The Emperor Has No Clothes: The Limits of OPEC in the Global Oil Market

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Most scholars and policymakers believe OPEC can and does influence the price of oil by acting as a cartel. This paper argues that most of the conventional wisdom about OPEC is wrong. OPEC rarely if ever influences the oil production rate in its member states. Further, OPEC has almost no lasting impact on world prices, except under rare conditions. There was one occasion on which OPEC did have a significant impact on world oil prices, namely the 1973 oil crisis, but OPEC’s role in the event has been greatly misunderstood. The circumstances of the crisis were highly exceptional, making it unlikely that the organization could ever have a similar impact on world oil prices again.

This paper seeks to correct the misunderstanding about OPEC’s role, and replace it with a better understanding of the organization. I argue that OPEC is dysfunctional as a cartel, as it has little or no causal impact on its members’ choices about production levels or investment in production capacity. OPEC’s role is obscured in part by the complexity of the world oil market, and in part by misdirection by policymakers, especially within OPEC. Many scholars, especially economists, have argued that OPEC should be understood as a cartel designed to solve a Prisoner’s Dilemma (PD) coordination game. Yet OPEC’s persistence is better understood as a widespread failure to update beliefs about the organization, a failure that is driven by information asymmetry and politics. The fact that such a widespread belief about the world’s most important commodity market could be wrong can help us better understand international regimes.

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The Emperor Has No Clothes: The Limits of OPEC in the Global Oil Market

Most scholars and policymakers believe OPEC to be a powerful institution which can and does influence the global price of oil. According to this view, OPEC operates as a cartel, manipulating the price of oil principally by restricting supply. In doing so, OPEC generates huge excess profits for its member states. Since oil is a vital commodity in the modern economy, oil-importing states must constantly monitor OPEC as an organization, and be wary of the power that it wields.

Most of the conventional wisdom about OPEC is wrong. OPEC does not operate effectively as a cartel. It rarely if ever influences the oil production rate in its member states. And OPEC has almost no lasting impact on world prices, except under very rare conditions. In reality, the price of oil is largely set by market fundamentals like the rate of investment in production capacity, the impact of major wars, and the growth of demand, which has been especially strong in Asia in recent years. It is possible that speculators also play a role in creating short-term price bubbles. But at least since OPEC first began to operate as a formal cartel in 1982, its role in affecting world oil prices as a cartel has been minimal.

There was one occasion on which OPEC did have a significant impact on world oil prices, namely the 1973 oil crisis. Yet OPEC’s role in the crisis has been greatly misunderstood. The circumstances of the crisis were highly exceptional, making it unlikely that the organization could ever have a similar impact on world oil prices again. While OPEC did take actions that contributed to the dramatic increase in world oil prices in 1973, those actions had little to do with restricting oil supply. In fact, OPEC production hardly declined at all. The 1973 oil crisis had multiple causes, but probably the most important was the decision by OPEC to dramatically increase the “posted price” of its oil, thereby raising the tax and royalty payments that the major international oil companies had to pay OPEC governments. As I explain below, such posted prices no longer exist (taxes are now typically indexed to market prices), meaning that OPEC could not raise prices in this way again. The popular and scholarly misunderstanding
of the events of 1973 is consequential, as it has endowed OPEC with an almost mythical status as a manipulator of world oil markets.

This paper seeks to correct that misunderstanding, and replace it with a better appreciation of why OPEC exists. I argue that OPEC is dysfunctional as a cartel, as it has little or no causal impact on its members’ choices about production levels or investment in production capacity. I make no claim about whether OPEC could affect its members’ oil production; I simply argue that it does not do so in practice. I show that cheating in OPEC – i.e., oil production by member states in excess of their stipulated market allocations – is endemic: its nine core members cheat on their aggregate quota 96 percent of the time. Perhaps even more significantly, the quotas themselves often appear to be post-hoc justifications of production decisions made by individual states. This paper is not the first to highlight the problem of cheating or to question OPEC’s effectiveness.¹ Still, no other analysis demonstrates the emperor truly has no clothes. Using a variety of quantitative analyses of OPEC quotas and production, including a cross-national time-series regression of oil depletion rates, I show that OPEC membership is not correlated with lower oil production once other relevant factors are controlled for. As a whole, there is no evidence to suggest that OPEC exerts a significant influence on its members’ oil production policies.

If OPEC does not operate as a cartel, why do so many people believe that it does? OPEC’s role is obscured in part by the complexity of the world oil market, and in part by misdirection by knowledgeable actors, especially within OPEC. For OPEC leaders, the perceived market power of the organization is a useful fiction that generates political benefits with domestic and international audiences. Consequently, policymakers within OPEC have no incentive to undermine the idea that OPEC controls world oil prices. This does not necessarily mean that they are actively lying, but rather that they have an incentive to behave in ways that are consistent with the belief that OPEC is effective as a cartel, so long as that behavior is not too costly. Furthermore, business executives and politicians in

¹ Goldthau and Witte, 2011; Victor, 2008; Moran, 1987
non-OPEC members sometimes find OPEC a useful scapegoat to blame for high oil prices. This creates a situation characterized by the old phrase, ‘those that know don’t tell, and those who tell don’t know.’

An implication of my argument is that the story of OPEC is mostly about politics, not economics. The fact that such a widespread belief about the world’s most important commodity market could be wrong can help us better understand international regimes. Many scholars, especially economists, have argued that OPEC should be understood as a cartel designed to solve a Prisoner’s Dilemma (PD) coordination game. Yet as political scientists have pointed out, international regimes often serve other functions rather than solve PD problems. OPEC’s persistence is better understood as a widespread failure to update beliefs about the organization. The mistaken beliefs are perpetuated by three key factors: (i) a slow learning process, (ii) information asymmetry, and (iii) a narrative that is incorrect but politically useful for knowledgeable actors. As others have shown, OPEC is not the first international regime to outlive its original mandate.

This paper proceeds as follows. The first section reviews and critiques the existing literature on the role and impact of OPEC on world oil markets. The next section presents the core analysis of what role, if any, OPEC has as a coordinating mechanism for manipulating world oil prices. I find no evidence that OPEC has systematically suppressed oil supply since 1980, compared to the counterfactual in which OPEC did not exist and states simply pursued their own self-interest. The third section then reviews how OPEC influenced oil prices in the early 1970s, but not in the way most people believe. The fourth section turns to explaining the persistence of OPEC as an organization, given that it is not acting as an effective cartel. A short final section summarizes and concludes.

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2 By “most important commodity market,” I mean that oil is the single most valuable commodity traded across international borders, measured by the dollar value of the total market. Some other commodities (like diamonds and gold) are clearly more valuable on a per-unit basis.

3 Snidal, 1985

4 Barnett and Finnemore, 1999; Bernholz, 2009; Gray, 2011
Literature

The conventional wisdom among scholars and policymakers is that OPEC is a powerful market actor and has the capability to significantly influence world oil prices, even if it cannot control them perfectly. Further, most people believe that OPEC does this by way of operating as a cartel does, by consciously producing less oil than it could to drive up its price.\(^5\) Reflecting this conventional wisdom, one economist writes, “OPEC is obviously a cartel that restricts output in order to obtain super-competitive profits and must be concerned with the incentives each of its members has to overproduce.”\(^6\) This view is widely shared.\(^7\)

The extent of OPEC’s impact is hidden by the complexity of the world oil market and the lack of transparency about underlying causes of market prices. Some people observe that the production cost of oil in OPEC countries is considerably lower than the market price, and conclude that since OPEC does not increase its oil production until marginal cost equals marginal revenue, it must be a cartel. Yet this is not necessarily the case: low production rates in some countries could be better explained by other factors, such as the individual preferences of certain oil-rich countries, or production constraints due to the poor business climate common among many oil-producing states. Indeed unequal marginal production costs around the world are a characteristic of many industries, not just the oil industry. Moreover, even if it is the case that individual members of OPEC, such as Saudi Arabia, face economic incentives to restrict production in order to increase the average cost of oil, that does not make OPEC a

\(^5\) A cartel is defined as a group of firms (or states, in this case) that creates agreements about quantities to produce or prices to charge. “A cartel must not only agree on the total level of production but also on the amount produced by each member.” Mankiw, 2011: 351

\(^6\) Hyndman, 2008: 812

\(^7\) Adelman, 1995; Alt et al., 1988; Bentzen, 2007; Blaydes, 2004; Claes, 2001; Doran, 1980; Krasner, 1974; Kaufmann et al., 2004, 2008; Ikenberry, 1988; Osborne, 1976; Seymour, 1980; Shaffer, 2009; Smith, 2008, 2009; Sovacool, 2011. Even skeptical analyses, such as Barsky and Kilian 2004 or Moran 1987, do not dispute OPEC’s status as a cartel.
cartel. To be properly considered a cartel, it must be the case that OPEC membership causes states to adopt different market behavior than they otherwise would.  

Perhaps surprisingly, those who have investigated the effectiveness of OPEC as a cartel have had difficulty finding conclusive evidence. Alhajji and Huettner find that neither OPEC nor the OPEC core can be characterized as a dominant producer in the world crude oil market, 1973-1994. Kohl argues that OPEC’s efforts to manipulate prices have been undermined by political events. Smith finds that “OPEC is much more than a non-cooperative oligopoly, but less than a frictionless cartel (i.e., multi-plant monopoly).” Furthermore, Smith’s analysis relies on rather indirect evidence of cooperative behavior. Gulen finds that OPEC was effective only in the period from 1982 to 1993. (This finding is surprising because the price of oil sharply fell from 1982 to 1986, which hardly indicates the strength of the cartel.) Overall, there is little direct evidence that OPEC actually influences world oil prices or operates as an effective cartel.

Even if OPEC has little impact on the fundamentals of the oil market, it can still have a short-term impact on oil prices based purely on perceptions. Thus it is perhaps not surprising that the best evidence that OPEC can effectively move the price of oil comes from investigations of OPEC announcements and public statements, rather than the actual production behavior of its members. For instance, Hyndman finds that OPEC announcements have an (asymmetric) ability to move spot prices for 15 to 20 days, but he offers no evidence that OPEC is actually restricting output. Similarly, Demirer and Kutan argue that it is OPEC announcements that affect oil prices, at least within certain periods of

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8 See note 5.  
9 Alhajji and Huettner, 2000. (The “OPEC core” is a subset of OPEC member states which are especially oil-rich, including Saudi Arabia.)  
10 Kohl, 2002  
11 Smith, 2005: 74  
12 Gulen, 1996  
13 Hyndman, 2008
What is striking about these findings is that it is plausible that OPEC announcements have an impact on oil prices entirely because of perceptions: the markets believe OPEC matters, and thus it does, at least in the short-term. Perceptions matter. Yet announcements can have at most a short-term impact if they do not represent genuine facts about the underlying supply and demand. Evidence of a more fundamental link between prices and OPEC behavior, i.e., its oil production, is remarkably elusive.

Despite this lack of evidence, many scholars continue to assume that OPEC cartel profits exist. For instance, Blaydes argues that there is an intra-OPEC bargaining game to divide the cartel’s profits.\(^\text{15}\) In brief, she argues that oil-rich states “subsidize” oil-poor states by allowing oil-poor states to cheat on their OPEC quotas to a greater extent than the oil-rich ones do. Yet Blaydes provides no evidence of cartel profits. Empirically, she studies only the behavior of the OPEC members, and does not compare them to non-OPEC members, so it is not possible to assess how either the oil-rich or oil-poor OPEC states’ production behavior differs from other states.

Consequently, there is a need to have a fresh look at the evidence. As Downs, Rocke and Barsoom have argued, states are reluctant to make international agreements that require costly adjustments to their behavior.\(^\text{16}\) This suggests that OPEC quotas might not actually require states to deviate significantly from their counterfactual behavior in which no quotas existed. And to the extent that they do, OPEC members have strong incentives to cheat on their quotas by over-producing (since producing more oil brings in more revenues).\(^\text{17}\) OPEC has no direct way of enforcing its agreements, other than by persuasion or rather blunt, indirect methods (such as when Saudi Arabia abandoned its role as swing producer for OPEC in 1985-86, thereby decreasing the price of oil and hurting its fellow OPEC members). The effect of all of this cheating has never been fully quantified and analyzed in a rigorous way. Thus a new examination of OPEC’s role in the world market for oil is needed.

\(^{14}\) Demirer and Kutan, 2006
\(^{15}\) Blaydes, 2004
\(^{16}\) Downs et al, 1996
\(^{17}\) Goldthau and Witte, 2011; Moran, 1987; Smith, 2009; Victor, 2008
OPEC as market manipulator?

In this section, I argue that since OPEC first began to assign quotas (also known as “market allocations”) to its member countries in 1982, it has not had any significant impact on its members’ production levels, and thus does not act as a cartel to control world oil prices. Later I address the 1970s, which is a partial exception to my overall argument.

OPEC on the World Stage

OPEC was created in 1960 and currently (2011) has twelve member states: Algeria, Angola, Ecuador, Iran, Iraq, Kuwait, Libya, Nigeria, Qatar, Saudi Arabia, the UAE, and Venezuela. Indonesia and Gabon were previously members. Each member state has a relatively small portion of the global market; even the largest producer, Saudi Arabia, produces just 12 percent of the world total of about 80 million barrels per day (bpd). Collectively, OPEC produced 41 percent of the world total in 2009. This is lower than the market share OPEC enjoyed in the 1970s (OPEC accounted for 51 percent of world production in 1973), but it is still considerable.\(^{18}\) If OPEC were able to cooperate flawlessly, it is plausible that it could exert significant influence on the price of oil.

The organization meets regularly and makes decisions by consensus. It can set or change its members’ quotas for oil production at any of its regular meetings, or it can do so in an ‘extraordinary session.’ Since decisions are made by consensus, each state effectively wields a veto. Each member state appoints a delegate to represent it at OPEC meetings, typically the Minister of Oil or its equivalent.

Goldthau and Witte identify three key factors that shape the effectiveness of OPEC (or any other international cartel): the number of market participants (i.e., oil producers), the transparency of the market, and the existence and effectiveness of the cartel’s enforcement rules. Unfortunately, none of

\(^{18}\) BP Statistical Review of World Energy, 2010
these factors bodes well for OPEC. There are scores of oil producing firms, spread over almost fifty oil-producing countries. The oil market is quite opaque, with major oil producing countries often reluctant to provide detailed information about important quantities like oil reserves. And perhaps worst of all, OPEC has no real enforcement mechanism. This leaves the actual impact of OPEC on world oil prices in some doubt.

*Does OPEC manipulate prices by changing its production quotas?*

To identify OPEC’s market impact, let us start by considering the relationship between OPEC quotas and world oil prices. Given that OPEC is often believed to manipulate prices by setting its quotas so as to restrict oil production and thereby drive up oil prices, one might expect to see a correlation between the total OPEC production target (*i.e.*, the sum of its quotas) and the world price of oil. Figure 1 illustrates the relationship between the two variables over the period 1982-2009. As can be easily seen, there is no strong correlation between the two variables. In a simple bivariate OLS regression between prices and OPEC quotas provides an R-squared value of just 0.15, indicating that these variables are quite weakly correlated.

[Insert Figure 1]

Unfortunately, this tells us very little about the market impact of OPEC. The difficulty here is that any potential causality between the variables runs in both directions: OPEC quotas might be set low when prices are low to try to raise prices, but then if the move is successful at least some of the time, the price will rise, and low OPEC quotas would be correlated with high prices. The core problem here is that we do not know the counterfactual: what prices would be if OPEC did not set quotas. Consequently, even with the lack of correlation between OPEC quotas and world oil prices, it is plausible to believe (as many do) that prices would be significantly lower if the OPEC quotas were not present.
But note that it is equally reasonable to infer that OPEC quotas are having no impact at all. On its own, the (lack of) correlation between OPEC quotas and oil prices does not give us enough information to make valid inferences. About the only useful thing we can infer is that there clearly are other determinants of the price of oil besides OPEC quotas, such as wars (e.g., the Iraq-Kuwait war in 1991, which created a price spike) or shifts in demand (e.g., Asian economic growth).

Still, if OPEC is manipulating the price of oil as most people believe, it must be the case that OPEC production depends strongly on OPEC quotas. The evidence to support that claim is very weak, for four reasons. First, OPEC’s quota system is patchy at best. Iraq has not had a quota since 1998, and other members have also periodically gone without assigned quotas. In addition, the organization occasionally fails to set a production target for the organization as a whole (e.g., for several periods after the Iraqi invasion in Aug 1990) or sets an overall OPEC quota without specifying individual quotas for its members (e.g., 2006-2007), thereby rendering it rather unclear how its members will reach that target.

Second, the problem of cheating by OPEC members is endemic. Over the period 1982-2009, the organization as a whole over-produced a staggering 96 percent of the time. I use monthly production data, drawing on data from the US Energy Information Agency. Table 1 shows the variation among OPEC members. All but two members over-produced in more than 80 percent of the months during this period. The exceptions were Iran and Venezuela, which still cheated over 70 percent of the time. The magnitude of over-production varies over time and from country to country, but it is not trivial: on

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19 Iran, for instance, did not have a quota for a period in 2000. Also, Ecuador suspended its membership for over a decade, during which time it did not have a quota.
21 Note that the EIA’s production data can differ from the OPEC production data, especially for certain countries (e.g., Algeria). I do not use the OPEC production data because it is self-reported by member countries, and is not fully credible, as member countries have an incentive to dissimulate when they are overproducing.
average, the nine principal members of OPEC produced 10 percent more oil than their quotas allowed.\textsuperscript{22} In 2009, the excess production was more than 5 million barrels per day on average, equivalent to more than the output of Iraq and Kuwait combined. Even on the relatively rare occasions when member countries are not over-producing, the root cause is often involuntary production constraints such as a strike or accident, rather than a conscious decision by the government to obey to its OPEC quota.

[Insert Table 1]

One possibility is that the OPEC anticipates a certain amount of cheating and sets the quotas accordingly, in the same way that governments set highway speed-limits knowing that drivers will regularly exceed it by some amount. Even if this is true, however, it would require that OPEC production rates are lower than the counterfactual in which no quotas were set. I test this possibility in detail below.

Third, OPEC quotas do a poor job of accounting for statistical variation in production levels. Table 1 also shows the R-squared value of a linear bivariate time-series regression between changes in an OPEC member’s production and changes in its quota.\textsuperscript{23} For all but two of the states (Libya and Algeria), changes in the OPEC quota are not found to be correlated with production at standard thresholds of statistically significance. The R-squared for the nine major OPEC producers as a group was just 0.018, meaning that at most 1.8 percent of the variation in the month-to-month changes in this group’s oil production can be explained by their OPEC quotas. In other words, at least 98 percent of the variation is explained by factors other than their OPEC quotas.

\textsuperscript{22} The nine members are: Algeria, Iran, Kuwait, Libya, Nigeria, Qatar, Saudi Arabia, UAE, and Venezuela. Calculated using data from the U.S. EIA for actual production, and from OPEC for market allocations, 1982-2009. Note that Smith (2008) estimates that overproduction averages just 4 percent using ostensibly the same data (though for a different time period). It is unclear how he arrives at this estimate.

\textsuperscript{23} Formally, the dependent variable is the first difference in oil production, and the independent variable is the first difference in oil quota. The observations are monthly, although the values are measured in barrels per day.
Fourth, correlation is not causation: it is not at all clear whether OPEC production is being set in response to quotas, or vice versa. One way to interpret the (very weak) correlation observed in Table 1 is that states’ oil production moves in response to changes to OPEC quotas. Yet it is also quite possible that such changes would have occurred even in the absence of OPEC quotas. Further, the causality could be reversed: quotas might be moved in order to reflect the reality of production changes that members were already taking or had taken. Indeed there is some evidence that OPEC quotas lag rather than lead production. For instance, there were 22 OPEC meetings 1982-2009 in which quotas were increased. In 21 cases, the new aggregate quota for the nine principal OPEC members was lower than the amount that the same countries were producing in the month prior to the change; only once did the increased OPEC quota actually allow for increased production. One quite plausible interpretation of this pattern is that OPEC quotas are simply being adjusted to reflect a reality that already exists.

For all these reasons, there is very little evidence to suggest that OPEC is manipulating oil prices through its production quota system. OPEC quotas are irregularly applied, frequently ignored by its members, and have at most a very modest effect on actual production.

Even in the face of this evidence, one could still believe that OPEC is influencing the market price of oil if one accepts at least one of two propositions. First, one could argue that even though OPEC’s quotas are only a loose guide to its real production levels, it is possible that the oil market continuously anticipates OPEC’s movements, and OPEC anticipates the market, in ways that are hard to measure but nonetheless increase the price of oil relative to the counterfactual (i.e., that OPEC did not exist). For instance, perhaps OPEC members change production levels in between OPEC meetings because they anticipate forthcoming changes in the quotas. Second, one could argue that even if OPEC’s quota system is entirely meaningless, OPEC still raises world oil prices over the long-term because it encourages the adoption of a slow depletion policy, thus ensuring that member states produce less oil.

\[24\] Parra, 2004: 321-322
than they would otherwise. (Depletion policy refers to a set of decisions about how fast to pump the oil out of the ground.)

Perhaps the most sophisticated argument that OPEC increases oil prices is made by Smith, based on the second of these two propositions. Smith argues that OPEC has two major strategies for affecting prices: 1) extracting less oil than existing wells can produce; and 2) restricting the growth of new capacity by limiting the effort to find and develop new resources. OPEC’s quota system is driven by the first strategy, and Smith acknowledges that it has largely been a failure. Yet he argues that the second strategy has been more successful. As evidence, he points out that OPEC’s “crude oil production capacity (34 million barrels per day) is virtually unchanged from 1973, although the volume of its proved reserves—that is, known deposits that could have been tapped to expand capacity—doubled over that span.” By contrast, non-OPEC producers have greatly expanded their production capacity, even though they mostly operate in less prolific and more expensive oil fields.

Both of these propositions have a clear empirical implication: the oil depletion rate of OPEC member states ought to be significantly less than the depletion rate of comparable non-OPEC members. If that difference in depletion rate exists, it would have the effect of lowering world oil supply and thus increasing world oil prices, just as the conventional wisdom expects. And crucially, this is an empirical implication that can be tested relatively easily, as it does not face the same problems of reverse causality that plague the inquiries into relationship between oil prices and OPEC production levels.

*Does OPEC affect prices by encouraging a slow depletion rate?*

A country’s depletion rate is equal to its oil production divided by its proven oil reserves. If geology was all that mattered, we might expect that every oil-producing country would have about the

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25 Smith, 2009
26 Smith, 2009: 152-153. Note that according to the *BP Statistical Review of World Energy*, OPEC’s 1973 oil production was 30.8 million barrels per day (bpd).
same depletion rate. Yet nothing could be further from the truth; depletion rates vary widely around the world. For instance, the US had an average depletion rate of almost 10 percent per year over the period 1980-2005, whereas Saudi Arabia depleted at about 1.3 percent per year and Kuwait under 1 percent.27 The global average depletion rate was about 5.8 percent. Note that depletion rates should be understood carefully, and do not provide simple predictions about when a state will “run out” of oil, as the estimate of proven reserves is constantly being updated (as new discoveries are made and technology allows more oil to be recovered from existing wells).

What explains the cross-national variation in depletion rates? Broadly speaking, depletion rates will vary according to three main factors: the business climate of the producing country; the “lift costs” of oil production (including exploration and development), and the government’s depletion policy. Many factors will be important for the business climate of the producing country, such as: whether the country is at war (which can lower production, unsurprisingly); the technical competence of the oil companies operating the field (which often depends on whether it is a local or foreign firm); whether the political regime has set up an efficient investment climate (autocracies especially can create significant investment risks and inefficiencies); and whether the state is targeted by international economic sanctions (which can hurt both investment and export sales). The lift cost of oil production also clearly matters, as we should expect that depletion rates will be higher in places where lift costs are low, all else equal, as it is more profitable to produce oil in such areas.

Finally, the state’s depletion policy matters. OPEC membership could affect depletion policy, but so could many other factors, such as the state’s fiscal needs, the incentives generated by its position in the global market (as a dominant firm or price-taker), and the time horizons of the political leadership. To capture these other factors, I consider the state’s market position with regard to oil production. States with large oil reserves can be considered as analogous to dominant firms in

27 Data for production and reserves comes from the *BP Statistical Review of World Energy*. 
microeconomics: they have incentives to under-produce the quantity of their product in order to increase price and maximize profit. Monopolists are an extreme case of market dominance. Note that dominant firms can under-produce (relative to a perfectly competitive market) even without coordinating with each other or acting as a cartel: they have incentives to do it simply in their own individual interest. Additionally, states with large oil reserves per capita are oil-rich, meaning that the fiscal demands of the government can typically be met without maximizing production. Such oil-rich states tend to view their oil as a national patrimony to be used carefully and guarded from foreign business interests, thus giving them long time horizons about optimal depletion policy.

With these considerations in mind, I investigate the variation in cross-national variation in depletion rates over a twenty-five year period, 1980-2004, based on data availability.\(^{28}\) OLS regression is used on the dependent variable, which is the depletion rate in each state-year. The models use Huber-White standard errors clustered by state, on the premise that standard errors for multiple observations within a state cannot be assumed to be independent of each other.

Several explanatory variables are used. The regression includes the variable \(OPEC\), a dichotomous measure indicating whether the state is a member of OPEC in a given year, which is of crucial interest to this inquiry. The second variable is \(market\) \(position\), measured by the natural log of oil reserves per capita. Data on oil production and oil reserves are from the BP \textit{Statistical Review of World Energy 2009}. Third, the state’s regime type is considered, as this could significantly affect the state’s depletion policy in a variety of ways, including its ability to obtain foreign investment in its oil sector.\(^{29}\) Regime type is measured using the Polity IV score, which range from -10 to +10. Fourth, the \textit{corruption} of political institutions and governance practices in each state affects the ease with which international businesses will operate in a particular state, and correspondingly could affect the extent to which they

\(^{28}\) BP \textit{Statistical Review of World Energy} provides annual data on oil production starting in 1965 (and earlier for some countries) but it provides estimates for proven reserves starting only in 1980.

\(^{29}\) Jensen 2006; Li, 2009; Jensen and Johnston, 2011
wish to invest in oil production capacity. *Corruption* is measured using the (inverse) Corruption Perception Index (CPI) created by Transparency International.\(^{30}\) The *corruption* variable inverts the CPI’s ten-point scale, such that higher scores indicate more corruption and less transparency. Fifth, a dichotomous variable, *war*, indicates those state-years in which a state was engaged in a major international war in its own territory, such as the Iran-Iraq or Iraq-Kuwait wars. Sixth, another dichotomous variable, *sanction*, indicates those state-years in which a state was the target of a major international sanction.\(^{31}\)

Table 2 presents the results of a regression analysis. Model 1 shows a simple bivariate model that indicates that OPEC membership is indeed statistically associated with low depletion rates, as traditionally expected. The statistical significance of OPEC membership disappears, however, when other variables are added, as in Model 2. The coefficient for *market position* is negative and significant, indicating that oil-rich states with strong market positions generally have low depletion rates, and oil-poor states generally have high depletion rates, regardless of whether they are members of OPEC. International *wars* also tend to depress depletion rates, as expected. The coefficient is negative for *sanctions*, and positive for *democracy*, as expected, but those coefficients are not statistically significant at standard confidence thresholds.

[Insert Table 2]

In Model 2, the coefficient for *OPEC* membership is cut to less than a quarter of its value compared to Model 1, and is no longer statistically significant.\(^{32}\) OPEC members produce oil at more or

\(^{30}\) Transparency International, 2008. [http://www.transparency.org/policy_research/surveys_indices/cpi](http://www.transparency.org/policy_research/surveys_indices/cpi) Data is missing for a number of years for several states. Since at least one data point exists for each state, missing data is interpolated by using the data available for that state that are closest in time.

\(^{31}\) Data for this variable is from Hufbauer et al., 2008.

\(^{32}\) This result should be interpreted carefully. Statistical analyses do not allow the analyst to affirm the null hypothesis if the coefficient is not statistically significant; “proving” the non-existence of a possible relationship is
less exactly the same rates that they could be expected to produce in the absence of OPEC. The findings imply that, to the extent that OPEC members under-produce compared to non-OPEC members, they do so for reasons that have nothing to do with their OPEC membership. Some OPEC members might restrict their depletion rate as a conscious act of policy (Saudi Arabia being the most plausible such case), but they appear to do so out of their own self-interest, acting like dominant firms to drive up the average price of their product. At least since 1980, there is no evidence of that OPEC as an organization has significant influence on oil production rates.

These findings run contrary to the popular perception that OPEC frequently manipulates the price of oil by under-producing and constricting supply. OPEC members that are oil-poor typically appear to be focused on turning their oil reserves into cash that can be used for other purposes: for economic development, for military purposes, or for the political leaders’ personal bank accounts. As such, they tend to produce oil at rates as fast or faster than comparable non-OPEC members. For instance, Indonesia and Ecuador often had depletion rates higher than the global average despite being members of a “cartel” with the nominal goal of restricting oil production. Other OPEC members, like Saudi Arabia and the other states surrounding the Persian Gulf, produced more slowly, but this is probably better explained by their market position, low fiscal needs, and business inefficiencies. In countries like Iran and Iraq, low depletion rates are also strongly influenced by the poor business climate in those states, which in turn is likely generated by factors such as managerial incompetence, wars, corruption, and political risk for investments. It is noteworthy that several non-OPEC members such as Azerbaijan, Mexico, Equatorial Guinea, and Kazakhstan have depletion rates that are as low or lower than most OPEC members, for much the same reason: a combination of poor business climates and (in the case of Equatorial Guinea and Kazakhstan) relatively high reserves per capita, suggesting low short-impossible. However, the convention in social science is that a significant statistical relationship is required to constitute positive evidence in support of a theory. That evidence is not present in this case.
term fiscal needs and longer time horizons. Thus, there is no evidence to suggest that OPEC exerts a significant influence on its members’ oil production policies.

One plausible interpretation of the results in Model 2 is that OPEC membership is epiphenomenonal to an underlying relationship between the size of a state’s oil reserves and its depletion rate. On this view, states with large oil reserves per capita are likely to join OPEC, and they are also likely to adopt a slow depletion rate. Yet OPEC itself is doing no causal work on the rate of depletion; the real causal driver is the size of the state’s oil reserves.

Models 3 and 4 introduce additional variables, but the same basic result holds. When the measure for corruption is added in Model 3, it takes on a negative and statistical significant coefficient, indicating that higher levels of corruption lead to lower production levels, as it drives up the costs of doing business. Also, the introduction of the corruption variable reduces the size of the coefficient on war considerably. Still, the market position variable remains significant above the 95% confidence level. In Model 4, I control for lift costs. Unfortunately, there is a lack of publicly-released, cross-national time-series data for measuring lift costs. As a proxy, the lift cost data for different countries can be estimated using data from a Goldman Sachs report on the largest 125 upstream development projects under development in 2006. Again, there is no material change from the results in Model 2.

One other striking feature of the market for oil is its remarkable resilience to the impact of international events such as wars and economic sanctions. Although there can be little doubt that wars do have impact in some circumstances (e.g., Kuwait in 1990), the evidence suggests that those disruptions occur only in the face of truly catastrophic violence and even then are quite short-lived. International sanctions, such as those placed on Angola, Libya, Syria, Sudan, and Iran, appear to have had very little impact on oil output (although Iraq for some but not all of the 1990s may be an exception to this trend). This does not necessarily indicate the ineffectiveness of economic sanctions, however.

\[ \text{Waghorn et al., 2006} \]
Often there were other goals of the sanctions besides restricting oil production, such as limiting the international travel of autocratic leaders or restricting weapons purchases. Additional work is needed to evaluate the true effectiveness of sanctions on oil-exporting states. Analytically this is challenging because, in a world of oil-thirsty customers, there are few cases where the explicit goal of the sanctions was to restrict oil-production.

Robustness checks

Depletion rates could be influenced by other factors. First, civil wars or even lower-level civil conflict could affect depletion rates. I investigate this by including the variables civil wars and civil conflict in the models, using data from the UCDP dataset, which defines civil wars (conflicts) as violent disputes having at least 1000 (25) battle deaths in a calendar year. Second, I control for the Cold War – measured using a dichotomous variable that equals 1 until 1990, and 0 afterwards – which could have altered the dynamics of the global oil market. When introduced into the regressions, neither of these variables materially change the results from Table 2. Third, I change the dependent variable to the state’s production rate (rather the depletion rate), and let the state’s oil reserves act as an independent variable. Again, the results are consistent with the findings from Table 2.

These results are also robust to known problems with the data on oil reserves. OPEC production quotas are linked to a country’s declared oil reserves: bigger reserves mean bigger quotas. Thus in the 1980s, it is widely suspected that some OPEC members began to overstate their reserves so that they would not face political heat when their production exceeded their quotas. As noted above, there is little evidence that OPEC actually changed their production behavior, but it may be that members were willing to fabricate some data in order to alleviate the political consequences of their actions. To account for this, OPEC members’ oil reserves as stated in 1980 were used for all years in a sensitivity

34 Gleditsch et al., 2002
analysis. Thus the changes (increases, in almost all cases) in the stated oil reserves of OPEC members since 1980 are ignored in this robustness check. Again, the results of the analysis do not change materially. Thus the findings reported above are robust to such data issues.

The poor data quality for lift costs is unfortunate, but it is unlikely to introduce a problematic bias into the analysis. To see why, consider the possibility that OPEC membership actually does decrease depletion rates, but this effect is masked because the lift costs are not introduced in some of the models in Table 2. We can safely assume that lift costs in OPEC are considerably lower than in non-OPEC areas, as the Persian Gulf oil is widely considered by the industry to be ‘easy oil,’ i.e., low cost of extraction. Given this fact, it would have to true that the underlying correlation between lift costs and depletion rates is positive in order to hide the hypothesized correlation between OPEC membership and low depletion rates. Yet this does not follow economic logic: lift costs should be negatively correlated with depletion rates, all else equal, because producers would make the most profits by extracting the most oil from where its lift costs are lowest. Thus even if perfect data were available for lift costs, there is no reason to expect that it would alter the analysis above.

**The Exception? The Role of OPEC in 1973**

There was one occasion on which OPEC did have a significant impact on world oil prices, in the 1973 oil crisis. Yet OPEC’s role in the crisis has been greatly misunderstood, and the circumstances of the crisis were highly exceptional, making it unlikely that the organization could ever have a similar impact on world oil prices again.

As with so much of the conventional wisdom about OPEC, the notion that OPEC raised the world’s oil prices in 1973 by restricting global oil supply is largely a myth. As discussed above, OPEC did not even begin to operate as a cartel by assigning production quotas to its members until 1982, well after the event. As for restricting supply, at an average of 30.9 million (bpd), OPEC’s 1973 output was
actually higher than its output in 1972 of 27.3 million bpd, and OPEC maintained that level (i.e., about 30 million bpd) through 1974. Some OPEC members did announce an embargo on oil sales to the United States, the Netherlands, and later other states, but this decreased their total oil output only at the margins; mostly, they simply switched customers. OPEC itself did not participate in the embargo, and many of its members (including Iraq, a vocal proponent of the embargo) continued to sell oil to all customers. Moreover, as I discuss below, there are several reasons why the actual impact of this embargo on oil prices is uncertain.

OPEC took three actions in 1973 that contributed to the increase in prices. First, and perhaps most importantly, OPEC members dramatically raised the posted prices of their oil. Posted prices and market prices were not the same thing. Posted prices set the nominal value of the oil extracted by the international oil companies (IOCs), and formed the basis for tax and royalty payments from the IOCs to the oil-producing states. Market prices were the prices that the IOCs actually received by selling the crude oil in the downstream market. In the late 1960s and early 1970s, a significant discrepancy grew between the posted prices and market prices, with the latter being significantly higher. This meant that the cost of oil production for the companies was lower than what it would have been if their tax and royalty payments were based on market prices. In 1973, OPEC members had had enough, and increased the posted prices to $11.65 per barrel, up from $2.90 per barrel earlier in the year and just

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35 BP Statistical Review of World Energy. See also below for estimates of the magnitude of the (brief) decline in OPEC output.
36 Moran (1987: 598) reports that total OPEC output declined by 7 percent. Even this modest amount seems too large in comparison to other data, e.g., the rates given by BP Statistical Review of World Energy (given in annual averages) or the data of the US Energy Information Agency (given in monthly averages). The BP data suggest that the impact of the embargo was too small to affect the annual average; the Energy Information Agency data suggest that the decline in the months Oct 1973-March 1974 was about 4 percent of the average in the previous year.
37 The embargo was actually declared by OAPEC, the Organization of Arab Petroleum Exporting Countries, not OPEC. See Bronson, 2006 and Yergin, 2008 for a history of the embargo.
38 Yergin, 2008; Parra, 2004
39 Moran, 1987
$1.80 in 1970. This greatly increased the tax payments of the IOCs, which in turn meant that market prices rose. Today, “posted prices” no longer exist, and the vast majority of oil production agreements are based on market prices.

Second, OPEC encouraged its member states to nationalize their oil industry. This led to a great wave of nationalizations, including Libya (1970), Algeria (1971-74), Iraq (1972), Venezuela (1974), Kuwait (1975-77), and Saudi Arabia (1973-1980). The wave of nationalization meant that the production decisions over much of the world’s oil reserves were no longer controlled by the ‘Seven Sisters,’ as the big Western IOCs were known. It is difficult to quantify precisely what effect this had on the price of oil, but it seems clear that it unsettled the market and amplified a market expectation that oil would be costly in the future.

Third, some OPEC members implemented a short-term embargo against the United States and others as part of the 1973 Arab-Israeli War. The embargo started in October 1973 and officially ended five months later. Yet even by the end of 1973, the Arab producers were beginning to relax the production restrictions. Moreover, recently declassified documents show that Saudi Arabia made secret oil shipments to the US military, to ensure that its operations in Vietnam would not be compromised. The actual impact of the embargo, in terms of the amount of oil actually delivered to the United States, is unclear and may have been quite small. This is because of the fungibility of the world market: since the Arab producers continued to sell into the world market, their oil shipments to other countries freed up oil supply from non-Arab producers that could be sold to the embargoed countries. This is exactly what happened: oil companies rerouted petroleum to offset the impact of the

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41 Sampson, 2009

42 Bronson, 2006; Yergin, 2008

43 Brown, 1999
embargo.\textsuperscript{44} This is not to say that the supply shift was seamless, as much of the world oil supply in 1973 was delivered by long-term contracts, and rerouting was not flawless. Still, on a global scale, the actual magnitude of the supply disruption was both temporary (a few months at most) and relatively small (about 4 percent of total OPEC output, or 2-4 percent of total world output).\textsuperscript{45}

Perhaps the biggest impact of the embargo was psychological. The embargo took place in the context of rising fears that the world was running out of oil, and the expectation that its cost would rise in the future. The US government exacerbated the effect of the embargo by imposing domestic price controls on gasoline, leading to shortages and long lines at retail gasoline stations.\textsuperscript{46} These shortages were a direct consequence of US domestic policy, not the embargo: if prices had been allowed to rise, the market would have cleared on its own, and possibly without nearly as much economic pain. The oil crisis also transformed global political relations and stripped the (mostly American) oil companies of their long-held ability to control the production of oil around the world.

Much has changed since 1973. Two of the three actions that OPEC took or encouraged in 1973 were unique. Posted prices no longer exist. The nationalization of the oil industry in most major producers has already happened. Only the third action taken by OPEC members, an embargo, could happen in today’s oil market, and in terms of affecting oil prices, it was probably the least important of the three actions. Moreover, oil-consuming countries have put in place a number of safeguards to mitigate the effect of such an embargo.\textsuperscript{47} All of the major oil-importing states have significant commercial and strategic petroleum reserves, of far greater quantities than existed in 1973. Further, in 1974, the International Energy Agency (IEA) was created with the express purpose of managing oil supply disruptions, and to coordinate releases from the petroleum reserves that all IEA members are required to maintain. Finally, long-term contracts mostly have been replaced, making the market more

\textsuperscript{44} Stobaugh, 1975
\textsuperscript{45} According to EIA data. See earlier note about the size of the oil disruption.
\textsuperscript{46} Kalt, 1981; Frech and Lee, 1987; Goldthau and Witte, 2011
\textsuperscript{47} Gholz and Press, 2010
flexible. This is not to say that an embargo could have no effect on oil prices at all, but that its effect in today’s oil market would be mitigated by these innovations. Perhaps not surprisingly, there has not been an international oil embargo since 1973 (as compared to three in the period 1956-1973).

Since 1973, there have been three major spikes in the price of oil, none of which were attributable to OPEC actions. The first took place in 1979-1980, and came about primarily because of the Iranian revolution and the Iran-Iraq war. The second happened in 1991, in the lead up to the Persian Gulf War, which ended very quickly. The third occurred in 2006-2008, as the result of rising Asian demand for oil and possibly exacerbated by market speculation. Given the nature of the market and the high price elasticity of oil, sudden shifts in global oil prices can and will happen again. Future shifts could even be caused by events in OPEC member countries, such as a disruptive civil war in Saudi Arabia. Yet the market power of OPEC as an organization is dubious. Without insisting that it is impossible, it is fair to say that OPEC is unlikely to ever again influence the price of oil as it did in 1973. It did so under some very special circumstances. Having done so, OPEC’s perceived power to influence world oil markets was raised to an almost mythical status. As I discuss in the next section, that suited the members of OPEC just fine.

Understanding OPEC’s persistence

A central implication of my argument is that the story of OPEC is mostly about politics, not economics. Many scholars, especially economists, have argued that OPEC should be understood as a cartel designed to solve a Prisoner’s Dilemma (PD) coordination game. The fact that the original creators of OPEC hoped that it would act as a cartel, and that OPEC portrayed itself as a cartel, furthered this perception in the 1970s. Steven Krasner, a political scientist, even argued in a 1974 article that “Oil

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48 Smith, 2009; Yergin, 2008
49 Hamilton, 2009
50 Osborne, 1976; Smith, 2005; Hyndman, 2008
is the exception,” with characteristics that made it particularly susceptible to an international cartel in a way that other commodities were not. Yet the analysis above suggests that OPEC does not actually function as a cartel.

OPEC’s persistence as an organization is better understood as a widespread failure to update beliefs about the organization. The mistaken beliefs are perpetuated by three key factors: (i) a slow learning process, (ii) information asymmetry, and (iii) a narrative that is incorrect but politically useful for knowledgeable actors. Consider first the learning process about OPEC. In 1960, OPEC was set up as an organization modeled after the Texas Railroad Commission, with the hopes that it would be able to act as a cartel and control oil prices. During the 1960s, OPEC member countries could not act as a cartel, because they did not control their own oil production decisions. In the 1970s, that changed, and OPEC enjoyed a huge success in altering the world oil market, thereby increasing the price of oil. This spurred actors inside and outside of OPEC to view the organization as a cartel. Yet it was not until 1982 that OPEC started to identify formal quotas and production targets for its members. In the 1980s, OPEC tried to actually function as a cartel, but failed to do so, as it could not enforce its agreements. Since the 1980s, OPEC has continued to try to function as a cartel. Despite its apparent ineffectiveness, observers have continued to view the organization in this light.

Second, an important information asymmetry exists regarding the slowly-accumulating evidence about the lack of OPEC’s influence on its members’ oil production. At least some thoughtful actors, inside and outside of OPEC, must have gradually realized that OPEC is ineffective as a cartel. A policymaker in an OPEC state who realizes that his own country makes production decisions that largely ignore OPEC’s decisions (or only follows those decisions when they are consistent with the state’s prior preferences) must surely realize that other OPEC members are doing the same, and thus the

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51 Krasner, 1974
52 Parra, 2004; Yergin, 2008
53 Such production decisions were made by the international oil companies. See Yergin, 2008; Sampson, 2009
organization is having no impact. Yet the global oil market is highly complex and its operations are largely opaque to most actors in world politics, outside of a relatively small group of people such as OPEC policymakers, oil company executives, and commodity traders in financial markets. The complexity and opacity creates the information asymmetry between those who really understand the relationship between the role of OPEC quotas and those who do not. The information asymmetry is an obstacle to belief updating. Consequently most of the world does not realize that OPEC is ineffective as a cartel. There is also the potential for cognitive dissonance here, in which policymakers inside OPEC do not reconcile their understanding of the oil market with their desire to believe in OPEC’s effectiveness.54

Crucially, the information asymmetry about OPEC’s impact is perpetuated by the fact that the OPEC-as-cartel narrative is politically useful for some key actors in world politics. Indeed, those most likely to realize that OPEC’s impotence as a cartel – like senior OPEC policymakers, oil company executives, and financial experts focusing on the oil markets – are the same actors who are least likely to want to undermine that narrative. For each actor, the widespread but flawed understanding of OPEC is politically useful.

For instance, politicians in OPEC receive political benefits, both at home and abroad, that are based on OPEC’s perceived economic influence. So long as OPEC is viewed as powerful, its leaders can claim credit at home for their ‘economic stewardship’ of the global economy. There is evidence that leaders of OPEC member states have sought to take credit for their rising economic fortunes in exactly this way. For example, supporters of Venezuelan President Hugo Chavez, who was elected in 1998 as oil prices were plunging, argue that Chavez revitalized OPEC and thus almost single-handedly brought about the rise in world oil prices.55 This narrative gives Chavez a significant political asset in Venezuelan

54 Thus a former Secretary General of OPEC insists that OPEC shapes world oil prices: “The control was, and remains, long-distance, erratic, imprecise, and unpredictable – but in the end, very real. ... The system is slow, clumsy, partly dependent on necessarily inaccurate demand forecasts, and bedeviled by indiscipline within OPEC’s ranks. But, by and large, it works.” (Parra, 2004: 321-322)
domestic politics. Similarly, Iranian leaders have sought to use OPEC to take credit in the eyes of the Iranian public. OPEC thus serves as a useful tool for state leaders when communicating with their domestic constituency. In addition, the perceived power of OPEC allows its members to reap political rewards in terms of diplomatic influence and the attention paid to OPEC leaders. Perceived power brings prestige, and as Morgenthau noted decades ago, prestige is the currency of international diplomacy. With so much riding on the notion that OPEC is a powerful institution, policymakers of its member countries gain nothing from exposing OPEC as an ineffective cartel.

Similarly, other actors find “OPEC-as-cartel” a politically useful narrative. Multinational oil company executives find OPEC a useful scapegoat in oil-importing countries: politicians and journalists blame OPEC for high prices whenever they occur. Oil executives presumably are satisfied that the body politic has someone else to blame for oil prices, and thus are content to leave the OPEC-as-cartel narrative in place. Financial experts and commodity traders in the oil market may also be aware that OPEC has little impact on the long-term fundamentals of oil production and inventories, but that is not their only concern. They must be concerned about perceptions in the oil market, and OPEC announcements do matter in the short-term as price-signals that affect perceptions. As for the long-term fundamentals, market traders have their own data on oil inventories and production.

Interestingly, having an identifiable ‘external enemy’ to blame for oil and gasoline prices appears to also serve a useful political purpose in the United States and other oil-importing states. For instance, the No Oil Producing Exporting Cartels (NOPEC) Act of 2004 introduced in the United States

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56 For instance, Iran’s delegate to OPEC argued in 2011 that “the global economy has been faced with deep and serious crises and Iran with the cooperation of other OPEC member states, after a careful study of the oil market and through making correct decisions has not allowed crude oil prices to drop under these circumstances.” Mohammad Ali Khatibi, Aug 28, 2011, [http://www.presstv.ir/detail/196196.html](http://www.presstv.ir/detail/196196.html) Also see “Iran takes credit for OPEC decisions” (2011); and Krauss, 2011. Iranian officials argue that OPEC has significant economic accomplishments and that Iranian leadership within OPEC plays a major role in those successes; see OPEC Bulletin, October 2010: 8-10.

57 Morgenthau, et al. [1948] 2005
Senate served as a rallying point for policymakers to blame OPEC for high gasoline prices. Similar NOPEC bills have introduced at least fifteen times since 1999, though none have been passed. The continued introduction of these bills in the face of repeated past failures seems to suggest that the NOPEC bills serve a symbolic, political function rather than any real attempt to adjust US policies or the global oil market.

Understanding OPEC’s political functions, rather than looking at it as a cartel, helps us understand other questions. One such issue is the variation in OPEC’s membership. In the 1970s, OPEC enjoyed a certain level of prestige, as developing countries saw it as an organization that took on the power of the developed countries and won. Several oil-exporting developing countries that were not already members wanted into the club: Ecuador and Gabon joined the organization in 1973 and 1975 respectively, only to leave the organization as its prestige fell in the 1990s. Then in the 2000s, with oil prices on the rise, OPEC membership became fashionable again: Ecuador rejoined, Angola was accepted as a new member in 2007, and Sudan sought membership, though it has not (yet) been accepted. This variation in OPEC membership is counter-intuitive behavior if OPEC is viewed as a cartel, as membership in the organization would be most costly (in terms of forgone oil sales, to the extent that such exist) at times when oil prices are high. The fluctuations in OPEC’s membership, which correlate with oil prices, make more sense when viewed from the perspective of the perceived political clout and prestige of the organization.

In sum, the story of OPEC’s continued existence is primarily a political one. It is based largely on the perpetuation of a false narrative. Still, it is not necessarily true that OPEC is useless in its current form. OPEC probably facilitates information-sharing and lowers transaction costs between states, like

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58 Reinker, 2004
59 Verrastro, et al. 2011
60 It is unclear on which side of the information asymmetry US politicians actually lie, as some or even all may genuinely believe that OPEC have a significant impact on world oil prices.
many other international regimes. Information sharing is important in the opaque oil industry, where much of the precise information (including field-level oil reserves, production costs, etc.) is guarded as national secrets in many OPEC countries. For instance, OPEC has long served as a forum where members could share information about strategies for dealing with the international oil companies, best-practices for writing contracts, and approaches to tax policy. OPEC members also share information and predictions about the oil market, which are important for making investment and production capacity decisions. Overall, though, OPEC’s chief purpose appears to be primarily political.

Conclusion

This paper argues that OPEC does not operate effectively as a cartel, and has little if any power to manipulate the world price of oil by restricting its members’ production. OPEC quotas are irregularly applied, frequently ignored by its members, and have at most a modest effect on actual production. Instead, the legacy of 1973 has allowed scholars and policymakers both inside and outside of OPEC to continue in the mistaken belief that OPEC has great power over oil markets.

My findings carry significant implications for both theory and practice. For theory, the fact that a widespread belief about the world’s most important commodity market appears to be wrong has significant consequences for the study of international political economy. One of the implications is that scholars should be careful about how the bargaining dynamics within OPEC are studied and conceptualized, as they do not occur within the context of a classic economic cartel. OPEC appears to be an exceptionally important case what Snidal pointed out decades ago, which is that international

61 Keohane, 1984
62 Parra, 2004; Skeet, 1991; Ahrari, 1986 For example, a 1962 report commissioned by OPEC revealed to its members the extent of oil company profits and the lack of a logical economic basis for posted prices. Since tax and royalty payments were based on posted prices, the report had major implications for OPEC member governments’ revenues.
63 Blades, 2004; Alt et al., 1988
regimes often serve other functions rather than solve to PD games.\textsuperscript{64} It also appears to fall within a larger class of international regimes that have outlived their original mandates, which have been the object of recent research.\textsuperscript{65} Further, the findings imply that scholars of international trade and power politics should be wary of the assumption that OPEC has significant market power; rather, it may be more appropriate to model the market decisions of individual OPEC members, such as Saudi Arabia. Finally, this paper contributes to recent arguments that suggest that the extent of the international security threat posed by OPEC to oil-importing countries is often exaggerated.\textsuperscript{66}

In the realm of practical politics, journalists and pundits should stop using the blind assumption that OPEC’s actions are one of the fundamental drivers of world energy markets. They are not. Most of the credit or blame for rising oil prices in recent years rests with the energy demands of millions of Chinese customers, not diabolic moves by OPEC leaders. Moreover, policymakers in oil-importing countries, especially the United States, should stop being so fearful and resentful of OPEC. Legislation such as the various “NOPEC” bills in the US Congress may be useful for scoring political points, but they have little bearing on the reality of the global oil markets. With the world price of oil set by market forces almost entirely outside of its control, OPEC is along for the ride like everyone else.

\textsuperscript{64} Snidal, 1985
\textsuperscript{65} Barnett and Finnemore, 1999; Bernholz, 2009; Gray, 2011
\textsuperscript{66} Gholz and Press, 2010
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Figure 1: World Oil Prices and OPEC quotas, 1982-2009

Correlation (1986-2009)
R-sqr = 0.15

Quota OPEC-10  Oil price (WTI)
Table 1: Over-production by OPEC member states, 1982-2009

<table>
<thead>
<tr>
<th>OPEC Member</th>
<th>% Months Production Exceeds Quota</th>
<th>Correlation between Production and Quota*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Algeria</td>
<td>100%</td>
<td>0.014</td>
</tr>
<tr>
<td>Iran</td>
<td>72%</td>
<td>0.000</td>
</tr>
<tr>
<td>Iraq**</td>
<td>82%</td>
<td>0.000</td>
</tr>
<tr>
<td>Kuwait</td>
<td>90%</td>
<td>0.002</td>
</tr>
<tr>
<td>Libya</td>
<td>83%</td>
<td>0.014</td>
</tr>
<tr>
<td>Nigeria</td>
<td>88%</td>
<td>0.002</td>
</tr>
<tr>
<td>Qatar</td>
<td>90%</td>
<td>0.004</td>
</tr>
<tr>
<td>Saudi Arabia</td>
<td>82%</td>
<td>0.007</td>
</tr>
<tr>
<td>U.A.E.</td>
<td>96%</td>
<td>0.006</td>
</tr>
<tr>
<td>Venezuela</td>
<td>77%</td>
<td>0.002</td>
</tr>
<tr>
<td>OPEC-9 (excl Iraq)</td>
<td>96%</td>
<td><strong>0.018</strong></td>
</tr>
</tbody>
</table>

* Values displayed are R-sqr coefficients from bivariate OLS regression of first-differences.

**Italics indicate that the quota variable had statistical significance at p<0.05.

** Up to March 1998 only. Iraq was not assigned an OPEC quota after March 1998.
Table 2: Regression analysis on states’ depletion rates, 1980-2004

<table>
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<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
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<td>-0.932</td>
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<tr>
<td></td>
<td>(0.977)**</td>
<td>(0.974)</td>
<td>(0.958)</td>
<td>(1.009)</td>
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<td>Polity Score</td>
<td>0.081</td>
<td>0.072</td>
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<td></td>
<td>(0.055)</td>
<td>(0.052)</td>
<td>(0.064)</td>
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<tr>
<td>Market Position</td>
<td>-0.632</td>
<td>-0.726</td>
<td>-0.633</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.231)***</td>
<td>(0.242)***</td>
<td>(0.232)***</td>
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<tr>
<td>International War</td>
<td>-1.588</td>
<td>-0.888</td>
<td>-1.64</td>
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<tr>
<td></td>
<td>(0.737)**</td>
<td>(0.724)</td>
<td>(0.701)**</td>
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<td>International Sanctions</td>
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<td></td>
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<td>(0.579)</td>
<td>(0.637)</td>
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</tr>
<tr>
<td>Corruption</td>
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<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.221)**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lift Cost</td>
<td></td>
<td></td>
<td>-0.139</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(0.195)</td>
<td></td>
</tr>
</tbody>
</table>

Observations: 1077, 1009, 1009

Robust z statistics in parentheses, clustered by state.
* significant at 10%; ** significant at 5%; *** significant at 1%