



When Has OPEC Spare Capacity Mattered for Oil Prices?

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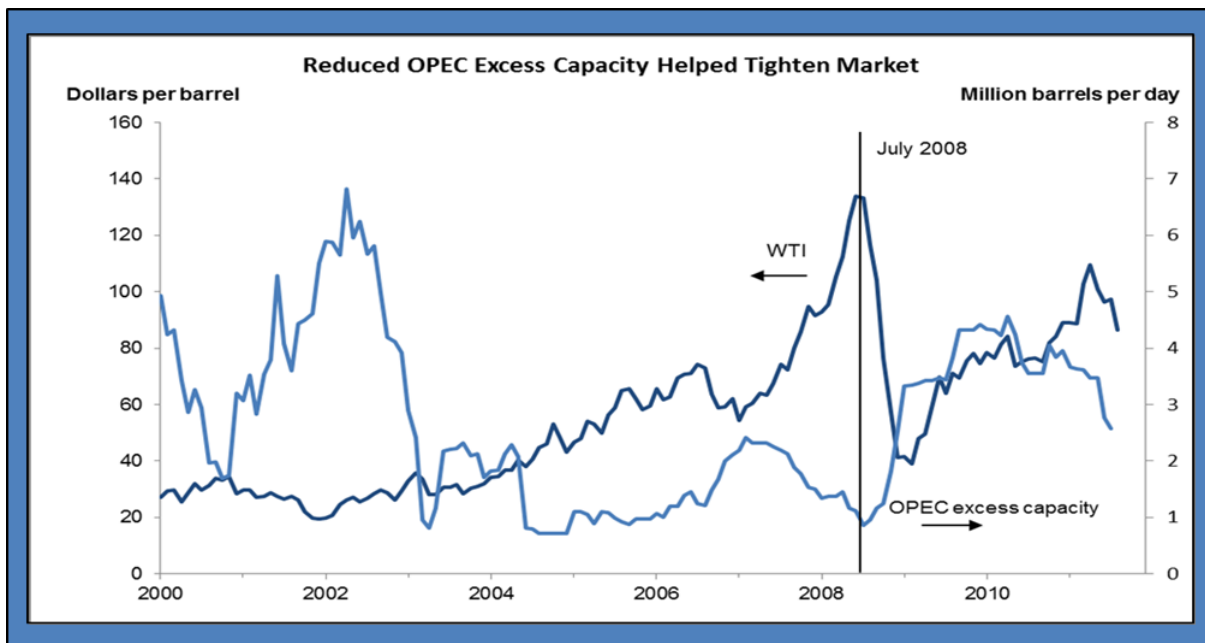
Oil prices are usually influenced by a number of factors. But there have arguably been times when OPEC spare capacity has been the most important factor for driving oil prices. This paper discusses the circumstances when this has likely been the case in the past.

In order to motivate why the spare capacity situation might be quite important to the behavior of crude oil prices, one can review the circumstances of 2008. The events of that year showed what can happen if the oil excess-capacity cushion becomes quite small. At the time, the role of the spot price of oil was arguably to find a level that would bring about sufficient demand destruction, after which the spot price of oil spectacularly dropped.

2008: A Clear Relationship

Figure 1 illustrates that when OPEC excess capacity levels reached pinch-point levels in 2008, the price of crude oil responded by exploding.

Figure 1

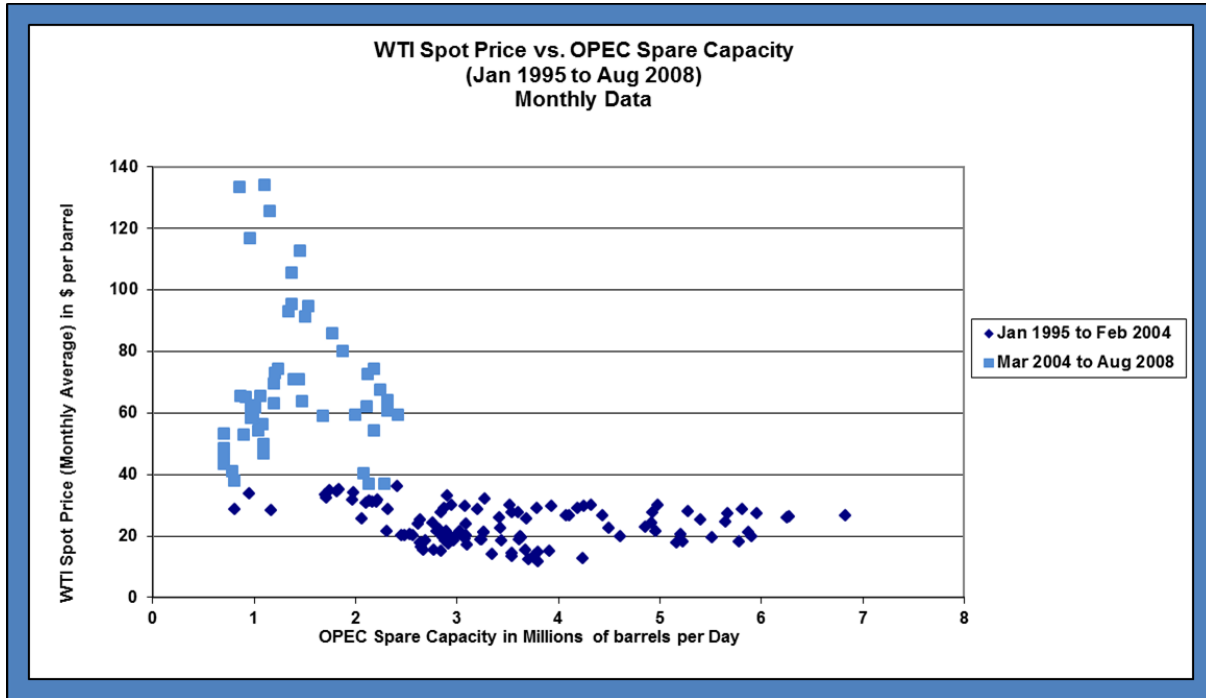


Source: Plante and Yücel (2011), Chart 2. [The dark blue line is WTI prices while the light blue line is OPEC excess capacity.] Authors' Notes: Oil prices are monthly averages. Sources of Data: U.S. Energy Information Administration (EIA) and the *Wall Street Journal*.



Figure 2 provides another way of illustrating what happened to the price of crude oil as OPEC spare capacity collapsed in mid-2008.

Figure 2



Source: Till (2014), Slide 19.

Sources of Data:

The WTI Spot Price is the "Bloomberg West Texas Intermediate Cushing Crude Oil Spot Price," accessible from the Bloomberg using the following ticker: "USCRWTIC <index>".

The following Bloomberg formula was used to create a monthly data set from daily prices:
`bdh("USCRWTIC Index", "px last", "1/1/1995", "8/31/2008", "per=cm", "quote=g")`

The OPEC Spare Capacity data is from the U.S. Energy Information Administration's website, which was accessed on 8/30/14.

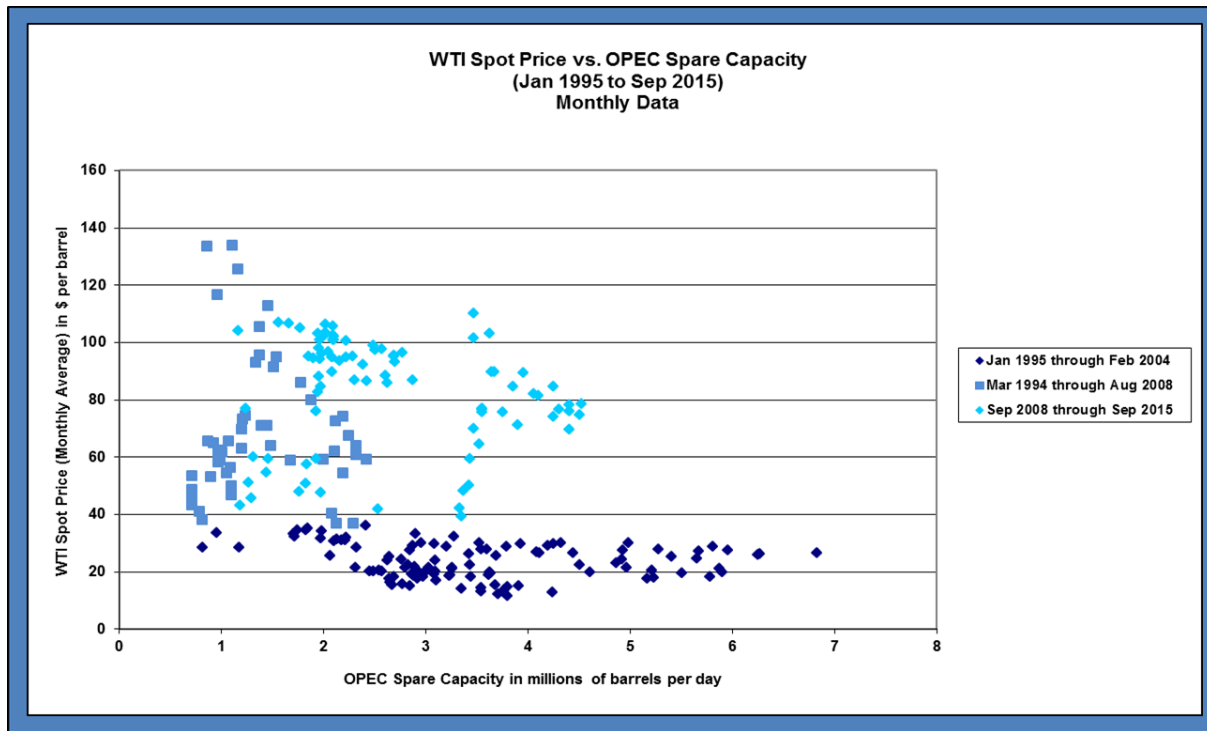
Presenting data in this fashion is based on Büyükaşahin *et al.* (2008), Figure 10, which has a similar, but not identical, graph. Their graph, instead, shows "Non-Saudi crude oil spare production capacity" on the x-axis.



Post-2008: An Unclear Relationship

After 2008, the relationship illustrated in Figure 2 structurally changed. This is illustrated in Figure 3 with the addition of data from September 2008 through September 2015. Using data through September 2015, it is not clear what the relationship between WTI oil prices and OPEC spare capacity is, if any.

Figure 3



Sources of Data:

The WTI Spot Price is the "Bloomberg West Texas Intermediate Cushing Crude Oil Spot Price," accessible from the Bloomberg using the following ticker: "USCRWTIC <index>".

The following Bloomberg formula was used to create a monthly data set from daily prices:
`bdh("USCRWTIC Index","px last","1/1/1995","9/30/2015","per=cm","quote=g")`

The OPEC Spare Capacity data is from the U.S. Energy Information Administration’s website, which was accessed on 8/30/14 (for the 1995 data) and on 10/24/15 (for the 1996 through September 2015 data.)

Presenting data in this fashion is based on Büyükşahin *et al.* (2008) and Büyükşahin (2011).

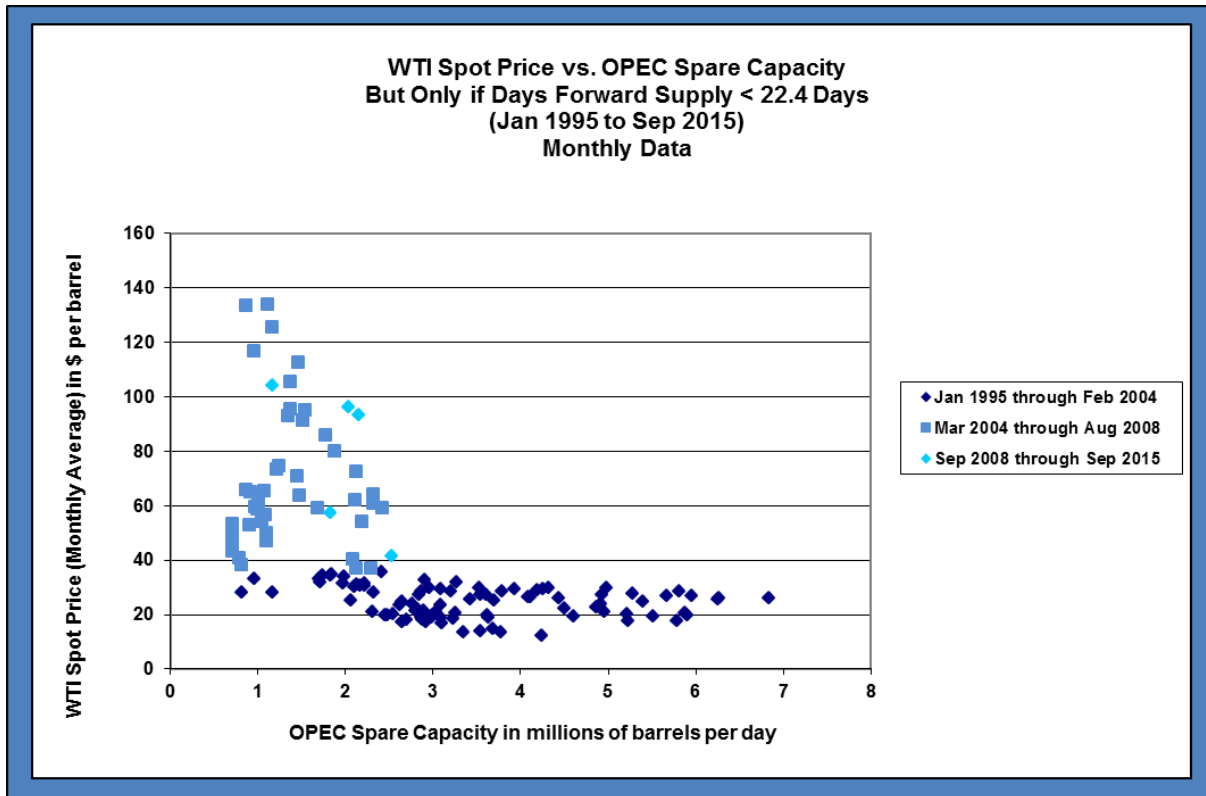
A Clear Relationship Re-emerges

It may only be in a certain state-of-the-world that OPEC spare capacity matters. But what precisely describes that particular state-of-the-world? Ori (2015) essentially provides the answer: *OPEC spare capacity should only matter if one is in a state of low inventories.*



Figure 3 can be re-examined based on Ori (2015)'s insight. The relationship between WTI oil prices and OPEC spare capacity from January 1995 through September 2015 is examined, *but only when crude oil inventories are low*. This particular conditional examination is illustrated in Figure 4. At least over the period, January 1995 through September 2015, it is apparent that tight levels of OPEC spare capacity had only mattered when (U.S.) oil inventories were low. Here, the low levels of inventories are defined as being under 22.4 days-of-forward-supply-of-crude-oil in the U.S.

Figure 4



Sources of Data:

The WTI Spot Price is the "Bloomberg West Texas Intermediate Cushing Crude Oil Spot Price," accessible from the Bloomberg using the following ticker: "USCRWTIC <index>".

The following Bloomberg formula was used to create a monthly data set from daily prices:
`bdh("USCRWTIC Index","px last","1/1/1995","9/30/2015","per=cm","quote=g")`

The OPEC Spare Capacity data is from the U.S. Energy Information Administration's website, which was accessed on 8/30/14 (for the 1995 data) and on 10/24/15 (for the 1996 through September 2015 data.)

"Days Forward Supply" refers to the U.S. Department of Energy's U.S. Days-of-Supply-for-Crude-Oil, accessible from the Bloomberg using the following ticker: "DSUPCRUD <index>".

The following Bloomberg formula was used to create a monthly data set from weekly data:
`bdh("DSUPCRUD Index","px last","1/1/1995","9/30/2015","per=cm","quote=g")`

Presenting data in this fashion is based on Büyüksahin *et al.* (2008) and Büyüksahin (2011).



A Debate on Practical Relevance

The data set in this paper is largely during the period when OPEC, and specifically Saudi Arabia, had been considered the swing producer for the oil market, and who traditionally attempted to prevent a free fall in the price oil. When there was sufficient spare capacity, these producers, in effect, underwrote an (implicit) put on the price of oil, as explained in Till (2015). It was only when there had been insufficient OPEC spare capacity that oil prices spiked.

Perhaps going forward, U.S. shale producers will instead be considered the swing producers, but in their case, their actions would cap the price of oil. These producers would, in effect, be underwriting an (implicit) call on the price of oil, as argued in Citi Research (2015). The price spikes illustrated in the survey paper would thereby not be expected to occur in the future.

On the other hand, Coy (2015) has argued against the view that “America’s shale oil industry has supplanted OPEC as the so-called ‘swing’ producer,” noting that “a true swing producer has freedom of action.” Explained Coy (2015): A swing producer “has a large market share, spare capacity, and very low production costs, and it is capable of acting strategically—alone or in a cartel—to raise and lower production to affect the price. Saudi Arabia fits that description; America’s shale producers don’t.”

Continued Coy (2015): “The shale players are too small to move prices on their own, and they don’t act in concert. Shale producers have essentially no spare capacity because they’re always producing as much as they profitably can. Production costs are also far higher than those of the Saudis or Kuwaitis. In the language of economics, U.S. shale producers are price takers, not price setters.” Under Coy (2015)’s framework, the survey paper’s results *would* continue to have practical relevance.

Conclusion

Based on an examination of data over the past 20 years, OPEC spare capacity has only dramatically mattered for oil prices when (U.S.) crude oil inventories have been below a threshold level. That said, the survey paper’s practical relevance depends on whether the U.S. shale industry supplants OPEC as the world’s true swing producer.

Endnote

The title of the SSRN version of this article is “OPEC Spare Capacity and Oil Prices.”

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Keywords

Crude oil prices, OPEC spare capacity