ All of the cited studies use survey data. The formulation of the questions that serve as dependent variables in these studies often make the connection between redistribution, tax moneys, and the welfare state clear. For instance, the main dependent variable in Fernández-Albertosa and Manzano (2016) is the respondent's answer to "If the government had to choose between *increasing taxes* and spending more on social benefits and services, or *decreasing taxes* and spending less on social benefits and services, which should they do?" (p. 7; italics added).

Council 2012; see also Walker 2014). Similar evidence is found in Kuwait (Faour 2012). Both countries are wealthy; so it is unlikely that absenteeism is caused by students' need to work in order to support their families' livelihoods. Rather, high absenteeism in Kuwait and Qatar are one indicator of students' low enthusiasm to learn, and their parents' low level of concern for poor performance.

Different political economies shape differences in educational attainment in rentier and non-rentier countries. Compare rentier and non-rentier states in the MENA. Free education, free health care⁶, subsidies, stipends, and generous public employment packages were central features of the social contract established between governments and their citizens across the MENA region in the post-independence period (World Bank 1998). However, in non-Gulf MENA countries, when demand for services and public sector jobs exceeded the state's capacity to supply them, states were forced to cut and implement austerity programs, pushing many to seek immigration abroad and private sector employment at home. High educational achievement is a key to such positions, and it has a high rate of return. Studies have found, for instance, that in Jordan and Egypt the returns to education are large in the increasingly important private sector, at home and abroad (World Bank 2013). Education remains key to citizens' abilities to obtain high positions abroad and to enjoy higher standards of living.

Meanwhile, Gulf citizens continue to benefit from generous welfare regimes. Housing is subsidized; healthcare and education are free and widely available, and social safety nets robust. Most constitutions guarantee lifetime employment in the civil service right after graduation⁷, and the public sector in the Gulf remains the major employer of nationals⁸,

⁶ For example, Article 16 of the Kuwaiti constitution states: "The State cares for public health and for means of prevention and treatment of diseases and epidemics," whereas article 15 states: "Education is a fundamental requisite for the progress of society, assured and promoted by the State" (International Constitutional Law 2010).

⁷ For example, article 13 of the constitution in Bahrain explicitly guarantees "the provision of job opportunities for its citizens and the fairness of work conditions" (Kingdom of Bahrain 2002). Similarly, the constitution of Kuwait stipulates that nationals are provided with lifetime guaranteed employment in the civil service, and with subsidized housing for married employees. Article 41 states "Every Kuwaiti has the right to work and to choose the type of his work. Work is a duty of every citizen necessitated by personal dignity and public good. The State shall endeavour to make it available to citizens and to make its terms equitable" (International Constitutional Law 2010).

⁸ This preference is reflected in high percentages of higher education graduates in fields of specializations most demanded by the public sector (i.e. humanities and arts), knowing that they will have the option of public sector employment (Gallup 2013). While Gulf States have imposed nationalization policies on the private sector to encourage employment of nationals, most of these policies have been criticized for failing to induce nationals' productivity and for imposing higher costs of labor on the private sector unnecessarily (U.S. Department of State 2014).

with salaries that pay above productivity and human capital endowment levels.⁹ These positions offer generous employment packages and worker protection, whereas the private sector remains dominated by the abundant supply of low wage foreign labor. Voluntary unemployment has been reported (AlQudsi 2005) if citizens feel the jobs do not meet their high expectations, and given generous social support, they are able to remain out of the labor force and afford a suitable life style. There are few incentives to gain skills, as labor force policies within the civil service administration, such as compensation, evaluation, retention, and promotion are generally dependent on seniority and other subjective considerations and disconnect output from rewards, (Ruppert Bulmer 2000), and unemployment benefits create reemployment disincentives and wage pressures. As Michael Herb (2014: 11-13) puts it, “As long as public-sector jobs are freely provided to citizens, the safest (and certainly the least arduous) strategy for most citizens is to educate themselves only to the standard required for these state jobs, and that is often a low standard.”

Note that our argument is based on the impact of resource endowments on citizens’ perceptions of the value of education and the need to work. Not just the level of resources, but also the sequencing of economic development and the establishment of rentier economies, may shape this belief (Karl 1997). For instance, in Norway, although a large fraction of oil income is still channeled back to the people through social spending and social security, economic development preceded the discovery of oil, public employment policies continue to rely on competitive practices, a vibrant private sector flourishes, and the private rate of return to education remains one of the highest in the world.¹⁰ In Oman, relatively small oil reserves help explain why Omanis are engaged in the labor force, comprising 51% of the labor force in 2003 and had a male labor force participation rate of nearly 65% (Gonzalez et al. 2008: 161-163). In both cases, there are ample incentives for citizens to demand quality education.

It is also useful to note that there is no significant evidence that autocratic regimes, and particularly those in rentier states, are purposefully suppressing individuals’ demands for education. The Gulf States imported a Western model of higher education to meet

⁹ For example, a World Bank (2013) study suggests that in the United Arab Emirates, wage differentials persist after controlling for education and skills and indicates that nationals earn wages that are two or three times higher than those of migrants.

¹⁰ For example, the private net present value (net economic benefits) for an individual obtaining upper secondary education in 2007 was 111,251 while the OECD average was 77,604 (OECD 2007).

national reform agendas, invest in local talents and human capital, and attempt to address some of the inefficiencies present in the labor market.¹¹ Other examples include China, where secondary school completion rates reached 100.4 percent in 2013¹² and Singapore, where government expenditure on education reached 2.9 percent of GDP in 2013 (World Bank 2014b). As previously mentioned, it is not regime type per se that can undermine development, but rather the quality of institutions and underlying power dynamics.¹³

In contrast to education, we expect that a country's resource endowment does not affect citizens' demand for good health. Regardless of the amount of unearned foreign income available in their country, citizens like to be healthy. Of course, this does not mean that they are always fully aware of health issues or willing to invest time and energy into remaining healthy. Indeed, as in other developing countries, where globalization, rapid urbanization, and increasingly sedentary lifestyles combine with a lack of health education fosters poor outcomes (Wagner and Brath 2012), the MENA has experienced increases in obesity and chronic diseases (e.g., hypertension, diabetes). Yet such changes are not systematically related to resource endowments.

This *demand-side* argument yields a number of expectations: (1) country-level performance may vary in predictable ways across service sectors; (2) citizens in resource-endowed countries should demonstrate lower demand for education, while those in non-resource endowed countries should demonstrate high demand; (3) there should be no significant difference in demand for performance in health sectors of resource endowed and non-endowed countries. This *demand-side* argument is depicted in Table 2.

¹¹ This Western model has taken diverse forms, ranging from American-style institutions (e.g. American University of Kuwait), to branch campus (e.g. Carnegie Mellon University in Qatar), or to a full-fledged replica liberal arts campus (e.g. New York University, Abu Dhabi).

¹² Enrollment rates may increase 100% due to repeated grades.

¹³ For more on this subject, see Huntington (1968); Dreze and Sen (1989); Wade (1990); Maravall (1994); Diamond and Plattner (1995); Ross (2006); Hasnain (2008); Herb (2009); Fukuyama (2012); Gerring, Thacker and Alfaro (2012); and McGuire (2013).

Table 2: Demand-side expectations regarding health and education service provision

	<i>Non-rentier state</i>	<i>Rentier state</i>
<i>Health</i>	high demand	high demand
<i>Education</i>	high demand	low demand

In short, both natural resource rents and institutional quality shape service delivery and development outcomes. Table 3 combines the supply- and demand-side stories. We hypothesize that in non-rentier economies, institutional quality is the main determinant of high quality social service provision across sectors; stronger institutions improve the quality of health and education service provision. In rentier economies, by contrast, citizens’ demand for high quality service provision is an additional, significant determinant. Low demand coupled with weak institutions leads to very low-quality service provision, while high demand and high institutional quality are conducive to high-quality service provision. Hence, we argue:

H1: Rents do not have an effect on the quality of health outcomes.

H2: Rents depress the quality of education outcomes.

H3: Higher institutional quality improves the quality of both health and education outcomes.¹⁴

Table 3: Social service provision in rentier and non-rentier economies

	Non-rentier state		Rentier state	
	<i>Health</i>	<i>Education</i>	<i>Health</i>	<i>Education</i>
<i>Low institutional quality</i>	<i>high demand</i> → intermediate performance	<i>high demand</i> → intermediate performance	<i>high demand</i> → intermediate performance	<i>low demand</i> → low performance
<i>High institutional quality</i>	<i>high demand</i> → high performance	<i>high demand</i> → high performance	<i>high demand</i> → high performance	<i>low demand</i> → intermediate performance

¹⁴ Our argument implicitly assumes that the education and health sectors have a similar elasticity toward reform. That is, the empirical evidence presented below rests on the assumption that “institutional stickiness” is the same in both sectors and an increase in rent income makes, in theory, reforms of education and health service provision equally feasible.

3. Statistical Analysis

3a. Data and Measurement

We employ two strategies to test the hypotheses outlined above. First, we use cross-sectional regression analysis to estimate the effect of rents and institutions on health and education outcomes across countries. Second, we turn to education survey data from students in rentier and non-rentier countries in MENA to test some of the observable implications of our argument.

Our main dependent variables are indicators of health and education outcomes. Extant studies often use government social spending (e.g., Mulligan et al. 2004), enrollment rates or average years of schooling (e.g., Lake and Baum 2001), and infant mortality rates (Ross 2006; McGuire 2013) to measure social service delivery. However, we find such indicators problematic. Social spending indicators do not tell us whether the money is spent on a highly visible public good, or on actually improving the quality of health or education service delivery (Keefer and Khemani 2005). Other measures may simply reflect a country's legal framework. For example, a long school attainment can result in good education—but it can also be the product of long compulsory school attendance. Thus, while clearly an indicator of education, long school enrollment does not reflect high education quality.

To measure *health outcomes*, we use the age-standardized *mortality rate* (per 100,000 people) and the number of *Disability-Adjusted Life Years (DALYs)*, both taken from the WHO (2014b and 2014a, respectively). The DALY indicator sums up all years of life lost due to diseases and premature death (YLL) and due to disability and less-than-optimal health conditions (YLD) (De Hollander et al. 1999; WHO 2013).¹⁵ A DALY can be conceptualized as one year of healthy life lost. We use per capita values.¹⁶ For both measures, we focus only on non-communicable diseases (NCDs) as the most prevalent form of disease—according to the 2012 Global Burden of Disease (GBD) report, non-

¹⁵ To calculate the total number of DALYs per country, YLL and YLD are estimated for each condition and then summed up. For instance, to estimate the number of DALYs incurred through road traffic accidents in a specific country and year, add the number of years that survivors of such accidents live with disabilities caused by the accident and the total years of life (expectancy) lost due to fatal road accidents (Murray and López 1996).

¹⁶ The WHO data reflect the total number of DALYs. As this number is largely driven by a country's population size, we create per capita values (data on population size from the WHO).

communicable diseases were responsible for 68 percent of all deaths globally in 2012, up from 60 percent in 2000. The four main NCDs are cardiovascular diseases, cancer, diabetes, and chronic lung diseases (Alwan 2011). Increasing values on both the DALY measure and the mortality rates reflect a higher burden of disease and, consequently, worse health outcomes. Both indicators are available for 2012.¹⁷

Our main set of indicators for education outcomes is taken from the most recent wave of the *Trends in Mathematics and Science Study* (TIMSS 2011).¹⁸ The TIMSS uses standardized tests to assess student achievement in math and science in the fourth and eighth grades.¹⁹ Below, we use *averages of the math and science test scores* by grade from 2011. Higher values reflect a better education performance. Note that we decided against using the data compiled by the other major international education assessment program (PISA) because TIMSS includes more rentier countries than the latter.²⁰ Hence, the countries included in the TIMSS data depict more variation along one of our core independent variables.

Because the TIMSS data include only a small sample of countries, we use two additional sets of dependent variables to ensure the robustness of our findings. The first one is taken from Altinok et al. (2013). The authors combine extant international and regional assessments of student school performance to create an aggregate indicator of education quality. We use both their primary and secondary education quality measures. As more recent data for primary school test performance was unavailable, all data refer to 2007. Finally, we use two questions from the World Economic Forum's (WEF 2014) *Global Competitiveness Report*. We rely on the report's expert assessments of the *quality of primary education*²¹ and the extent to which a country's education system *meets the needs of a competitive economy*.²²

¹⁷ In Appendix A2, we report and discuss estimation results obtained when the other DALY measures are used. See Footnote 31 below for details.

¹⁸ Arguably, we would benefit from testing the hypotheses with an indicator of returns to education. However, extant data on returns to education lack cross-country comparability and are primarily from Western European countries.

¹⁹ See http://timssandpirls.bc.edu/home/pdf/TP_About.pdf for details (retrieved 11/22/2014).

²⁰ In fact, the average country participating in the 2011 eighth grade TIMSS math study had a rent revenue of about 2,100 USD per capita, while the average country participating in the most recent PISA (2012) math study had a rent revenue of only 1,180 USD per capita.

²¹ "In your country, how would you assess the quality of primary schools? [1 = extremely poor—among the worst in the world; 7 = excellent—among the best in the world]?"

²² "How well does the education system in your country meet the needs of a competitive economy [1 = not well at all; 7 = extremely well]?"

Crucially, we argue that citizens' demand for education declines when they can count on a high standard of living regardless of their educational attainment. Several factors may explain when people are confident about their future earnings regardless of their level of education—for example, being a member of an autocratic winning coalition, from a rich business family, or a country that guarantees well-paid public sector jobs and robust social safety nets to its citizens. In this paper, we focus on the latter, as it affects the incentives of all citizens to demand high quality education. Hence, our first main independent variable is *oil and gas rents*. As discussed above, *rentier economies* use their income in natural resource rents to finance well-paid public sector jobs, thus guaranteeing their citizens a high standard of living regardless of their educational attainment.

We use several indicators from Ross (2013) to measure the total value of oil and gas exports per year in constant 2000 US Dollars.²³ We divide this measure by population (using data from the Penn World Tables 7.1, Heston et al. 2013) to create our measure of *oil and gas rents per capita*. Often, rents are calculated as a share of GDP, but we prefer taking per capita values because oil and gas exports as a share of GDP depend on fluctuations of the economy and they cannot tell how many rents an individual could—in theory—receive. We expect diminishing marginal returns of rents and take the natural logarithm of this variable.

We employ four different indicators of our second core independent variable—institutions. These indicators focus on different aspects of institutional quality and are used to ensure the robustness of our findings. Our first indicator is the Political Risk Services' (PRS 2013) *Quality of Government*. It is the average of corruption, law and order, and quality of the bureaucracy. Further, we use three of the World Bank's Worldwide Governance Indicators (Kaufmann et al. 2010; World Bank 2014a): *government effectiveness* assesses the quality of the civil service, its independence from political interference, and the quality of policy formulation and implementation, among others. Note that it also measures perceptions of the quality of public services and may therefore be correlated

²³ We proceeded as follows to calculate our rents per capita measure: First, we use Ross' (2013) data on oil exports (in 1,000 barrels per day) and oil prices (per barrel in constant 2000 USD) to calculate the total value of oil exports per year (oil exports * oil price * 1,000 barrels * 365 days). Next, we use Ross' (2013) data on gas exports (in billion cubic feet per year) and gas prices (per 1 million British thermal units in constant 2000 USD). As one million British thermal units roughly equals 1,000 cubic feet, the gas price has to be multiplied by 1,000,000. Multiplying by gas exports results in the total value of gas exports per year. Finally, we add both indicators to create a measure of total gas and oil exports per year.

with our dependent variables. Further, we use the *rule of law* indicator, which assesses contract enforcement, the quality of property rights, the police, and the judiciary, and the extent to which agents abide by the rules of society. Finally, *control of corruption* measures the extent to which public power is exercised for private gain and/or whether the state is captured by private interests. Higher values on all four measures of institutional quality reflect stronger institutions.

3b. Estimation Strategy, Regression Models, and Control Variables

Our main dependent variables are not available yearly; consequently, we employ cross-sectional regression analysis. All independent variables are averaged over the preceding five years. This has several advantages. First, it reduces the influence of unusual observations, thus minimizing noise in the data. Second, we can remain agnostic about the pace with which an independent variable affects the outcome and do not have to impose an arbitrary time lag on our independent variables. Third, it mitigates problems of reverse causation.

We estimate two sets of regression models. The first one regresses health outcomes on rents, institutional quality, and controls and can be written as

$$(1) H_{i,2012} = \alpha + \beta_1 R_{i,\emptyset(2007-10)} + \beta_2 IQ_{i,\emptyset(2007-11)} + \beta \mathbf{X}_i + \varepsilon_i,$$

where i denotes the country, $H_{i,2012}$ is health outcomes in 2012, α is the constant, $R_{i,\emptyset(2007-10)}$ is our measure of oil and gas rents, averaged over 2007 to 2010,²⁴ $IQ_{i,\emptyset(2007-11)}$ represents average institutional quality over the preceding five years, \mathbf{X}_i is a vector of control covariates, and ε_i is the error term.

We control for the “wealthier is healthier” hypothesis (Pritchett and Summers 1996; McGuire 2010) using *GDP per capita* (source: World Bank 2014b). Expecting diminishing marginal returns, we use the natural logarithm of this indicator. Government expenditure on health can be positively associated with certain health outcomes (Filmer and Pritchett 1999; Bradley et al. 2011). We use data from the World Bank (2014) to construct a

²⁴ Note that our measure of oil and gas rents is only available until 2010, such that we cannot include averages over the preceding five years, but four-year averages over 2007 to 2010.

measure of *per capita government spending on health*.²⁵ Urbanization can be associated with better health outcomes (Wigley and Akkoyunlu-Wigley 2011). However, living in cities can also be associated with a change in lifestyle, a reduction in physical activity, and a decline in health status (Assah et al. 2011). Hence, we control for the level of *urbanization* (source: World Bank 2014b). The elderly population suffers disproportionately from diseases and disabilities and may thus affect the demand for health (Center for Health Workforce Studies 2006). Therefore, we control for the *old age dependency ratio*, measured as the number of people aged 65 and above as share of the working-age population (source: World Bank 2014b). Research on autocratic politics contends that the provision of public goods such as health or education is lower in authoritarian regimes because dictators need to appease the members of their ruling coalition by spending their revenue on private rather than public goods (see, for instance, Bueno de Mesquita et al. 2003; Svobik 2012). We control for regime type with the revised combined polity score (Marshall et al. 2014). Finally, we control for *ethnic heterogeneity*, using Alesina et al.’s (2003) measure of ethnic fractionalization. This variable reflects the probability that two randomly chosen citizens of a given country are not of the same ethnic group. Ethnic heterogeneity is often said to be detrimental to public goods provision (e.g., Habyarimana et al. 2009). Our models also control for world regions, using data from Hadenius and Teorell (2005), adjusting the coding slightly.²⁶

Our second set of regression models regresses education outcomes on rents, institutional quality, and controls. Similarly to above it can be written as

$$(2) E_{i,t} = \alpha + \beta_1 R_{i,\emptyset((t-6)-(t-1))} + \beta_2 IQ_{i,\emptyset((t-6)-(t-1))} + \beta X_{i,\emptyset((t-6)-(t-1))} + \varepsilon_i.$$

$E_{i,t}$ refers to country i 's TIMSS data in 2011, its Altinok et al. (2013) data in 2007, and its 2012 WEF data. As before, all independent variables are averaged over the preceding five years. Due to the limited number of data points available, we cannot include as many covariates as before. That is, we restrict the set of controls to GDP per capita and per capita spending on education when analyzing the Altinok et al. (2013) and TIMSS (2011)

²⁵ The World Bank does not include a direct measure of per capita government expenditure on health. The following procedure was used to generate such a measure: first, we multiply the World Bank's indicator of total public spending on health in % GDP by its measure of GDP (measured in constant 2005 USD). Then, we divide by population.

²⁶ Hadenius and Teorell (2005) define ten world regions, while we add the Caribbean to Latin America. Also, the authors add New Zealand and Australia to “Western Europe and North America”, while we add these countries to “Australia and the Pacific”.

data. In contrast, we include the full set of controls in the WEF regressions because data are available for up to 115 countries.

Table 4 provides the descriptive statistics of all main variables. Due to our different sample sizes, we report two sets of statistics, one for all countries (top panel), and one only for those countries for which TIMSS data are available (bottom panel).²⁷

3c. Oil and gas rents and health service provision

Table 5 reports eight models that regress Disability-Adjusted Life Years (Models 1 through 4) and age-standardized mortality rates (Models 5 through 8) on our independent and control variables. All models include rents and all control variables. The only difference lies in the measure of institutional quality included. Models 1 and 5 use the quality of government, models 2 and 6 government effectiveness, models 3 and 7 rule of law, and models 4 and 8 control of corruption.

Above, we have hypothesized that rents are not associated with health outcomes, as people demand high-quality health service provision regardless of the amount of rents available. This hypothesis receives considerable support across all eight models. With one exception, rents are not statistically significantly correlated with health outcomes. While rents have a statistically significant effect on the mortality rate in Model 5, the effect is only marginally significant. In contrast, there is evidence that better institutional quality is associated, *ceteris paribus*, with fewer DALYs and a lower mortality rate. However, the coefficients are not statistically significant across all models.

²⁷ Our health and institution regressions include controls for world region and colonial legacy. The coefficients of these dummies are not reported in the text, but can be found in the tables in Appendix A1.

Table 4: Descriptive statistics

<i>DV = health outcomes</i>						
	N	Min	Max	Mean	SD	Median
Control of corruption (Ø 2007-11)	193	-1.8	2.48	-0.07	0.99	-0.31
DALY, noncommunicable diseases, per capita (2012)	172	0.11	0.4	0.21	0.06	0.2
Ethnic heterogeneity	186	0	0.93	0.44	0.26	0.43
GDP per capita (Ø 2007-11)	187	150.28	152971.7	11435.15	19753.97	3341.89
GDP per capita, ln (Ø 2007-11)	187	5.01	11.94	8.18	1.61	8.11
Government effectiveness (Ø 2007-11)	193	-2.29	2.3	-0.07	0.99	-0.25
Health expenditure per capita (Ø 2007-11)	184	2.92	5409.81	582.02	1095.02	125.78
Mortality rate, noncommunicable diseases (2012)	172	244.22	1025.12	564.15	166.04	569.54
Old age dependency ratio (Ø 2007-11)	184	0.47	34.73	11.44	7.36	8.37
Polity IV (Ø 2007-11)	165	-10	10	3.83	6.24	6
Quality of government (Ø 2007-11)	139	0.08	1	0.53	0.2	0.48
Rents per capita (Ø 2007-10)	167	0	37626.27	920.74	3709.69	0.42
Rents per capita, ln (Ø 2007-10)	167	0	10.51	2.37	3.03	0.25
Rule of law (Ø 2007-11)	195	-2.52	1.94	-0.08	0.99	-0.3
Urbanization (Ø 2007-11)	190	10.4	100	55.3	23.27	55.51
<i>DV = education service delivery</i>						
TIMSS score for 4th graders in math (2011)	48	248.00	606.00	480.96	71.53	495.50
TIMSS score for 4th graders in science (2011)	44	209.00	587.00	482.93	79.12	510.00
TIMSS score for 8th graders in math (2011)	44	330.83	612.79	453.52	71.30	450.91
TIMSS score for 8th graders in science (2011)	42	306.00	590.00	467.64	64.78	465.00
Rents per capita (Ø 2006-10)	58	0.00	36629.88	1647.92	5530.50	9.88
Rents per capita, ln (Ø 2006-10)	58	0.00	10.49	3.03	3.23	2.07
Quality of government (Ø 2006-10)	57	0.31	1.00	0.64	0.19	0.61
Government effectiveness (Ø 2006-10)	59	-0.95	2.30	0.63	0.86	0.57
Rule of law (Ø 2006-10)for	59	-1.02	1.95	0.52	0.91	0.51
Control of corruption (Ø 2006-10)	59	-1.07	2.50	0.49	1.03	0.29
GDP per capita (Ø 2006-10)	58	563.81	66246.42	17663.47	16840.73	11010.80
GDP per capita, ln (Ø 2006-10)	58	6.33	11.10	9.17	1.24	9.31
Education expenditure per capita (Ø 2006-10)	53	30.91	4456.89	934.38	1019.36	540.47

Most of the control variables included in Table 5 are not statistically significant across all model specifications. The only exception is the old age dependency ratio. As expected, a higher share of the elderly population increases, *ceteris paribus*, the number of Disability-Adjusted Life Years in models 1 through 4. The effect is highly statistically significant. However, the same variable has a statistically significant negative effect on the mortality rate (models 5 to 8); older people have lived longer already.

As shown in this section, there is no difference in health outcomes between rentier and non-rentier economies. Yet, according to our argument, we expect statistically significant differences in education performance between rentier and non-rentier countries. We turn to a test of this argument next.

Table 5: The impact of oil and gas rents on health outcomes

	<i>DV = DALY due to non-communicable diseases, per capita (2012)</i>				<i>DV = Mortality rate due to non-communicable diseases (2012)</i>			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Rents per capita, ln (Ø 2007-10)	0.002 (0.00)	0.002 (0.00)	0.002 (0.00)	0.001 (0.00)	7.444* (4.06)	4.705 (3.70)	5.177 (3.87)	4.877 (4.02)
Quality of government (Ø 2007-11)	-0.036 (0.03)				-126.640 (99.62)			
Government effectiveness (Ø 2007-11)		-0.013** (0.01)				-49.058** (19.30)		
Rule of law (Ø 2007-11)			-0.010 (0.01)				-38.982* (19.93)	
Control of corruption (Ø 2007-11)				-0.012** (0.01)				-36.955** (16.99)
GDP per capita, ln (Ø 2007-11)	-0.011* (0.01)	0.001 (0.01)	-0.000 (0.01)	-0.000 (0.01)	-58.775*** (19.91)	-22.433 (16.33)	-27.153 (17.94)	-30.722* (16.88)
Health expenditure p.c. (Ø 2007-11)	-0.000 (0.00)	-0.000 (0.00)	-0.000 (0.00)	-0.000 (0.00)	-0.001 (0.01)	-0.011 (0.01)	-0.013 (0.02)	-0.007 (0.02)
Urbanization (Ø 2007-11)	-0.000 (0.00)	-0.000 (0.00)	-0.000 (0.00)	-0.000 (0.00)	-0.585 (1.33)	-0.985 (1.07)	-0.935 (1.07)	-0.740 (1.09)
Old age dependency ratio (Ø 2007-11)	0.005*** (0.00)	0.005*** (0.00)	0.005*** (0.00)	0.005*** (0.00)	-7.912*** (2.60)	-8.716*** (2.38)	-8.779*** (2.46)	-8.909*** (2.48)
Polity IV (Ø 2007-11)	0.000 (0.00)	0.001 (0.00)	0.000 (0.00)	0.000 (0.00)	4.118* (2.40)	3.126 (2.02)	2.809 (2.08)	2.294 (2.11)
Ethnic fractionalization	0.022 (0.01)	0.010 (0.01)	0.007 (0.01)	0.007 (0.01)	67.294 (55.29)	50.977 (47.08)	40.896 (48.37)	39.438 (48.69)
World region dummies included?	YES	YES	YES	YES	YES	YES	YES	YES
Constant	0.267*** (0.05)	0.144*** (0.05)	0.157*** (0.05)	0.151*** (0.05)	1238.005*** (141.93)	925.156*** (128.00)	964.207*** (142.91)	978.859*** (131.58)
N	122	148	148	148	123	149	149	149
Adj. R ²	0.774	0.728	0.723	0.727	0.619	0.625	0.618	0.619
Prob > F	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Robust standard errors in parentheses. * p<0.10, ** p<0.05, *** p<0.01.

3d. Oil and gas rents and education service provision

As discussed above, it is hard to find comparative data on education quality across the world. Therefore, we employ six indicators from three different data sets to measure education outcomes. We estimate four models for each indicator—one for each of the four measures of institutional quality. All models are summarized in Table 6.²⁸ They provide substantial support for a negative effect of oil and gas rents on education outcomes.

With respect to the TIMSS scores (Models 9 through 16), we find statistically significant effects of per capita rent income on education performance in six of the eight models. The estimated coefficients in models 13 and 14 lack statistical significance, but still slope

²⁸ For the full results, see Appendix A3.

negatively. This lack of statistical significance is likely to be driven by the performance of eighth graders in science: when we further disaggregate the data and run separate regressions by grade *and* subject, we find that rents are statistically significantly negatively associated with education outcomes for fourth graders in both subjects and for eighth graders in math, while the coefficient lacks significance for eighth graders' science score (Appendix A3).

The effect of oil and gas rents on education outcomes is also substantively important. According to Table 6, an increase in our rent variable from 0 to 10 (equaling about 22,000 USD per capita in unearned foreign income—roughly the rent income in Kuwait, Qatar, and UAE) decreases the TIMSS scores by at least 50 (Model 15, $p < 0.1$) and up to 100 points (Model 11, $p < 0.01$). Compared to an interquartile range of about 75 (fourth graders) to 95 points (eighth graders), this effect is huge.²⁹

The results are largely the same when the Altinok et al. (2013) education data are used. While all coefficient slope negatively, however, three of them lack statistical significance (Models 17 to 19). That is, Models 17 to 24 suggest that rent income affects in particular the quality of secondary education. The estimates in Models 21 to 24 point to a substantively large effect of natural resource rents on education: increasing log rent income from 0 to 10 reduces education performance by 45 (Model 22, $p < 0.1$) to 75 (Model 24, $p < 0.05$) point—equaling about 0.61 to 1 standard deviations (SD).

The coefficient of interest is statistically significant across all eight models when the two indicators from the WEF's (2014) *Global Competitiveness Report* are used to measure education quality. All else equal, experts state that the quality of a country's primary education is lower in countries with higher rent income. Similarly, a country's education system is less able to meet the needs of a competitive economy as its rent income increases. Increasing rents from minimum to maximum reduces experts' assessments of the quality of a country's primary education by 0.72 (Model 26) to 0.83 points (Model 25), equaling 0.66 to 0.76 SD ($p < 0.05$). Similarly, such an increase in rent income reduces experts' opinion on how a country's education system meets the needs of a competitive economy by 0.62 (Model 30) to 0.81 SD (Model 29) ($p < 0.05$).

²⁹ For fourth graders, the 25th percentile is at 451.5 and the 75th percentile is 525.75. For eighth graders, the percentiles lie at 416.57 and 511.9, respectively.

The preceding regression analysis does not yield clear results as to the effect of institutions on education performance. Institutional quality turned out to be uncorrelated with the TIMSS education scores across all models, while institutions had a positive effect on the quality of primary and secondary education in four of the eight models using the Altinok et al. (2013) data. The WEF regressions provide more unambiguous support for a positive effect of institutions on education quality. The effect of institutions in these models is substantial. Improving the quality of government from its minimum to its maximum increases the quality of primary education (competitiveness of the education system) by 1.2 (1.5) SD ($p < 0.1$ ($p < 0.05$)). Moving government effectiveness from its minimum to its maximum value, in turn, increases the competitiveness of the education system by 2.3 SD ($p < 0.01$).

Table 6: The impact of oil and gas rents on education outcomes

	DV = Average TIMSS score for 4th graders, 2011				DV = Average TIMSS score for 8th graders, 2011			
	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
	<i>QoG</i>	<i>GE</i>	<i>RoL</i>	<i>CoC</i>	<i>QoG</i>	<i>GE</i>	<i>RoL</i>	<i>CoC</i>
TIMSS 2011								
Rents per capita, ln (Ø 2006-10)	-8.264** (3.107)	-6.108* (3.165)	-10.142*** (3.310)	-9.501*** (3.400)	-3.819 (2.987)	-4.018 (2.899)	-5.446* (3.073)	-5.686* (3.147)
Institutional Quality (Ø 2006-10)	3.965 (97.544)	29.230 (18.972)	-21.977 (22.965)	-14.574 (17.688)	52.799 (91.292)	4.917 (17.130)	-17.248 (20.449)	-18.375 (17.468)
N	40	41	41	41	35	36	36	36
Adj. R ²	0.418	0.439	0.426	0.424	0.379	0.381	0.394	0.407
Prob > F	0.003	0.003	0.000	0.001	0.000	0.000	0.000	0.000
	DV = Quality of primary education, 2007				DV = Quality of secondary education, 2007			
	<i>QoG</i>	<i>GE</i>	<i>RoL</i>	<i>CoC</i>	<i>QoG</i>	<i>GE</i>	<i>RoL</i>	<i>CoC</i>
	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)
Atinok et al. 2013								
Rents per capita, ln (Ø 2006-10)	-7.148 (5.270)	-5.040 (5.177)	-7.535 (5.456)	-10.099* (5.404)	-6.953** (3.011)	-4.498* (2.627)	-6.600** (3.211)	-7.548** (3.349)
Institutional Quality (Ø 2006-10)	226.421** (106.796)	52.516** (22.948)	22.250 (21.416)	-4.486 (24.972)	161.938* (84.355)	57.917*** (18.266)	26.463 (19.613)	12.750 (18.421)
N	51	61	61	61	67	69	69	69
Adj. R ²	0.419	0.430	0.398	0.391	0.350	0.443	0.364	0.348
Prob > F	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	DV = Quality of Primary Education, 2012				DV = Meeting the Needs of a Competitive Economy, 2012			
	<i>QoG</i>	<i>GE</i>	<i>RoL</i>	<i>CoC</i>	<i>QoG</i>	<i>GE</i>	<i>RoL</i>	<i>CoC</i>
	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)
WEF 2014								
Rents per capita, ln (Ø 2006-10)	-0.083** (0.035)	-0.072** (0.033)	-0.077** (0.035)	-0.074** (0.035)	-0.073** (0.029)	-0.056** (0.026)	-0.059** (0.028)	-0.059** (0.027)
Institutional Quality (Ø 2006-10)	1.317* (0.789)	0.377* (0.203)	0.266 (0.209)	0.318* (0.184)	1.422** (0.670)	0.415*** (0.158)	0.327* (0.183)	0.334** (0.161)
N	100	115	115	115	100	115	115	115
Adj. R ²	0.618	0.626	0.620	0.626	0.553	0.574	0.567	0.570
Prob > F	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Robust standard errors in parentheses. * p<0.10, ** p<0.05, *** p<0.01. QoG = Quality of Government; GE = Government Effectiveness; RoL = Rule of Law; CoC = Control of Corruption.								

3e. Conclusion

The preceding analyses provide ample support for our argument that the effects of labor market structure as measured by oil and gas rents on social service provision differ across sectors. When looking at outcome measures, oil and gas rents are associated with a statistically significant decrease in education performance, while they have no discernible effect on health performance, all else being equal. This supports H1. Demand for education, in turn, differs across rentier and non-rentier economies. This supports H2.

As to the impact of institutions on social service provision, our results are mixed at best. Institutional quality was only statistically significant in some of our health and education regression models. Hence, we have to reject H3.

Our results thus suggest that people demand high-quality health regardless of the amount of unearned foreign income available in a country.³⁰ By contrast, holding supply factors constant, the negative coefficient of the rents variable points to a negative effect of oil and gas rents on the demand for education provision.

4. The Demand for Education in Rentier and Non-Rentier MENA Economies

4a. Case Selection

Our explanation for these results is simple: citizens in rentier economies are less concerned with attaining high quality education, as students and their parents do not see education as critical to their future career; in the rentier system they will be able to obtain good jobs and a

³⁰ Above, we argue that DALYs due to NCDs are the most appropriate measure of health outcomes. Nonetheless we conducted a series of robustness checks using alternative dependent variables. All alternative regression models can be found in Appendix A2. Specifically, our alternative dependent variables are DALYs due to (1) communicable diseases, (2) injuries, and (3) all diseases and injuries; mortality rates due (4) communicable diseases, (5) injuries, and (6) all diseases; and (7) maternal mortality ratios. For these dependent variables, we conducted the same set of regression models as above. We find that rent income per capita is statistically significantly positively associated with injuries. However, we believe that injuries do not measure the quality of health provision, but rather workplace and road safety, among others. Rents are further a statistically significant positive determinant of DALYs and mortality rates due to all diseases and injuries. This result, however, is likely to be driven by the impact of rents on injuries, as there is no consistent relationship between rents and communicable diseases. Finally, the lack of statistical significance of rents in the maternal mortality ratio models confirms our argument further. In all these models, institutional quality improves health outcomes significantly.

high standard of living regardless of the quality of education they attain. While unearned foreign income might free citizens from the need to attain high quality education, it has no effect on their health. Hence, citizens still demand high quality health care. The latter part of our argument is straightforward—every human being strives for a good and healthy life. Yet, the argument about the demand for high quality education merits more attention.

To substantiate the claim that rent income lowers demand for high quality education, we now turn to using survey data from the 2011 TIMSS student survey. Figure 1 above underscores not only that the Gulf countries underperform similarly wealthy OECD countries in education service delivery, but also shows that education attainment in the region is not higher than in middle-income MENA countries—despite an overall positive correlation between a country’s income and education performance.

The analysis below examines the demand for education only among the countries in the Middle East and North Africa. Nine MENA countries are included in the most recent TIMSS wave. Of these, we define Jordan, Lebanon, Morocco, and Tunisia as non-rentier (average rents between 2006 and 2010: 1.1% of GDP). The five rentier countries are Kuwait, Oman, Qatar, KSA, and UAE (average rents: 46.9% of GDP).

Restricting the sample to these nine countries holds important alternative explanations for education performance—such as regional and “cultural” factors—constant. As Table 7 reports, several indicators would suggest that education performance should be higher in rentier than in the non-rentier economies. On average, the non-rentier countries are considerably less wealthy than the rentier countries (3,700 USD vs. 34,600 USD). Further, the rentier economies have stronger institutions than Jordan, Lebanon, Morocco, and Tunisia. In addition, per capita public spending on education is considerably higher in the rentier than in the non-rentier countries.

Table 7: Core indicators for MENA countries in TIMSS dataset

		Population (1,000)	Rents p.c.	GDP p.c.	Rents in % GDP	Public spending on education, p.c.	Quality of government	Government effectiveness	Rule of law	Control of corruption
<i>non-rentier</i>	Jordan	5788.8	0	2683.3	0.00%	NA	0.56	0.21	0.35	0.26
	Lebanon	4198.7	0	6194.6	0.00%	130.11	0.45	-0.37	-0.68	-0.87
	Morocco	31000	0	2210	0.00%	122.06	0.61	-0.14	-0.023	-0.32
	Tunisia	10300	155.6	3642.5	4.30%	232.44	0.56	0.4	0.17	-0.12
	average	12821.9	38.9	3682.6	1.08%	161.5	0.55	0.03	-0.05	-0.26
<i>rentier</i>	Kuwait	2703.3	14293.7	33255.7	43.00%	1351.21	0.61	0.15	0.61	0.48
	Oman	2636.8	5801.3	14266.1	40.70%	571.37	0.58	0.38	0.58	0.3
	Qatar	1358.6	36629.9	57412.4	63.80%	1407.99	0.58	0.7	0.82	1.26
	KSA	26300	6232.3	14821	42.10%	791.6	0.56	-0.09	0.18	-0.08
	UAE	6726.3	10928.5	31468.3	34.70%	NA	0.61	0.93	0.41	1.01
	average	11461.6	17930.3	34567.3	46.90%	1099.8	0.58	0.51	0.47	0.73
<i>world Ø</i>	34600	915.8	11338.4	8.10%	530.85	0.53	-0.07	-0.07	-0.07	
<i>world SD</i>	131000	3661	19456.8	18.80%	860.12	0.2	0.99	0.99	0.99	

Note: All values are Ø 2006-10.

Finally, the TIMSS surveys were conducted between March and June 2011—that is, shortly after the Tunisian revolution and, thus, in an environment of considerable political uncertainty. This could further hamper social service provision in these countries, just as the constant political instability in Lebanon (Syria Needs Analysis Project 2013). All these factors bias against finding a higher demand for education in non-rentier countries. That is, any finding suggesting that demand for education is lower in rentier countries would provide strong support for our argument about the detrimental effect of a rentier economic structure on the demand for high quality education delivery.

4b. Empirical Strategy

If citizen demand for high quality education is lower in rentier economies because educational attainment is less important for obtaining a well-paid job in the future, at least two conditions should hold: first, parental support for their children’s educational attainment should be lower in rentier countries, as parents know that their children will obtain a good job and a high standard of living regardless of the quality of education they attain. Second, students in rentier countries should expect that their future career prospect is independent of their educational achievements. They should therefore place less importance on education.

Focusing on MENA in the following empirical analysis allows us to formulate a third observable implication of our argument. A high percentage of the Gulf population is composed of expatriates. Public benefits such as public sector employment, however, are usually tied to citizenship. Excluded from guaranteed high-paying public sector jobs (Herb 2014), non-nationals may face higher incentives to attain high quality education in the Gulf in order to ensure a high standard of living. We should thus expect that the views of national and non-national students in rentier states differ systematically, with non-nationals valuing educational attainment more highly than nationals. By contrast, citizen students in non-rentier economies have the same or higher incentives to demand high quality education than foreigners because they are not protected from labor market competition. Their demand for education may even be higher because they may be more integrated into the education system and labor market, thus enhancing their social and political participation.

We use the TIMSS (2011) survey data to test these three expectations. The TIMSS conducts surveys among the participating students, teachers, school principals, and parents (fourth grade only). In the following, we use the data from the eighth grade³¹ student surveys to examine demand for high quality education because we believe that potential biases in student surveys will be smaller than that in surveys of parents, teachers and school principals. School principals and teachers might have incentives to present their schools in a more favorable light, while few parents may be willing to admit that they do not take care of their children's education. In contrast, we expect eighth grade students to be less affected by social desirability.

We employ a range of questions to measure the demand for education. Our first expectation is that parents' support for their children's education is lower in rentier countries because parents believe their children can achieve a high standard of living regardless of their educational attainment. We use three questions to measure parental support for and interest in their children's education: (1) How often do parents ask what their students learned in school? (2) How often do students talk about schoolwork with their parents? (3) How often do parents make sure that their children set aside enough time for their homework?

³¹ Questions about citizenship are not included in the survey of fourth graders.

Our second expectation is that students in rentier countries perceive their future career prospect to be independent of their educational achievements. For both math and science, we use three questions each to operationalize student demand for education: (4) How important is it to do well in math [science]? (5) Do students need math [science] to get into university? (6) Do students need math [science] to get the job they want?³²

To test our third expectation—namely, that demand for education in (non-) rentier countries depends on citizenship status—we rely on a question in the TIMSS survey that asks students whether their father or male legal guardian was born in the country. In all MENA countries in our sample, only fathers can confer their citizenship to their children (UNHCR 2014).³³ All students who answer this question positively are coded as citizens, while they are coded as foreigners otherwise.³⁴

To test the three expectations formulated above, we regress the various measures of demand for education on a citizenship dummy and a number of controls separately for rentier and non-rentier countries. We control for students' gender and age. Moreover, to control for students' household income, we include a measure of whether students' families' own a computer and have access to the Internet, and whether students have their own room. We also control for the number of books at home. Finally, we control for the education level of students' mothers and fathers. To account for school heterogeneity, school-fixed effects are included and standard errors are clustered by school ID.³⁵ Our coefficient of interest is the citizenship dummy. We expect its sign to be negative in rentier countries, but insignificant or positive in non-rentier countries.

³² All questions analyzed range from 0 (minimum demand) to 3 (maximum demand).

³³ Citizenship legislation changed in Tunisia in 2010, granting women more rights to confer their citizenship to their children. The TIMSS survey data analyzed here were collected in 2011. It is unlikely that education demand changes that quickly. Hence, we do not adjust the coding of citizenship in Tunisia.

³⁴ While this is an admittedly crude measure of citizenship, its summary statistics are as expected. We find that only about 8% of eighth graders in the non-rentier MENA countries are coded as non-citizens, while about 36% of eighth graders in the rentier-countries are foreigners. Among non-rentier countries, only Jordan has a sizable foreign student population (about 20%), which is plausibly due to the high number of Palestinian immigrants and refugees in the country.

³⁵ Note that often, only one class was surveyed per school. That is, including school-fixed effects comes close to controlling for class-specific characteristics. School-fixed effects should also account for country-invariant factors.

4c. Results

Table 8 summarizes the main results. The full models including control variables are reported in Table A12 in Appendix A4. The results provide strong support for our argument that demand for education in the MENA depends on citizenship, conditional on rent income. Across all models, the coefficient of the citizenship variable is negative for the rentier countries, but positive for the non-rentier countries. With one exception (Model 13), the effect of citizenship on demand for education is statistically significant at or above the 10% level in rentier economies.

With respect to parental demand for education, the estimates suggest that the frequency with which parents talk about schoolwork with their children is by 0.134 or 0.13 SD lower among citizen students than among foreign-born students in rentier countries ($p < 0.001$). Similarly parents less frequently make sure that their children set aside enough time for their homework. The difference equals 0.1 SD ($p < 0.001$). By contrast, citizenship in non-rentier countries is associated with more parental demand for education as measured by these two questions: compared to their foreign-born counterparts, parents of citizen students talk more often about schoolwork with their children. The estimate of 0.167 equals 0.16 SD ($p < 0.001$). Likewise, we find a positive effect of citizenship in non-rentier countries when it comes to parents' making sure their children have enough time for their homework. The difference amounts to 0.11 SD ($p < 0.001$). However, for the third question in this group ("How often do parents ask their children what they learned in school?"), the differences are negligible.

Table 8: Demand for Education in Rentier and Non-Countries in the Middle East and North Africa

	How often do your parents ask you what you learned in school?		How often do you talk about schoolwork with your parents?		How often do your parents make sure that you set aside enough time for your homework?		It's important to do well in math		It's important to do well in science	
	(1) <i>Rentier</i>	(2) <i>Non-rentier</i>	(3) <i>Rentier</i>	(4) <i>Non-rentier</i>	(5) <i>Rentier</i>	(6) <i>Non-rentier</i>	(7) <i>Rentier</i>	(8) <i>Non-rentier</i>	(9) <i>Rentier</i>	(10) <i>Non-rentier</i>
Citizen	-0.039 (0.021)	0.073* (0.030)	-0.134*** (0.024)	0.167*** (0.033)	-0.112*** (0.025)	0.115*** (0.035)	-0.142*** (0.016)	0.078** (0.024)	-0.110*** (0.017)	0.014 (0.024)
Constant	2.533*** (0.142)	2.365*** (0.135)	2.307*** (0.169)	2.015*** (0.154)	2.436*** (0.172)	2.889*** (0.159)	2.410*** (0.138)	2.965*** (0.106)	2.474*** (0.143)	3.148*** (0.179)
N	19,443	17,270	19,350	17,138	19,339	17,067	19,384	17,343	19,392	9,043
Adj. R2	0.089	0.060	0.098	0.066	0.090	0.084	0.067	0.037	0.056	0.043
		Need math to get into university		Need math to get the job you want		Need science to get into university		Need science to get the job you want		
		(11) <i>Rentier</i>	(12) <i>Non-rentier</i>	(13) <i>Rentier</i>	(14) <i>Non-rentier</i>	(15) <i>Rentier</i>	(16) <i>Non-rentier</i>	(17) <i>Rentier</i>	(18) <i>Non-rentier</i>	
Citizen		-0.038* (0.016)	0.027 (0.021)	-0.026 (0.019)	0.024 (0.022)	-0.055** (0.019)	0.049 (0.028)	-0.048* (0.021)	0.034 (0.028)	
Constant		2.879*** (0.133)	2.866*** (0.111)	2.724*** (0.150)	2.480*** (0.110)	2.261*** (0.143)	2.949*** (0.188)	2.272*** (0.155)	2.671*** (0.205)	
N		19,313	17,248	19,308	17,236	19,223	8,978	19,250	8,976	
Adj. R2		0.051	0.042	0.042	0.034	0.046	0.048	0.047	0.040	

Notes: *p<0.05; **p<0.01; ***p<0.001. Robust standard errors, clustered by school ID, in parentheses.

Similarly, the difference in student demand for education among citizen and foreign students depends on whether the country relies on oil income or not. We find that citizen students in rentier economies agree less with the statement that it is important to do well in math and science than non-citizen students. In rentier countries, agreement with these statements is 0.19 (0.14) SD lower for math (science) among citizen compared to foreign students ($p < 0.001$). In contrast, citizen students in non-rentier countries agree more that it is important to do well in math (difference: 0.11 SD, $p < 0.01$), while there are no statistically discernible differences between citizens and non-citizens in their agreement that it is important to do well in science, all else being equal.

We find statistically significant differences in demand for education between citizen and foreign-students students in rentier countries for the other questions as well. However, with no more than 0.06 SD, the magnitude of these effects is rather small.

5. Conclusion

Conventional wisdom implies that supply-side factors drive social service delivery, and that the demand for high quality health and education outcomes is high across countries and sectors. This paper challenges these assumptions. Analyzing the impact of natural resource rents on outcomes, it shows that rents impact the demand for services, and the ways in which they do so depends on the type of service. We argue that regardless of the level of rents per capita that a country enjoys, its citizens want good health care. The differences in their ability to achieve it depend primarily on supply side factors, including the nature of political institutions. However, rents per capita play a more direct role when it comes to education. Where rents are high, the demand for education is considerably lower. Education is not as important for students and parents who know that they can obtain a high standard of living regardless of their success in school. Not surprisingly, then, we find that education outcomes are inversely related to the level of rents per capita.

This paper presents evidence in support of our argument drawn from both cross-sectional regression analyses of health and education outcomes and survey data from the TIMSS. We find that rents are associated with a statistically significant decrease in education

performance, but have no discernible effect on health performance. Looking more closely at demand for education through student surveys in the MENA, we find that parental support for their children's educational attainment is lower in rentier countries, and that students themselves regard educational attainment as less important for their future careers. Most importantly, the public sector benefits of the rentier economy are tied to citizenship status. Therefore, we find that demand for high quality education is lower among citizens than among foreign students in rentier countries, while the opposite is true in non-rentier economies.

The findings have important implications for development study. First, they call on us to recognize that performance outcomes in health and education cannot be simply seen as proxies for service provision. Outcomes are driven by demand as well as supply side factors. Second, they suggest that we need to reconsider the generalizability of analyses based in specific countries. Experimental and quasi-experimental studies are often viewed as particularly generalizable because they take identification problems seriously. Yet, there are reasons to believe that such programs are placed in areas with more highly engaged (and demanding) citizens and findings do not necessarily carry in environments where citizen demands are low. Third, the study highlights the role that rents play in service delivery and outcomes. Many have recognized the impact of oil on political institutions, regime type, and economic growth, but few have considered the impact on demands for health and education.

The analysis also suggests that policymakers and practitioners take into account both supply and demand side forces when formulating projects aimed at increasing quality service provision. A good example of this approach is found in the UAE, which is implementing an educational reform program based on the notion that *students and their parents need incentives* to get them to invest in education. Rather than citizen demand driving policymaking, it is policymakers who are attempting to create citizen demands (and investment) in education (Jones 2015).

Policymakers and analysts should consider other factors that affect the demand for services as well. At the sectoral level, a focus on demand can help us to consider differences in the level of demand for issues like solid waste management over quality education services. The

first is highly visible and affects all residents, while the latter is less visible and affects those with children. We should anticipate higher demand for the former than the latter and, *ceteris paribus*, investment in garbage collection at levels that may exceed marginal returns. Or, at the individual level, we may anticipate that students of particularly wealthy, well-connected families may invest minimally in education, performing poorly because they may recognize (even rightfully so) that their returns to investment are small. Finding ways to allocate resources or incentivize performance needs to take citizen demand into account. Ultimately the success of initiatives to improve service provision depends on recognizing both supply and demand side forces.

References

Acemoglu, Daron / Robinson, James (2013): *Why Nations Fail: The Origins of Power, Prosperity, and Poverty*. New York, NY: Crown Publishers.

Alesina, Alberto / Devleeschauwer, Arnaud / Easterly, William / Kurlat, Sergio / Wacziarg, Romain (2003): "Fractionalization." *Journal of Economic Growth* 8(2): 155-194.

Alesina, Alberto / La Ferrara, Eliana (2005): "Preference for redistribution in the land of opportunities." *Journal of Public Economics* 89(5-6): 897-931.

Alexeev, Michael / Conrad, Robert (2009): "The Elusive Curse of Oil." *The Review of Economics and Statistics* 91(3): 586-598.

AlMadhoun, Said (2012): "Access to information in the Middle East and North Africa Region: An overview of recent developments in Jordan, Lebanon, Morocco and Tunisia." Washington, DC: World Bank. Available at http://wbi.worldbank.org/wbi/Data/wbi/wbicms/files/drupal-acquia/wbi/Almadhoun-ATI_in_MNA_Region_ENGLISH.pdf (retrieved 10/16/2014).

Almond, Gabriel A. / Verba, Sidney (1963): *The Civic Culture*. Boston: Little Brown.
Al-Qudsi, Sulayman S. (2006): *Unemployment evolution in the GCC economies: its nature and relationship to output gaps*. Dubai, UAE: Center for Labor Market Research and Information.

Altinok, Nadir / Diebolt, Claude / de Meulemester, Jean-Luc (2013): "A New International Database on Education Quality: 1965-2010." Available at <http://www.beta-umr7522.fr/Datasets?lang=fr> (retrieved 06/24/2015).

Alwan, Ala (2011): *Global status report noncommunicable diseases 2010*. Geneva: World Health Organization. Available at http://www.who.int/nmh/publications/ncd_report_full_en.pdf (retrieved 11/24/2014).

Amable, Bruno (2009): "The Differentiation of Social Demands in Europe: The Social Basis of the European Model of Capitalism." *Social Indicators Research* 91(3): 391-246.

Angrist, Joshua / Bettinger, Eric / Bloom, Erik / King, Elizabeth / Kraemer, Michael (2002): "Vouchers for private schooling in Colombia: Evidence from a randomized natural experiment." *American Economic Review* 92(5): 1535-1558.

Aslaksen, Silje (2010): "Oil and democracy: More than a cross-country correlation?" *Journal of Peace Research* 47(4): 421-431.

Assah, Felix K. / Ekelund, Ulf / Brage, Soren / Mbanya, Jean Claude / Wareham, Nicholas J. (2011): "Urbanization, Physical Activity, and Metabolic Health in Sub-Saharan Africa." *Diabetes Care* 34(2): 491-496.

- Barber, Sarah L. / Gertler, Paul J. (2009): "Empowering women to obtain care: evidence from an evaluation of Mexico's conditional cash transfer programme." *Health Policy and Planning* 24(1): 18-25.
- Bately, Richard / McLoughlin, Claire (2015): "The politics of public services: A service characteristics approach." *World Development* 74: 275-285.
- Beblawi, Hazem (1987): "The Rentier State in the Arab World." In *The Rentier State*, edited by Hazem Beblawi and Giacomo Luciani. New York: Croom Helm: 49-62.
- Bermeo, Nancy / Yashar, Deborah (2014): "Parties, Movements, and Democracy in the Developing World." Presented at the annual meeting of the American Political Science Association, Washington, DC, August, 28-31, 2014.
- Björkman, Martina / Svensson, Jakob (2009). "Power to the People: Evidence from a Randomized Field Experiment on Community-Based Monitoring in Uganda." *Quarterly Journal of Economics* 124(2): 735-769.
- Blekesaune, Morten / Quadagno, Jill (2003): "Public Attitudes toward Welfare State Policies: A Comparative Analysis of 24 Nations." *European Sociological Review* 19(5): 415-427.
- Boix, Carles (2011): "Democracy, Development, and the International System." *American Political Science Review* 105(4): 809-828.
- Boix, Carles / Stokes, Susan C. (2003): "Endogenous Democratization." *World Politics* 55(4): 517-549.
- Bradley, Elizabeth H. / Elkins, Benjamin R. / Herrin, Jeph / Elbel, Brian (2011): "Health and social services expenditures: associations with health outcomes." *BMJ Quality & Safety* 20(10): 826-831.
- Brixi, Hana / Lust, Ellen / Woolcock, Michael (2015): *Trust, Voice, and Incentives: Learning from Local Successes in Service Delivery in the Middle East and North Africa*. Washington, DC: The World Bank.
- Bueno de Mesquita, Bruce / Morrow, James D. / Siverson, Randolph / Smith, Alastair (2003): *The Logic of Political Survival*. Cambridge, MA: MIT Press.
- Bulte, Erwin H. / Damania, Richard / Deacon, Robert T. (2005): "Resource Intensity, Institutions, and Development." *World Development* 33(7): 1029-1044.
- Center for Health Workforce Studies (2006): *The Impact of the Aging Population on the Health Workforce in the United States: Summary of Key Findings*. Rensselaer, NY: Center for Health Workforce Studies, School of Public Health, University at Albany. Available at http://www.albany.edu/news/pdf_files/impact_of_aging_excerpt.pdf (retrieved 11/24/2014).

- Charron, Nicholas / Lapuente, Victor (2010): "Does democracy produce quality of government?" *European Journal of Political Research* 49(4): 443-470.
- Chaudhary, Suchitra (2015): New Center to Make Dubai a Hub of Health Care Research. Gulf News. Available at <http://gulfnews.com/news/gulf/uae/health/new-centre-to-make-dubai-a-hub-of-health-care-research-1.1443964> (retrieved 03/17/2015).
- Chaudhry, Kiren Aziz (1997): *The Price of Wealth: Economics and Institutions in the Middle East*. Ithaca, NY: Cornell University Press.
- Chimhutu, Victor / Lindkvist, Ida / Lange, Siri (2014): "When incentives work too well: locally implemented pay for performance (P4P) and adverse sanctions towards home birth in Tanzania - a qualitative study." *BMC Health Services Research* 18(1): 14-23.
- Contreras, Dante / Rau, Tomás (2012): "Tournament Incentives for Teachers: Evidence from a Scaled-Up Intervention in Chile" *Economic Development and Cultural Change* 61(1): 219-246.
- Corneo, Giacomo / Grüner, Hans Peter (2002): "Individual preferences for political redistribution." *Journal of Public Economics* 83(1): 83-107.
- Cusack, Thomas / Iversen, Torben / Rehm, Philipp (2006): "Risks at Work: The Demand and Supply Sides of Government Redistribution." *Oxford Review of Economic Policy* 22(3): 365-389.
- Dammert, Ana C. (2008): "Heterogeneous Impacts of Conditional Cash Transfers: Evidence from Nicaragua." *IZA Discussion Paper* 3653.
- Davis, Jennifer (2004): "Corruption in Public Service Delivery: Experience from South Asia's Water and Sanitation Sector." *World Development* 32(1): 53-71.
- De Hollander, Augustinus E. M. / Melse, Johan M. / Lebet, Erik / Kramers, Pieter G. N. (1999): "An Aggregate Public Health Indicator to Represent the Impact of Multiple Environmental Exposures." *Epidemiology* 10(5): 606-617.
- De la O, Ana (2013): "Do Conditional Cash Transfers Affect Electoral Behavior? Evidence from a Randomized Experiment in Mexico." *American Journal of Political Science* 57(1): 1-14.
- Deutsch, Karl W. (1964): "Social mobilization and political development." *American Political Science Review* 55(3): 493-514.
- Diamond, Larry / Plattner, Marc F. (1995): *Economic Reform and Democracy*. Baltimore, MD: Johns Hopkins University Press.
- Drèze, Jean / Sen, Amartya (1989): "China and India." In *Hunger and Public Action*, edited by Jean Drèze and Amartya Sen, Oxford, U.K.: Oxford University Press: 204–25.

- Duflo, Esther / Hanna, Rema / Ryan, Stephen P. (2012): "Incentives Works: Getting Teachers to Come to School." *American Economic Review* 102(4): 1241-1278.
- Dunning, Thad (2008): *Crude Democracy: Natural Resource Wealth and Political Regimes*. New York, NY: Cambridge University Press.
- Epstein, David L. / Bates, Robert / Goldstone, Jack / Kristensen, Ida / O'Halloran, Sharyin (2006): "Democratic Transitions." *American Journal of Political Science* 50(3): 551-569.
- Faour, Muhammad (2012): *The Arab World's Education Report Card: School Climate and Citizenship Skills*. Washington, DC: Carnegie Endowment for International Peace.
- Fernald, Lia C.H. / Gertler, Paul J. / Neufeld, Lynnette M. (2009): "10-year Effect of Oportunidades, Mexico's Conditional Cash Transfer Programme, On Child Growth, Cognition, Language and Behaviour: a longitudinal follow-up study." *The Lancet* 374: 1997-2005.
- Fernández-Albertosa, José / Manzano, Dulce (2016): "Dualism and support for the welfare state." *Comparative European Politics* 14(3): 349-375.
- Filmer, Deon / Pritchett, Lant (1999): "The impact of public spending on health: does money matter?" *Social Science & Medicine* 49(10): 1309-1323.
- Fong, Christina (2001): "Social preferences, self-interest, and the demand for redistribution." *Journal of Public Economics* 82(2): 225-246.
- Fujiwara, Thomas (2015): "Voting Technology, Political Responsiveness, and Infant Health: Evidence from Brazil." *Econometrica* 83(2): 423-464.
- Fukuyama, Francis (2012): "The Future of History: Can Liberal Democracy Survive the Decline of the Middle Class?" *Journal of Democracy* 23(1): 14-26.
- Gallup (2013): Gallup World Poll. Available at <http://www.gallup.com/services/170945/world-poll.aspx>.
- Gerring, John / Thacker, Strom C. / Alfaro, Rodrigo (2012): "Democracy and Human Development." *Journal of Politics* 74(1): 1-17.
- Gertler, Paul / Vermeersch, Christel (2013): "Using Performance Incentives to Improve Medical Care Productivity and Health Outcomes." *NBER Working Paper* No. 19046.
- Ghobarah, Hazem Adam / Huth, Paul / Russett, Bruce (2004): "Comparative Public Health: The Political Economy of Human Misery and Well-Being." *International Studies Quarterly* 48(1): 73-94.
- Goldberg, Ellis / Wibbels, Erik / Mvukiyeye, Eric (2008): "Lessons from Strange Cases: Democracy, Development, and the Resource Curse in the U.S. States." *Comparative Political Studies* 41(4/5): 477-514.

Gonzalez, Gabriella C. / Karoly, Lynn A. / Constant, Louay / Salem, Hanine / Goldman, Charles A. (2008): *Facing Human Capital Challenges of the 21st Century: Education and Labor Market Initiatives in Lebanon, Oman, Qatar and the United Arab Emirates*. Arlington, VA: Rand Corporation.

Gupta, Sanjeev / Davoodi, Hamid / Tiongson, Erwin (2000): "Corruption and the Provision of Health Care and Education Services." *IMF Working Paper* WP/00/116. Available at <http://www.imf.org/external/pubs/ft/wp/2000/wp00116.pdf> (retrieved 11/20/2014).

Haber, Stephen / Menaldo, Victor (2011): "Do Natural Resources Fuel Authoritarianism? A Reappraisal of the Resource Curse." *American Political Science Review* 105(1): 1-26.

Habyarimana, James / Humphreys, Macartan / Posner, Daniel N. / Weinstein, Jeremy M. (2009): *Coethnicity: Diversity and the Dilemmas of Collective Action*. New York, NY: Russell Sage Foundation.

Hadenius, Axel / Teorell, Jan (2005): "Assessing Alternative Indices of Democracy." *C&M Working Papers* 6, August 2005.

Hanushek, Eric A. / Raymond, Margaret E. (2005): "Does School Accountability Lead to Improved Student Performance?" *Journal of Policy Analysis and Management* 24(2): 297-327.

Hanushek, Eric A. (2013) "Economic Growth in Developing Countries: The Role of Human Capital," *Economics of Education Review* 37: 204-212.

Hasnain, Zahid (2008): "The Politics of Service Delivery in Pakistan: Political Parties and the Incentives for Patronage, 1988-1999." *Pakistan Development Review* 47(2): 129-51.

Herb, Michael (2005): "No Representation without Taxation? Rents, Development, and Democracy." *Comparative Politics* 37(3): 297-316.

Herb, Michael (2009): "A Nation of Bureaucrats: Political Participation and Economic Diversification in Kuwait and the United Arab Emirates." *International Journal of Middle East Studies* 41(3): 375-95.

Herb, Michael (2014): *The Wages of Oil: Parliaments and Economic Development in Kuwait and the UAE*. Ithaca: Cornell University Press.

Heston, Alan / Summers, Robert / Aten, Bettina. (2013): "Penn World Table Version 7.1." Available at https://pwt.sas.upenn.edu/php_site/pwt71/pwt71_form.php (retrieved 08/10/2014).

Huffington Post (2012): "Best Education in the World: Finland, South Korea Top Country Rankings, U.S. Rated Average." *Huffington Post*, 27 November 2012. Available at http://www.huffingtonpost.com/2012/11/27/best-education-in-the-world_n_2199795.html (retrieved 03/15/2015).

Huillery, Elise / Seban, Juliette (2014): "Performance-Based Financing, Motivation and Final Output in the Health Sector: Experimental Evidence from the Democratic Republic of Congo." Unpublished manuscript. Available at: <http://www.povertyactionlab.org/publication/performance-based-fina> (retrieved 03/15/2015).

Huntington, Samuel P. (1968): *Political Order in Changing Societies*. New Haven, CT: Yale University Press.

International Constitutional Law (2010): "Constitution of Kuwait." Available at: <http://www.servat.unibe.ch/icl/ku00000.html> (retrieved 03/08/2015).

Iversen, Torben / Soskice, David (2001): "An Asset Theory of Social Policy Preferences." *American Political Science Review* 95(4): 875-893.

Jensen, Nathan / Wantchekon, Leonard (2004): "Resource Wealth and Political Regimes in Africa." *Comparative Political Studies* 37(7): 816-841.

Jin, Jing / Sklar, Grant E. / Min Sen Oh, Vernon / Chuen Li, Shu (2008): "Factors affecting therapeutic compliance: A review from the patient's perspective." *Therapeutics and Clinical Risk Management* 4(1), 269-286.

Jones, Calvert W. (2015): *Bedouins into Bourgeois: Remaking Citizens for a Global Market Era*, unpublished manuscript. New York, NY: City College of New York.

Jones Luong, Pauline / Weinthal, Erika (2010): *Oil Is Not a Curse: Ownership Structure and Institutions in Soviet Successor States*. Cambridge, UK: Cambridge University Press.

Kaltenthaler, Karl C. / Ceccoli, Stephen J. (2008): "Explaining patterns of support for the provision of citizen welfare." *Journal of European Public Policy* 15(7): 1041-1068.

Karl, Terry L. (1997): *The Paradox of Plenty: Oil Booms and Petro-States*. Berkeley, CA: University of California Press.

Kaufmann, Daniel / Kraay, Aart / Mastruzzi, Massimo (2010): "The Worldwide Governance Indicators: A Summary of Methodology, Data, And Analytical Issues." *World Bank Policy Research Working Paper* 5430.

Kayode, Asaju / Adagba, Sunday O. / Anyio, Silas F. (2013): "Corruption and service delivery: the case of Nigerian public service." *Wudpecker Journal of Public Administration* 1(1): 1-6.

Keefer, Philip / Khemani, Stuti (2005): "Democracy, Public Expenditures, and the Poor: Understanding Political Incentives for Providing Public Services." *The World Bank Research Observer* 20(1): 1-27.

King, Elizabeth / Özler, Berk (2005): “What’s Decentralization Got to Do With Learning? School Autonomy and Student Performance.” Discussion Paper No. 054, Interfaces for Advanced Economic Analysis, Kyoto University.

Kingdom of Bahrain (2002): “Constitution of the Kingdom of Bahran.” Available at: <http://www.wipo.int/edocs/lexdocs/laws/en/bh/bh020en.pdf> (retrieved 03/08/2015).

Kitschelt, Herbert / Wilkinson, Steven I. (2007): “Citizen-politician linkages: an introduction.” In *Patrons, Clients, and Policies: Patterns of Democratic Accountability and Political Competition*, edited by Herbert Kitschelt and Steven I. Wilkinson. Cambridge, UK: Cambridge University Press: 1-49.

Lake, David A. / Baum, Matthew A. (2001): “The Invisible Hand of Democracy: Political Control and the Provision of Public Services.” *Comparative Political Studies* 34(6): 587-621.

Larcinese, Valentino (2006): “Information, Elections and Public Policy in a Rational Choice Perspective.” Unpublished Manuscript. Available at http://personal.lse.ac.uk/LARCINES/Summer_School_08/Survey_PSR.pdf (retrieved 11/23/2014).

Lavy, Victor (2002): “Evaluating the Effect of Teachers’ Group Performance Incentives on Pupil Achievement.” *Journal of Political Economy* 110(6): 1286-1317.

Lerner, Daniel (1958): *The Passing of Traditional Society*. New York: Free Press.

Maravall, José M. (1994): “The Myth of the Authoritarian Advantage.” *Journal of Democracy* 5(4): 17–31.

Marshall, Monty G. / Jagers, Keith / Gurr, Ted Robert (2014): “Polity IV Annual Time-Series 1800-2013.” Available at <http://www.systemicpeace.org/> (retrieved 06/24/2014).

McGuire, James W. (2010): *Wealth, health, and democracy in East Asia and Latin America*. New York, NY: Cambridge University Press.

McGuire, James W. (2013): “Political regime and social performance.” *Contemporary Politics* 19(1): 55-75.

Mulligan, Casey B. / Gil, Ricard / Sala-i-Martin, Xavier (2004): “Do Democracies Have Different Public Policies than Nondemocracies?” *Journal of Economic Perspectives* 18(1): 51-74.

Muralidharan, Karthik / Sundararaman, Venkatesh (2011): “Teacher performance pay: Experimental evidence from India.” *Journal of Political Economy* 119(1): 39-77.

Muralidharan, Karthik / Sundararaman, Venkatesh (2013): “The Aggregate Effect of School Choice: Evidence from a two-stage experiment in India.” *NBER Discussion Paper* No. 19441. Cambridge, MA: National Bureau of Economic Research.

- Murray, Christopher J. L. / López, Alan D. (eds.) (1996): *The Global Burden of Disease: A Comprehensive Assessment of Mortality and Disability from Disease, Injury, and Risk Factors in 1990 and Projected to 2010*. Global Burden of Disease and Injury Series, vol. 1. Cambridge, MA: Harvard School of Public Health.
- Neumayer, Eric (2004): "Does the 'Resource Curse' hold for Growth in Genuine Income as Well?" *World Development* 32(10): 1627-1640.
- Nelson, Joan M. (2007): "Elections, Democracy, and Social Services." *Studies in Comparative International Development* 41(4): 79-97.
- OECD (2007): "What are the Incentives to Invest in Education?" Available at: <http://www.oecd.org/education/skills-beyond-school/48630822.pdf> (retrieved 03/08/2015).
- Olken, Benjamin / Onishi, Junko / Wong, Susan (2014): "Should Aid Reward Performance? Evidence from a field experiment on health and education in Indonesia." *American Economic Journal: Applied Economics* 6(4): 1-34
- Papayrakis, Elissaios / Gerlagh, Reyer (2004): "The resource curse hypothesis and its transmission channels." *Journal of Comparative Economics* 32(1): 181-193.
- Peabody, John W. / Shimkhada, Riti / Quimbo Stella / Solon, Orville / Javier, Xylee / McCulloch, Charles (2014): "The impact of performance incentives on child health outcomes: results from a cluster randomized controlled trial in the Philippines." *Health Policy and Planning* 29(5): 615-621.
- PISA (2012): *Programme for International Student Assessment: The PISA International Database*. Available at <http://pisa2012.acer.edu.au> (retrieved 02/23/2015).
- Pradhan, Menno / Suryadarma, Daniel / Beatty, Amanda / Wong, Maisy / Alishjabana, Armida / Gaduh, Arya / Artha, Rima P. (2011): "Improving Educational Quality through Enhancing Community Participation: Results from a Randomized Field Experiment in Indonesia." Washington, DC: World Bank.
- Prettitore, Paul (2012): "Who Needs Legal Aid Services? Addressing Demand in Jordan." *MENA Knowledge and Learning Quick Notes Series* 62. Available at <https://openknowledge.worldbank.org/bitstream/handle/10986/10845/682700BRI0Box367908B00PUBLIC00QN62.pdf?sequence=1> (retrieved 11/26/2014).
- Pritchett, Lant / Summers, Lawrence (1996): "Wealthier is Healthier." *Journal of Human Resources* 31(4): 841-868.
- PRS Group (2013): *International Country Risk Guide*. Available at <https://epub.prsgroup.com/products/icrg> (retrieved 11/24/2014).

Przeworski, Adam / Alvarez, Michael / Cheibub, José Antonio / Limongi, Fernando (2000): *Democracy and Development: Political Institutions and Well-Being in the World, 1950-1990*. Cambridge, UK: Cambridge University Press.

Qatar Supreme Education Council (2012): *Schools and Schooling in Qatar 2011-2012*. Available at <http://www.sec.gov.qa/Statistical%20Report/2011-2012.pdf> (retrieved 11/19/2014).

Ramsay, Kristopher W. (2011): "Revisiting the Resource Curse: Natural Disasters, the Price of Oil, and Democracy." *International Organization* 65(3): 507-529.

Rehm, Philipp (2005): "Citizen Support for the Welfare State: Determinants of Preferences for Income Redistribution." *SP II* 2005-2. Berlin, Germany: Social Science Research Center.

Rodríguez, Francisco / Sachs, Jeffrey D. (1999): "Why Do Resource-Abundant Economies Grow More Slowly?" *Journal of Economic Growth* 4(3): 277-303.

Ross, Michael L. (2001): "Does Oil Hinder Democracy?" *World Politics* 53(3): 325-361.

Ross, Michael L. (2006): "Is Democracy Good for the Poor?" *American Journal of Political Science* 50(4): 860-874.

Ross, Michael L. (2008): "Oil, Islam, and Women." *American Political Science Review* 102(1): 107-123.

Ross, Michael L. (2013): *Oil and Gas Data, 1932-2011*. Available at http://thedata.harvard.edu/dvn/dv/mlross/faces/study/StudyPage.xhtml?globalId=hdl:1902.1/20369&studyListingIndex=2_23378706a2b90e7c5e2339057c1d (retrieved 08/10/2014).

Ruppert Bulmer, Elizabeth (2000): "Rationalizing Public Sector Employment in the MENA Region." *Middle East and North Africa Working Paper Series* 19. Washington, DC: World Bank.

Sachs, Jeffrey D. / Warner, Andre M. (2001): "The curse of natural resources" *European Economic Review* 45(4-6): 827-838.

Scheve, Kenneth / Stasavage, David (2006): "Religion and Preferences for Social Insurance." *Quarterly Journal of Political Science* 1(3): 255-286

Sénéchal, M. (2006): "The Effect of Family Literacy Interventions On Children's Acquisition of Reading From Kindergarten to Grade 3." *National Center for Family Literacy*.

Smith, Benjamin (2004): "Oil Wealth and Regime Survival in the Developing World, 1960-1999." *American Journal of Political Science* 48(2): 232-246.

Stasavage, David (2005): "Democracy and Education Spending in Africa." *American Journal of Political Science*, 49(2): 343-358

Stokes, Susan C. (2005): "Perverse Accountability: A Formal Model of Machine Politics with Evidence from Argentina." *American Political Science Review* 99(3): 315-324.

Stokes, Susan C. / Dunning, Thad / Nazareno, Marcelo / Brusco, Valeria (2013): *Brokers, Voters, and Clientelism: The Puzzle of Distributive Politics*. New York, NY: Cambridge University Press.

Svolik, Milan W. (2012): *The Politics of Authoritarian Rule*. Cambridge, UK: Cambridge University Press.

Syria Needs Analysis Project (2013): "Lebanon Baseline Information. 10 October 2013" Available at <http://data.unhcr.org/syrianrefugees/partner.php?OrgId=135> (retrieved 03/03/2015).

TIMSS (2011): *Trends in Mathematics and Science Study 2011: International Database*. Available at <http://timssandpirils.bc.edu/timss2011/international-database.html> (retrieved 08/10/2014).

Tsui, Kevin K. (2010): "More oil, less democracy: Evidence from worldwide crude oil discoveries." *The Economic Journal* 121(551): 89-115.

Ulfelder, Jay (2007): "Natural-Resource Wealth and the Survival of Autocracy." *Comparative Political Studies* 40(8): 995-1018.

UNHCR (2014): "Background Note on Gender Equality, Nationality Laws and Statelessness 2014." Available at <http://www.unhcr.org/4f5886306.pdf> (retrieved 10/19/2015).

US State Department (2014): "2014 Investment Climate Statement – Saudi Arabia."

Van den Bosch, Marie A. (2012): "Natural Resources, Economic Performance and the Politics of Public Finance in Rentier States." Unpublished manuscript. Princeton, NJ: Princeton University. Available at https://www.princeton.edu/politics/graduate/courses/seminars/comparative-politics-semi/MAvdB_POL591Paper_MAY4.pdf (retrieved 03/15/2015).

Wade, Robert (1990): *Governing the Market: Theory and the Role of Government in East Asian Industrialization*. Princeton, NJ: Princeton University Press.

Wagner, Karl-Heinz / Brath, Helmut (2012): "A global view on the development of non communicable diseases." *Preventive medicine* 54: S38-S41.

Waldner, David / Smith, Benjamin (2014): "Rentier States and State Transformations." In *Oxford Handbook on Transformation of the State*, edited by Stephan Leibfried, Evelyne Huber, Matthew Lange, Jonah D. Levy, Frank Nullmeier, and John D. Stephens. Oxford, UK: Oxford University Press.

WHO (2013): *WHO methods and data sources for global burden of disease estimates*. Geneva: World Health Organization. Available at http://www.who.int/healthinfo/statistics/GlobalDALYmethods_2000_2011.pdf?ua=1 (retrieved 11/22/2014).

WHO (2014a): “Burden of disease estimates.” Available at <http://apps.who.int/gho/data/node.main.BURDENOFDISEASE?lang=en> (retrieved 08/10/2014).

WHO (2014b): “Global Health Observatory (GHO) Data repository.” Available at <http://www.who.int/gho/database/en/> (retrieved 11/19/2014).

Wigley, Simon / Akkoyunlu-Wigley, Arzu (2011): “The Impact of Regime Type on Health: Does Redistribution Explain Everything?” *World Politics* 63(4): 647-677.

World Bank (1998): *Education in the Middle East & North Africa: A Strategy Towards Learning for Development*. Washington, DC: World Bank.

World Bank (2004): *World Development Report 2004: Making Services Work for Poor People*. Washington, DC: World Bank.

World Bank (2013): *Jobs for Shared Prosperity: Time for Action in the Middle East and North Africa*. Washington, DC: World Bank.

World Bank (2014a): “Worldwide Governance Indicators.” Available at www.govindicators.org (retrieved 07/30/2014).

World Bank (2014b): “World Development Indicators.” Available at <http://data.worldbank.org/> (retrieved 08/10/2014).

World Economic Forum (WEF) (2014): “Global Competitiveness Report 2014-2015. Data downloads.” Available at <http://reports.weforum.org/global-competitiveness-report-2014-2015/downloads/> (retrieved 07/13/2015)