The Economic Cost of a Moratorium on Offshore Oil and Gas Exploration to the Gulf Region

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July 2010

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Executive Summary

In the wake of the recent *Deepwater Horizon* oil rig spill, federal lawmakers have struggled both to address the causes of this rare and disastrous event and to enact policies to guide the environmental and economic recovery of the Gulf region. As part of its effort to respond to the crisis, the Obama administration issued a moratorium on offshore deepwater drilling (first enacted on May 30th, 2010). The goal of the moratorium is to shield the Gulf from further harmful effects by limiting the likelihood of a similar oil spill in the future. The moratorium, however, will do more harm than good. By ceasing offshore drilling, even for as little as six months, the moratorium will further depress onshore state and local economies dependent on oil production. Evidence indicates that the *Deepwater Horizon* spill was attributable to a lack of sufficient oversight during the transition of the rig from exploration to commercial production. Halting all offshore deepwater drilling in response to a likely low-probability event serves neither to address the root causes of the accident, nor to aid in the economic rehabilitation of the Gulf region. Indeed, a moratorium on offshore drilling would result in billions of dollars in *additional* lost economic activity in the Gulf.

The Fifth Circuit Court of Appeals agreed with this line of reasoning by refusing to reverse the lower court's stay of the May 30th, 2010 moratorium. The court found that President Obama's administration "failed to demonstrate the likelihood that the district court's ruling would cause irreparable injury during the time that the administration's appeal is pending."[1] Undeterred by the court ruling, the current administration issued a new moratorium on July 12th, 2010. The moratorium reasserts the policies outlined on May 30th, 2010 with an additional caveat that would include all floating facilities.[2] Such a comprehensive measure could further cripple the economy of the Gulf region. The new moratorium maintains the timeframe of May 30th policy and will be in effect until November 30th.

In this report, Dr. Joseph R. Mason investigates the resultant economic effects if either moratorium is allowed to stand.[3] By analyzing the total economic harm associated with the moratorium, Dr. Mason finds that there would be broad economic losses within the Gulf region and throughout the nation as a whole. He uses the Bureau of Economic Analysis's RIMS II "input-output" analysis to measure the economic effects associated with a potential production stoppage. Table 1 summarizes the results. Dr. Mason concludes that President Obama's moratorium will have grave economic consequences for the Gulf and the nation.

Table 1
Summary of Potential Lost Economic Activity

	Total GOM	Total U.S.	Spillover Effects
Output ($ Mil)	-$2,110	-$2,769	-$659
Employment (Jobs)	-8,169	-12,046	-3,877
Wages ($ Mil)	-$487	-$707	-$219
State & Local Tax Revenues ($ Mil)	-$98	N/A	N/A
Federal Tax Revenues ($ Mil)	N/A	-$219	N/A

Note: Production is assumed to be stopped for six months. Losses are expected to accrue over 12 months following the start of the moratorium, on May 30th, 2010.

[1] Courts Block Deepwater Drilling Moratorium, Salazar Issues Revision in Response, *OMB Watch*, Jul. 13, 2010 (available at http://www.ombwatch.org/ node/11131).
[2] Press Release, U.S. Department of the Interior, Interior Issues New Suspensions to Guide Safe Pause on Deepwater Drilling, Jul. 12, 2010.
[3] Dr. Mason's work measures the effect of a moratorium since May 30th, which effectively encompasses the rejected May 30th moratorium and the more recent July 12th moratorium, since both measures result in a six-month moratorium. Dr. Mason's work does not account for new provisions in the July 12th moratorium – and thus may be conservative estimates in that regard.

I. INTRODUCTION

The recent *Deepwater Horizon* oil rig disaster and President Obama's subsequent Offshore Deepwater Drilling Moratorium ("moratorium"), originally issued on May 30th, have fanned the flames of the already heated debate over the extent to which drilling for oil and natural gas off U.S. coasts should be permitted. Until recently, the U.S. government has withdrawn leases from areas between 3 and 200 miles off the coasts of 20 states for the extraction of oil and natural gas.[4]

Even prior to the April 20th, 2010 explosion on Transocean's *Deepwater Horizon* rig, which was leased to British Petroleum (BP), policymakers argued that the federal moratoria should be renewed. In an effort to respond to the explosion and subsequent oil spill, President Obama issued a moratorium on exploratory deepwater rigs. The President acknowledged that the moratorium would create problems "for the people who work on [offshore] rigs, but for the sake of their safety, and for the sake of the entire region, [the government needs] to know the facts before [they] allow deepwater drilling to continue."[5] These restrictions, however, are causing significant hardship and economic loss to communities already dealing with a historic recession.

The White House issued the moratorium on May 30th, 2010, stating the need to investigate the causes of the spill and to determine if future spills were possible. The moratorium states:

> The Moratorium Notice to Lessees and Operators (Moratorium NTL) issued today directs oil and gas lessees and operators to cease drilling new deepwater wells, including wellbore sidetrack and bypass activities; prohibits the spudding of any new deepwater wells; and puts oil and gas lessees and operators on notice that, with certain exceptions, MMS will not consider for six months drilling permits for deepwater wells and for related activities. For the purposes of the Moratorium NTL, "deepwater" means depths greater than 500 feet... Activities necessary to support existing deepwater production may continue, but operators must obtain approval of those activities from the Department of the Interior.[6]

The moratorium banned deepwater drilling activity, but allowed existing production to continue.[7]

Critics claim that this policy is unjustified, arbitrary, and capricious given the economic harm it will inflict upon communities dependent upon offshore drilling for jobs and revenue.[8] Accordingly, a federal judge in New Orleans blocked enforcement of the moratorium, writing that "[t]he blanket moratorium, with no parameters, seems to assume that because one rig failed and although no one yet fully knows why, all companies and rigs drilling new wells over 500 feet also universally present an imminent danger,"[9] justifying the taking of economic value from private sector jobs and firms. Although the Obama administration has already filed an appeal with a higher court, the judge's decision demonstrates the need to consider how the moratorium on offshore drilling will affect the economies of the Gulf states (Louisiana,

"Even prior to the April 20th, 2010 explosion on Transocean's Deepwater Horizon rig, which was leased to British Petroleum (BP), policymakers argued that the federal moratoria should be renewed."

[4] U.S. Department of the Interior, Minerals Management Service, Report to Congress: Comprehensive Inventory of U.S. OCS Oil and Natural Gas Reserves, Feb. 2006 [hereinafter MMS Report to Congress], at xii ("Part or all of nine OCS planning areas, which include waters off 20 coastal states, have been subject to longstanding leasing moratoria enacted annually as part of the Interior and related agencies appropriations legislation, or are withdrawn from leasing until June 30, 2012, as the result of presidential withdrawal (under section 12 of the OCSLA). Some of these areas contain large amounts of technically recoverable oil and natural gas resources."). See also id. at 3 ("The Federal OCS generally extends from 3 to 200 miles offshore and covers an area of about 1.76 billion acres.").

[5] President Barack Obama, Remarks by the President to the Nation on the BP Oil Spill, The White House, Jun. 15, 2010, (transcript available at http://www.whitehouse.gov/the-press-office/remarks-president-nation-bp-oil-spill).

[6] Press Release, U.S. Department of the Interior, Interior Issues Directive to Guide Safe, Six-Month Moratorium on Deepwater Drilling (May 30, 2010) (available at http://www.doi.gov/news/pressreleases/Interior-Issues-Directive-to-Guide-Safe-Six-Month-Moratorium-on-Deepwater-Drilling.cfm).

[7] While the moratorium is a de jure stoppage in deepwater, the lack of precise safety regimes going forward has resulted in a de facto stoppage of all drilling.

[8] Matt Stephens, Offshore drilling moratorium hurting local companies, *The Courier*, Jul. 13, 2010 (available at http://www.hcnonline.com/articles/2010/07/13/conroe_courier/news/moratorium071410.txt).

[9] Laurel Brubaker Calkins & Margret Cronin Fisk, Deepwater Drilling Ban Lifted by New Orleans Federal Judge, Bloomberg, Jun 23, 2010 [hereinafter Deepwater Ban Lifted by Judge] (available at http://www.bloomberg.com/news/2010-06-22/u-s-deepwater-oil-drilling-ban-lifted-today-by-new-orleans-federal-judge.html).

"A significant halt to oil and natural gas exploration and drilling would not just affect upstream and downstream industries, but could also impact state and local governments, as well as small retail stores, education services, healthcare assistance, and a host of other industries.

Texas, Florida, Alabama, and Mississippi), as well as the nation as a whole. Despite these legitimate concerns, the Obama administration issued a new moratorium on July 12th, 2010 – which in fact expands on the original moratorium to include all floating facilities.[10]

In this study, I estimate the total economic harm associated with the White House moratorium on deepwater drilling.[11] I use data from the U.S. Department of the Interior, Department of Energy, Census Bureau, and the Treasury Department to estimate the total decrease in output, employment, wages, and public revenues to the Gulf states and the nation as a whole. Additionally, I use figures presented by Louisiana Mid Continent Oil and Gas Association and estimated by Wood Mackenzie Research and Consulting to get industry estimates for the effects of the moratorium.

My estimates suggest that the moratorium would produce broad economic losses within the Gulf region and throughout the nation as a whole. Given the integrated nature of the U.S. economy, a negative effect in one industry is likely to be felt throughout the country. A significant halt to oil and natural gas exploration and drilling would not just affect upstream and downstream industries, but could also impact state and local governments, as well as small retail stores, education services, healthcare assistance, and a host of other industries.

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The effective six-month moratorium on offshore oil and natural gas production will result in the loss of approximately $2.1 billion in output, 8,169 jobs, over $487 million in wages, and nearly $98 million in forfeited state tax revenues in the Gulf states alone. Additionally, although a significant portion of oil and natural gas production is localized in the Gulf, the U.S. is a fully integrated economy, so there is an expectation that the loss will "spill-over" into other states. From this spillover effect, there could be an additional loss of $0.6 billion in output, 3,877 jobs, and $219 million in potential wages nationwide. Moreover, the federal government stands to lose $219 million in tax revenue. These losses are dramatic in both the context of local economies in which the oil industry operates, and on a national scale.

The remaining sections of this study outline the specifics of the moratorium regulations, and provide the methodology for assessing the economic cost of the suspension of deepwater drilling. Section II provides some background on U.S. offshore oil and natural gas drilling, the *Deepwater Horizon* explosion, and the White House moratoriums. Section III describes the significance of offshore oil production activities to onshore economies. Section IV outlines the model this paper uses to predict the economic impacts of a moratorium on drilling. Section V provides estimates for oil and natural gas production in the Gulf of Mexico and the U.S. Section VI estimates the economic impact of the moratorium in the U.S. on both a regional and national level. Finally, Section VII discusses conclusions from this work, most importantly that the implementation of the deepwater drilling moratorium would be catastrophic to Gulf and national economies.

II. BACKGROUND ON U.S. OFFSHORE OIL PRODUCTION

Drilling for oil and natural gas off U.S. coasts has occurred since the late 19th century, beginning in California and eventually spreading to the Gulf of

[10] Press Release, U.S. Department of the Interior, Interior Issues New Suspensions to Guide Safe Pause on Deepwater Drilling, Jul. 12, 2010.
[11] My analysis considers the moratorium to be in effect since May 30th, 2010, the date of the first moratorium. I do not consider the expanded scope of the new moratorium, which includes all floating facilities. Thus, my results in this respect may be conservative.

> **"By the mid-20th, oil was surpassed only by income taxes as the largest generator of revenue for the U.S. government."**

Mexico and Atlantic coasts.[12] This expansion was spurred largely by the advent of the internal combustion engine and accompanying increase in demand for gasoline, improvements in technology, the development of modern seismology, and profitability of offshore drilling to local economies.[13] By the mid-20th, oil was surpassed only by income taxes as the largest generator of revenue for the U.S. government.[14] Growth of the industry was slowed, however, as the government imposed a legislative moratorium on new drilling on the Outer Continental Shelf (OCS) in 1981.[15] President George H.W. Bush signed an executive ban reinforcing this congressional moratorium in 1990.[16]

A few years ago, government policies towards offshore drilling once again changed direction. As gas prices skyrocketed, the government faced strong pressures to find solutions that would offer relief.[17] In 2008, the same year that the congressional moratorium was set to expire, President George W. Bush terminated the executive ban previously in place.[18] Then, on March 31st, 2010, President Obama proposed the opening of new stretches of water along the Atlantic, Gulf of Mexico, and Alaskan coasts to oil and gas drilling.[19] As expected, the proposal drew significant criticism from environmental groups.[20]

Less than a month after President Obama unveiled his proposal, the debate was renewed by an explosion on the *Deepwater Horizon* oil rig 40 miles off the coast of Louisiana. The rig, a joint venture between Transocean and BP, sank into the Gulf of Mexico following the April 20th explosion at the facility. Since that time, the well that had been attached to the rig has continued to spill oil into the Gulf of Mexico. Though BP has attempted to stop the spill using a variety of methods, the company has thus far been unable to seal the leak or substantially contain the damage. While precise damage from the spill cannot be accurately estimated in the short term, news sources and investigators estimate that somewhere between 1,000 and 100,000 barrels of oil are leaked per day.[21]

On April 30th, 2010, in a dramatic response to the unprecedented disaster,[22] President Obama imposed a stay on deepwater drilling until the exact cause of the explosion could be determined.[23] Although there has been much speculation about the source of the explosion and the failures to stop the spill, many analysts have opined that the proximate causes of the *Deepwater Horizon* disaster were "gross negligence or willful misconduct."[24] One *Washington Post* writer noted that "[n]ot only did BP take shortcuts during the drilling of the well and ignore warning signs in the final few weeks before it blew, but it has repeatedly botched the cleanup effort and engaged in ham-handed tactics to keep the media in the dark."[25] Nonetheless, one month later, the secretary of the Interior announced a moratorium on all exploratory offshore drilling.

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[12] National Ocean Industries Association (NOIA) (available at http://www.noia.org/website/article.asp?id=123); Rick Jervis, William M. Welch and Richard Wolf, Worth the risk? Debate on offshore drilling heats up, *USA Today*, Jul. 14, 2008 (available at http://www.usatoday.com/money/industries/energy/2008-07-13-offshore-drilling_N.htm).

[13] Id.

[14] National Ocean Industries Association (NOIA).

[15] Outer Continental Shelf (OCS): Supplies, Bans, and Natural Seeps, Institute for Energy Research (IER), (available at http://www.instituteforenergyresearch.org/cleaning-up-the-environment-one-more-reason-to-develop-the-outer-continental-shelf/); Offshore Drilling and Exploration, The *New York Times,* (discussion available at http://topics.nytimes.com/top/reference/timestopics/subjects/o/offshore_drilling_and_exploration/index.html?scp=1-spot&sq=offshore%20drilling&st=cse) [hereinafter Offshore Drilling and Exploration.]. [Some sources put the exact date in 1982.]

[16] Id.

[17] Offshore Drilling and Exploration, supra.

[18] Outer Continental Shelf (OCS): Supplies, Bans, and Natural Seeps, Institute for Energy Research (IER).

[19] John M. Broder, Obama to Open Offshore Areas to Oil Drilling for First Time, The *New York Times*, Mar. 30, 2010 (available at http://www.nytimes.com/2010/03/31/science/earth/31energy.html).

[20] Offshore Drilling and Exploration, supra.

[21] Deborah Zabarenko, Hustle and flow: how much oil is really gushing? *Reuters,* Jun. 25, 2010, (available at http://www.reuters.com/article/idUSTRE65O3C720100625).

[22] In 1969, an offshore platform explosion off the coast of Santa Barbara occurred. Approximately three million gallons of crude oil spilled from the cracks in the channel floor. The explosion was caused by a crack at the bottom of the Santa Barbara Channel. Darren Hardy, 1969 Santa Barbara Oil Spill http://www2.bren.ucsb.edu/~dhardy/1969_Santa_Barbara_Oil_Spill/Home.html.

[23] Timeline: Gulf of Mexico oil spill, *Reuters*, Jun. 28, 2010 (available at http://www.reuters.com/article/idUSTRE65R42W20100628?loomia_ow=t0:s0:a49:g43:r1:c0.197842:b35266052:z).

[24] Edward Tan and John E. Morris, The Drill: Et Tu, Anadarko?, *Wall Street Journal,* Jun. 22, 2010 (available at http://online.wsj.com/article/BT-CO-20100622-703614.html?mod=WSJ_latestheadlines).

[25] Brendan Borrell, Which oil companies are more eco-friendly than the rest, The *Washington Post*, Jun. 29, 2010 (available at http://www.washingtonpost.com/wp-dyn/conte nt/article/2010/06/28/AR2010062803812.html).

> "Some findings implicate the 'use of a less robust well design, failure to anchor the well's casing using a process recommended under industry practices and cutting short procedures to ensure cementing was sound.'"

A. The Gulf Oil Spill

The spill began on April 20th, 2010 with an explosion on Transocean's *Deepwater Horizon* oil drilling rig. The explosion is reported to have been the culmination of poor communication, planning, and management by Transocean's leasing partner, BP. Transocean was "under contract with [BP] to drill an exploratory well."[26] In preparation for converting the well from exploration to commercial production, BP and Transocean were planning to temporarily close the well. On the day of the explosion, BP's site manager and the Transocean team met to discuss the future of the rig but did not disclose the precise details of their decision.[27] Halliburton was contracted to perform some repairs necessary for the reopening of the well, and had completed cementing "of casings in the well less than 24 hours prior to the accident."[28] Two days after the explosion, BP sent two remotely operated vehicles (ROVS) to investigate the damage and determined that there were two oil leaks at approximately 5,000 feet below sea level.

Over the past three months, BP and the U.S. government have worked on mechanisms to stop the well from dumping oil into the Gulf. Additionally, lawmakers have been attempting to decipher how such a disaster was permitted to occur.[29] Some findings implicate the "use of a less robust well design, failure to anchor the well's casing using a process recommended under industry practices and cutting short procedures to ensure cementing was sound."[30] By all accounts, the decision to use Halliburton's cementing method and create shortcuts in preparing the well for production was not in compliance with best practices. In preparation for the cementing, Halliburton even indicated that the well may have gas-flow issues.[31] Although investigations are still pending, by some accounts, BP appears to have chosen a riskier option for the design of the well to reduce costs, thereby putting the well in a precarious position even before the explosion.[32]

B. The White House Moratorium on Offshore Drilling and Exploration

The federal government's response to the *Deepwater Horizon* incident has been to block exploratory drilling in the region. However, the all-encompassing moratorium seems misguided given the primary allegations of disregard for best practices on the part of the involved parties as the proximate cause of the disaster. Instead, the overly-broad and unwarranted moratorium needlessly imposes economic costs on an already distressed region and a nation in recession.

Despite the prevailing public perception that the fault for the spill was attributable solely to negligent conduct by a small number of firms, the Obama administration ultimately imposed a six-month moratorium on all deepwater drilling projects,[33] citing the need to better understand what caused the accident before other endeavors can be considered safe.[34] The moratorium leaves already-producing rigs unaffected but would freeze 33 exploratory drilling projects and suspend the

[26] Alton Parrish, Timeline of Events in BP Oil Spill: Day by Day, April 20 to May 26, Before It's News, May 27, 2010 (available at http://beforeitsnews.com/news/50/386/Timeline_of_Events_in_BP_Oil_Spill:_Day_by_Day,_April_20_to_May_26.html) [hereinafter Parrish (May 27, 2010).

[27] BP, Transocean argues well plans before rig blast, CNN, May 26, 2010, (available at http://www.cnn.com/2010/US/05/26/oil.spill.investigation/index.html).

[28] Parrish (May 27, 2010), supra.

[29] "The more I learn about this accident, the more concerned I become. This catastrophe appears to have been caused by a calamitous series of equipment and operational failures. If the largest oil and oil services companies in the world had been more careful, 11 lives might have been saved and our coastlines protected." See Hearing on 'Inquiry into the Deepwater Horizon Gulf Coast Oil Spill' Before the Subcomm. On Oversight and Investigations Comm. on Energy and Commerce, 111th Cong. (May 12, 2010) (opening statement by Rep. Waxman, Chairman, Comm. on Energy and Commerce).

[30] Jeff Plungis. BP Raised Risks at 'Nightmare' Well, Lawmakers Say (Update 1), *Bloomberg–BusinessWeek,* Jun. 15, 2010, (available at http://www.businessweek.com/news/2010-06-15/bp-raised-risks-at-nightmare-well-lawmakers-say-update1-.html).

[31] Id.

[32] Matthew Daly and Ray Henry, Documents: BP cut corners in days before blowout, *Associated Press,* Jun. 14, 2010 (available at http://news.yahoo.com/s/ap/20100614/ap_on_bi_ge/us_gulf_oil_spill).

[33] Secretary of the Interior Ken Salazar recommended "a six-month moratorium on permits for new wells being drilled using floating rigs. The moratorium would allow for implementation of the measures proposed in this report and for consideration of the findings from ongoing investigations, including the bipartisan National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling. The Secretary further recommends an immediate halt to drilling operations on the 33 permitted wells, not including the relief wells currently being drilled by BP, that are currently being drilled using floating rigs in the Gulf of Mexico." (Increased Safety Measures for Energy Development on the Outer Continental Shelf, Department of the Interior, 3).

issuance of new permits, leaving time for investigations to be completed.[35] Secretary of the Interior Ken Salazar explained:

> The six-month moratorium on deepwater drilling will provide time to implement new safety requirements and to allow the Presidential Commission to complete its work. Deepwater production from the Gulf of Mexico will continue subject to close oversight and safety requirements, but deepwater drilling operations must safely come to a halt. With the BP oil spill still growing in the Gulf, and investigations and reviews still underway, a six-month pause in drilling is needed, appropriate, and prudent.[36]

A federal judge in New Orleans blocked the enforcement of this initial moratorium on June 22nd, 2010, citing a lack of basis for the regulation.[37] In response, the Obama administration issued a new moratorium on July 12th, 2010.[38] When asked about the differences between the two moratoriums, the Department of Interior stated,

> Like the deepwater drilling moratorium lifted by the district court on June 22nd, the deep-water drilling suspensions ordered today apply to most deep-water drilling activities and could last through November 30th. The suspensions ordered today, however, are the product of a new decision by the secretary and new evidence regarding safety concerns, blowout containment shortcomings within the industry, and spill response capabilities that are strained by the BP oil spill.[39]

The effective result of the reissued moratorium is that the original moratorium is renewed, so there is still a six-month moratorium. There were, however, several new provisions which include: 1) the moratorium is not based on drilling depth, but rather on the basis of drilling configurations and technologies; and 2) the new moratorium includes all floating facilities.[40] Regardless, the effective result is that there is currently an ongoing six-month moratorium on deepwater drilling.

"The effective result of the reissued moratorium is that the original moratorium is renewed, so there is still a six-month moratorium."

Unfortunately, the moratorium is not economically viable for the Gulf region and it imposes significant economic harm upon the rest of the U.S. Sections IV and V, therefore, discuss in detail the economic implications of this decision.

III. OFFSHORE OIL PRODUCTION STIMULATES DIVERSE ONSHORE ECONOMIES

Offshore oil production benefits federal, state, and local onshore economies. Broadly speaking, there are three "phases" of development that contribute to state economic growth: (1) the initial exploration and development of offshore facilities; (2) the extraction of oil reserves; and (3) the refining of crude oil into finished petroleum products. Businesses that support those phases are prevalent in the sections of the Gulf of Mexico that are currently open to offshore drilling. With regard to the exploration and development stage, the U.S. shipbuilding industry, for example, has a strong presence in the Gulf region and benefits significantly from initial offshore oil exploration efforts.[41] This early phase requires specialized exploration and drilling vessels, floating drilling rigs, and miles and miles of steel pipe, as well as highly–educated and specialized labor to staff the efforts; thus, the jobs and businesses involved in the production of these inputs are supported by offshore drilling.

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[34] Charlie Savage, Drilling Ban Blocked; US Will Issue New Order, The *New York Times* (available at http://www.nytimes.com/2010/06/23/us/23drill.html?scp=1&sq=offshore%20drilling%20moratorium&st=cse).
[35] Id.
[36] Press Release, U.S. Department of the Interior, Interior Issues Directive to Guide Safe, Six-Month Moratorium on Deepwater Drilling, May 30, 2010, (available at http://www.doi.gov/news/pressreleases/Interior-Issues-Directive-to-Guide-Safe-Six-Month-Moratorium-on-Deepwater-Drilling.cfm).
[37] Deepwater Ban Lifted by Judge, supra.
[38] Press Release, U.S. Department of the Interior, Interior Issues New Suspensions to Guide Safe Pause on Deepwater Drilling, Jul. 12, 2010.
[39] Greenspace, Gulf Oil Spill: New Moratorium Explained, LA Times Blog, Jul. 12, 2010 (available at http://latimesblogs.latimes.com/greenspace/2010/07/gulf-oil-spill-new-moratorium-explained.html).
[40] Press Release, U.S. Department of the Interior, Interior Issues New Suspensions to Guide Safe Pause on Deepwater Drilling, Jul. 12, 2010.
[41] U.S. Department of Commerce, Bureau of Export Administration, U.S. Shipbuilding and Repair, National Security Assessment (003-009-00719-4), at 9 ("In some niches, however, the United States currently has a significant world market share based mostly on domestic sales. These niches include offshore oil platforms, yachts, fast patrol boats, and recreational vessels," a preponderance of which are produced in the Gulf Coast region).

Along with production, onshore personnel work on the oil extraction phase as well. A recent report prepared for the U.S. Department of Energy indicates that Louisiana's economy is "highly dependent on a wide variety of industries that depend on offshore oil and gas production,"[42] and that offshore production supports onshore production in the chemicals, platform fabrication, drilling services, transportation, and gas processing industries.[43] Fleets of helicopters and U.S.-built vessels also supply offshore facilities with a wide range of industrial and consumer goods, from industrial spare parts to groceries.

The economic benefits produced by the refining phase are even more widespread than the effects of the two preceding phases. Although capacity is largely concentrated in California, Illinois, New Jersey, Louisiana, Pennsylvania, Texas, and Washington, additional U.S. refining capacity exists throughout the country.[44] As a result, refinery jobs, wages, and tax revenues are more likely to "spill-over" into other areas of the country, including non-coastal states like Illinois.

The economic benefits to coastal and state communities from offshore drilling are substantial. The Associated Press reports that offshore workers from Louisiana, for example, "frequently earn $50,000 a year or more."[45] One in three jobs in coastal Louisiana "is related to the oil and natural gas industry [and] many of the workers earn between $40,000 and $100,000 a year."[46] Louisiana alone could lose up to 10,000 jobs in only a few months.[47] The state of Louisiana estimates that oil and gas production, primarily from the Gulf, supports $12.7 billion in household earnings, "representing 15.4 percent of total Louisiana household earnings in 2005."[48]

The moratorium would put a halt to training new workers and cut jobs for workers already employed within the offshore industry. Additionally, offshore workers that lose their jobs due to the moratorium would receive only a fraction of their wages in unemployment benefits. This will directly affect local businesses, many of which were already weakened by Hurricane Katrina in 2005 and Hurricane Gustav in 2008. Some companies in Louisiana, for example, are already worried that after taking on "heavy debts after Hurricane Katrina [they] may not [be] able to take on additional loans."[49]

In response, President Obama asserted that the Small Business Administration "has stepped in to help businesses by approving loans [and] allowing many to defer existing loan payments."[50] This demonstrates a key understanding by the current administration that small businesses in the Gulf will be hit significantly by the moratorium. Additionally, it is unclear how much the approval and deferment of loans will mitigate the substantial losses taken by small businesses in the Gulf. Indeed, a far simpler solution would be to withdraw the moratorium and allow businesses to operate normally.

Wood Mackenzie Research and Consulting's findings about the impact of a six-month moratorium illustrate the extent to which the offshore industry contributes to local and state economies in the nation. Their research shows that as many as 1,400 workers would be left without jobs, and as many as 46,200 jobs, both on–and offshore, would go idle if the 33 drilling platforms were shut down.[51] The report goes on to say that as many as 120,000 jobs could be lost by 2014. Louisiana would lose 3,000 to 6,000 jobs alone in "the first two to three weeks and potentially more than 20,000 Louisiana jobs within the next twelve to eight months."[52]

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[42] Advanced Resources International, Inc., Basin Oriented Strategies for CO2 Enhanced Oil Recovery: Offshore Louisiana, Prepared for the U.S. Department of Energy, Mar. 2005, at EX-1.

[43] Id. ("For example, Louisiana is the third largest consumer of natural gas in the U.S., and a large number of chemical industry jobs in Louisiana are highly dependent on the continued availability of adequate volumes of moderately priced natural gas. Moreover, offshore oil and gas production operations support a vast spectrum of other activities in the state, including platform fabrication, drilling and related services, offshore transport and helicopter operations, and gas processing.").

[44] See Table A1 in the Appendix, infra.

[45] Cain Burdeau, Rig workers job hunt after drill ban, Associated Press for MSNBC, June 18, 2010, (available at http://www.msnbc.msn.com/id/37762247/ns/business-us_business/).

[46] Stephen C. Fehr, Gulf states fear long-term fiscal effects of oil disaster, *Stateline,* Jun. 24, 2010 (available at http://www.stateline.org/live/details/story?contentId=493859); Press Release, Just The Facts: Drilling Moratorium's Impact on Louisiana's Families and Economy, Government of Louisiana, Jun. 14, 2010 (available at http://emergency.louisiana.gov/Releases/06142010-moratorium.html) [hereinafter Just the Facts].

[47] The projected employment loss forecasted by my analysis is lower that the estimates presented in this section. The likely reason for this is that my assessment is conservative. For instance, I assume the period of loss from the moratorium is only six months, while the Louisiana Department of Economic Development assumes that the period of loss will be 12 to 18 months. Section VI, subsection F outlines some of the ways in which my analysis may create a lower bound for loss.

[48] Just the Facts, supra.

[49] Louisiana's economic hurt from drilling moratorium warrants action: An editorial, The *Times-Picayune*, Jun. 8, 2010 (available at http://www.nola.com/news/gulf-oil-spill/index.ssf/2010/06/louisianas_economic_hurt_from.html).

[50] President Barack Obama, Remarks by the President After Briefing on BP Oil Spill, The White House, May 28, 2010, (transcript available at http://www.whitehouse.gov/the-press-office/remarks-president-after-briefing-bp-oil-spill).

In addition to onshore businesses, smaller oil companies that stimulate the economy of the region will be crippled by the moratorium. Offshore drilling has helped develop the oil industry around the country by encouraging smaller companies to compete for business with larger players. The *Wall Street Journal* reports that the oil industry in the Gulf of Mexico was largely developed by relatively small oil and gas companies.[53] In the early 1990s "relatively small players like Kerr-McGee, Ocean Energy and Unocal were acquiring acreage in deep water; their finds helped prove the Gulf's worth to bigger brethren like Chevron, Devon Energy Corp. and Anadarko Petroleum Corp., which later bought these companies at a premium."[54] New generations of companies have started exploratory offshore businesses in the Gulf. Cobalt International Energy, for example, is already experiencing delays in its business because the "U.S. government moratorium on drilling would delay the planned drilling of an exploratory well in the Gulf by six months."[55]

IV. THE RIMS II MODEL CAN BE USED TO MEASURE THE ECONOMIC IMPACT OF THE MORATORIUM

As discussed in the previous section, onshore state and local economies benefit from offshore oil production by receiving compensation and economic benefit from providing goods and services to offshore oil and gas extraction sites. Onshore communities provide all manner of goods and services required by offshore oil and gas extraction. A variety of industries are involved in this effort: shipbuilders provide exploration vessels, permanent and movable platforms, and resupply vessels; steelworkers fashion the drilling machinery and specialized pipes required for offshore resource extraction; accountants and bankers provide financial services; and other onshore employees provide groceries, transportation, refining, and other duties. These onshore jobs, in turn, support other jobs and other industries (such as retail and hospitality establishments).

The statistical approach known as an "input-output" analysis can be used to measure the economic effects associated with a particular development project, or in this case a production stoppage. This approach, pioneered by Nobel Prize winner Wassily Leontif, has been refined by the U.S. Department of Commerce in the form of the Regional Input-Output Modelling System, or "RIMS II". The RIMS II model provides a variety of multipliers that measure how a plant shutdown or slowdown would affect local and regional economies, accounting for the elimination of jobs, decreases in wages, and the drain on potential government revenues. This analysis focuses on the negative direct *and* indirect effects associated with placing a moratorium on offshore drilling.

The RIMS II model is the standard method that governmental authorities use to evaluate the benefits associated with an economic development project. According to the Commerce Department, the RIMS II model has been used to evaluate the economic effects of many projects, including: opening or closing military bases, tourist expenditures, new energy facilities, opening or closing manufacturing plants, shopping malls, sports stadiums, and new airport or port facilities.[56] State and local governments have also used the RIMS II model to perform economic analyses.

> **"This analysis focuses on the negative direct and indirect effects associated with placing a moratorium on offshore drilling."**

[51] Kimberly Morin, GOP Senator introduces bill to terminate Obama's economy killing drilling moratorium, *The Examiner,* Jun. 17, 2010 (available at http://www.examiner.com/x-9100-Boston-Conservative-Independent-Examiner~y2010m6d17-GOP-Senators-introduce-bill-to-terminate-Obamas-economy-killing-drilling-moratorium).
[52] Id, citing the Wood MacKenzie Research and Consulting report. Section VI, Subsection F outlines some reasons for why my analysis predicts lower job loss projections.
[53] Angel Gonzalez, Stiffer Costs, Rules in Gulf Will Squeeze Smaller Players, The *Wall Street Journal,* Jun. 22, 2010 (available at http://online.wsj.com/article/SB10001424052748704256304575321104202428906.html) [hereinafter Stiffer Costs, Rules in Gulf].
[54] Id.
[55] Id.

The Bureau of Economic Analysis (BEA) RIMS II model provides multipliers that allow researchers to estimate the comprehensive effect on output, income, or employment as a result of changes to product outputs ("final-demand").[57]

Thus for these figures, I consider that the moratorium will prevent oil and natural gas from reaching the market and halt operation for 33 deepwater rigs.[58] According to the Louisiana Mid-Continent Oil and Gas Association (crediting Wood Mackenzie), 80,000 barrels of oil equivalent (both oil and natural gas) a day will not go to market as a result of the moratorium. [59] This equals 2.4 million barrels a month, and 14.6 million barrels during the six-month moratorium. I assume that the moratorium only lasts for six months, and that, after this point, the lost production will resume (thus this estimate may be conservative). This figure can be converted to a dollar value by applying the appropriate price.

Three final sets of demand multipliers are applied to the production loss estimate. First, BEA output multipliers measure the total decrease in economic activity—including the effect on all other industries—resulting from $1 of loss of industrial activity in a particular geographic region.[60] Next, BEA earnings multipliers measure the decrease in wages resulting from a $1 loss of industrial activity.[61] Finally, BEA employment multipliers measure the decrease in employment (in full-time equivalent jobs) associated with a $1,000,000 decrease in industrial activity.[62] For example, in Texas the oil and gas extraction output multiplier is 2.0721, the wage multiplier is 0.5085, and the employment multiplier is 8.2985. Thus, a loss of $1 million of oil and natural gas extraction translates into a loss of $2,072,100 in annual output, $508,500 in annual wage income, and approximately 8.3 additional full-time jobs for the year. The direct effect associated with the loss of oil and natural gas production varies by state. The same $1 million loss in production in Louisiana, for example, translates into a loss of $1,793,200 in output, $407,900 in wage income, and approximately 6.8 full-time jobs for the year.

The time period over which this loss is felt has been subject to much debate. In most cases, the BEA considers one year to be the horizon over which its multipliers will achieve full effect.[63] For our purposes, I assume that each BEA multiplier measures the changes that are expected to occur within one year.[64]

To determine the economic effect of a moratorium on deepwater oil and natural gas drilling, the BEA multipliers for "Oil and Natural Gas Extraction" are used (see Appendix Tables A2 and A3). The multipliers are available at the county level, but since I am interested in a broader range of effects, state and national multipliers are used in this paper. In the following sections, these multipliers are applied to production loss estimates to determine the state-by-state, and overall effects of the deepwater drilling moratorium on the Gulf economy.

V. PRESENT OFFSHORE OIL AND GAS RESERVE ESTIMATES

As stated above, to determine the economic effect of the moratorium on offshore oil and gas production on Gulf States, it is necessary to the estimate the lost production of oil and natural gas for each state as a result of the moratorium. The Louisiana Mid-Continent Oil and Gas Association (crediting Wood Mackenzie) stated in a recent report that 80,000 barrels of oil equivalent (both oil and natural gas) a day will not go

[56] See U.S. Department of Commerce, Bureau of Economic Analysis, Brief Description: Applications of RIMS II (available at http://www.bea.gov/bea/regional/rims/brfdesc.cfm).

[57] See Everett Ehrlich, Steven Landefeld & Betty Barker, Regional Multipliers: A User Handbook for the Regional Input-Output Modeling System (RIMS II), U.S. Department of Commerce, Third Edition, at 3 (Mar. 1997). ("If the user can estimate the change in final demand in the initially affected industry, the user can estimate the impact on output, earnings, or employment on the basis of final-demand multipliers.") [hereinafter Rims II Handbook].

[58] My calculations are based on the provisions of the original moratorium, and do not include additional provisions provided by the July 12th moratorium. As such, my estimates are conservative.

[59] Katherine Schmidt, Oil Industry Predicts Damage to Economy (80,000 bpd says Wood Mackenzie), *Investor Village,* Jun. 4, 2010 (available at http://www.investorvillage.com/smbd.asp?mb=14535&mid=9098568&pt=msg) [hereinafter Oil Industry Predicts Damage].

[60] RIMS II Handbook, supra, at 3, ("In this [final demand output multiplier] table, each column entry indicates the change in output in each row industry that results from a $1 change in final demand in the column industry. The impact on each row industry is calculated by multiplying the final-demand change in the column industry by the multiplier for each row.") [hereinafter Rims II Handbook].

[61] See Id. ("In this [final demand earnings multiplier] table, each column entry indicates the change in earnings in each row industry that results from a $1 change in final demand in the column industry. The impact on each row industry is calculated by multiplying the final-demand change in the column industry by the multiplier for each row.").

[62] See Id. at 4 ("In the final-demand employment multiplier table, each column entry indicates the change in employment in each row industry that results from a $1 million change in final demand in the column industry. The impact on each row industry is calculated by multiplying the final-demand change in the column industry by the multiplier for each row.").

[63] RIMS II Handbook, supra, at 8 ("RIMS II, like all I-O models, is a "static equilibrium" model, so impacts calculated with RIMS II have no specific time dimension. However, because the model is based on annual data, it is customary to assume that the impacts occur in 1 year. For many situations, this assumption is reasonable.").

[64] Id., ("RIMS II, like all I-O models, is a 'static equilibrium' model, so impacts calculated with RIMS II have no specific time dimension. However, because the model is based on annual data, it is customary to assume that the impacts occur in 1 year.").

to market as a result of the moratorium. This equals 2.4 million barrels a month, and 14.6 million barrels during the six – month moratorium.[65]

I take a two-step approach to estimate state-by-state production in the Gulf of Mexico (GOM). First, GOM production figures are apportioned to the GOM coastline states by assuming that a state's share of oil and gas reserves (and hence the benefits of utilizing those reserves) is proportional to its share of the GOM production. Then, the dollar value of state production is estimated by applying the current prices of oil and gas to each state's share.

It is reasonable to assume that a state's production is tied to its available reserves, and by association the state's proximity to oil. The analysis of economic impact, therefore, hypothesizes that the economic benefits associated with offshore oil and natural gas production accrue onshore firstly in the local communities that provide the most convenient labor, materials, and support services for offshore production. Thus, to apportion total production to the GOM states, I use each state's share of the total oil and natural gas reserves in the GOM. In a previous paper, I calculated each state's share of total oil and natural gas reserves, and I use those estimates to apportion production in the current analysis.[66] Table 2 presents the result of this calculation. Louisiana stands to lose the most in terms of production, followed by Texas, Alabama, and Mississippi.

To quantify the monetary loss, I use the U.S. Energy Information Administration's (EIA) latest price forecasts from the Short Term Energy Outlook July 7, 2010. The report indicates that for the second half of 2010, the average price of oil will be $79 per barrel. The value of each state's production is calculated as its share of available GOM offshore oil production times $79.00 per barrel.[67] At this price, the production losses apportioned to coastal states have the dollar values reported in Table 2 below.

TABLE 2

Estimated Six-Month Production Loss Of Oil Equivalent Barrels In the GOM

State	Mbbl	$ Millions
Texas	3,801	$300
Alabama	1,162	$92
Mississippi	965	$76
Louisiana	8,704	$688
Total	**14,632**	**$1,156**

Sources: The Louisiana Mid-Continent Oil and Gas Association (citing Wood Mackenzie); U.S. Energy Information Administration, Short Term Energy Outlook, July 2010; Joseph R. Mason, The Economic Contribution of Increased Offshore Oil Exploration and Production to Regional and National Economies, American Energy Alliance (Feb. 2009).

VI. DECREASED INVESTMENTS IN OFFSHORE OIL AND GAS PRODUCTION WILL CAUSE SUBSTANTIAL LOSSES IN WAGES AND, EMPLOYMENT, AND WILL HAVE PROFOUND EFFECTS ON COMMUNITIES THROUGHOUT THE GULF

In the following sections, the BEA multipliers for "Oil and Natural Gas Extraction" are applied to the previously discussed estimates of production loss (see Appendix Tables A2 and A3). Section A explains the effect of the moratorium on both the Gulf states and total U.S. economic output. Section B quantifies the effect of the moratorium on employment (a particularly salient topic given the current unemployment woes of many Americans). Section C explains the negative impact of the moratorium on wages. Section D explains the negative impact of a moratorium on local, state, and federal tax revenues. These analyses paint a bleak picture of the economic impact of the moratorium. Further, as is shown in Section E, the analyses do not even consider a

[65] Oil Industry Predicts Damage, supra.

[66] In a previous paper, I apportioned OCS Planning Area reserves—and the local economic benefits associated with exploiting those reserves—by each state's share of the ocean coastline bordering an OCS Planning Area. Based on that allocation, the percentage of loss in this study allocated each state would be: LA: 59%; MS: 6%; AL: 7%; TX: 25%; FL: .01%. See Joseph R. Mason, The Economic Contribution of Increased Offshore Oil Exploration and Production to Regional and National Economies, American Energy Alliance, Feb. 2009.

[67] U.S Energy Information Administration (EIA), *Short Term Energy Outlook*, July 2010.

number of loss factors, such as rigs not coming back to the GOM after leaving or the loss of economic benefits as a result of investment in exploration.

In no way are these figures meant to be definitive. Instead, the estimates presented represent a reasonable approach to assessing the economic impact of a deepwater drilling moratorium.

A. The Six-Month Moratorium on Offshore Drilling Activity Will Cost More than $2.7 Billion in Economic Activity Nationwide, and $2.1 Billion in Gulf Communities

The broadest measure of the incremental effect of the moratorium is the effect on total economic output. As discussed earlier, GDP and GSP represent the two main measures of output. The BEA's final demand output multipliers can be used to perform a RIMS II analyses. The multipliers are applied to the production estimates in Table 2 to determine the expected total decrease in output as a result of the moratorium. The production loss estimate is used to measure the change in demand. In total, the loss in output can be expected to over $2.1 billion in the Gulf states, $2.7 billion nationwide.

Using the production estimates from Table 2 and the BEA multipliers in Table A2, the estimated decrease in economic output based on the estimated oil and natural gas production is presented in Table 3. It is important to note, that the multipliers in this table only provide the decrease in output that *is generated at the same location as the decrease in production.* As an integrated economy, however, output in one state is tied to output in other states. For example, the oil and natural gas produced in Louisiana may be used as an input to production in Illinois or Pennsylvania. These effects may be considered "spill-over" effects because they spread from one location to another location. Using the individual multiplier for Louisiana would thus under-report the total loss associated with a moratorium in Louisiana. Comparing the total U.S. result to the additive total of the output decreases in the individual Gulf states, suggests that there are over $659 million dollars in lost spillover effects from the moratorium.

TABLE 3

Decrease in Output From the Six–Month Moratorium on Deepwater Drilling

State	GSP/GDP ($ Mil)
Texas	-$622
Alabama	-$138
Mississippi	-$117
Louisiana	-$1,233
Total GOM	**-$2,110**
United States	**-$2,769**
Spillover Effects	**-$659**

Source: Regional Input-Output Modeling System (RIMS II), Regional Product Division, Bureau of Economic Analysis, U.S. Commerce Department; Production estimates from Table 2; Navigant Economics, LLC Calculations.

B. The Six-Month Moratorium on Offshore Drilling Could Cost Thousands of Jobs

The moratorium on deepwater oil drilling would also result in the loss of thousands of jobs, not only on the various oil rigs, but also in associated industries. The Louisiana Department of Economic Development estimates a loss of 10,000 jobs within a few months after the moratorium.[68] Moreover, they predict that the state "risks losing more than 20,000 existing and potential new jobs during a 12 to 18 month period." [69] The analysis below offers an alternative estimate for employment losses based on the RIMS II model. My results are slightly more conservative, because I only estimate the period of loss to be six months. As before, effects are calculated using estimated state-level production losses.

1. BEA Multiplier Analysis

As presented above, this analysis estimates the total economic effects associated with stopping deepwater drilling. Using the BEA's final-demand employment multipliers (denominated in job-years per $1 million change in final demand) in Table A2 and the estimated production loss in Table 1 yields the expected losses in employment in Table 4. The decrease in employment is estimated to be 8,169 full-time jobs in the GOM. Louisiana alone stands to lose 4,719 full time jobs. Nationwide, there will be an estimated loss of 12,046 jobs.

[68] Just the Facts, supra.
[69] Id.

TABLE 4

Decrease in Employment from the Six–Month Moratorium on Deepwater Drilling

State	Jobs Lost
Texas	-2,492
Alabama	-527
Mississippi	-432
Louisiana	-4,719
Total GOM	**-8,169**
United States	**-12,046**
Spillover Effects	**-3,877**

Source: Regional Input-Output Modeling System (RIMS II), Regional Product Division, Bureau of Economic Analysis, U.S. Commerce Department; Production estimates from Table 2; Navigant Economics Calculations.

These projections are lower than those presented by other studies because I estimate the period of new production loss to be only six months. However, if we were to extend the loss in new production in our model to the 18 months assumed by other sources, we would see a loss of 36,137 jobs nationally, 24,532 jobs lost in the GOM, and 14,156 jobs lost in Louisiana. These estimations are more in line with the projections presented in Section III by the Louisiana Department of Economic Development and Wood Mackenzie Consulting.

The state-level BEA multipliers do not account for decreases in employment outside of the state. As a result, jobs lost in one state because of the deepwater drilling being halted in another state are omitted from the totals. Again, comparing the nationwide jobs lost to the additive total of the state job losses, yields a spillover effect of 3,877 jobs lost for the year spanning the moratorium period.

2. Evaluation of the Types of Employment Loss

The BEA data can also be used to analyze the types of employment that would be lost by a moratorium on deepwater drilling. The production stoppage throughout the nation will result in job loss in the ancillary industries that support the oil industry, and cause instability for thousands of Americans already coping with a turbulent economic climate. Further, oil producers will reduce their investment in local economies as rigs are moved or shut down.

Oil companies have a great incentive to invest in local communities to improve the quality of life for their employees and attract talent to their offices and rigs. Shell, for example, started a Center for Petroleum Workforce Development at their training center in 2006. The joint venture between the state of Louisiana, Louisiana State University and Shell, made the center "available to the entire industry" in hopes of encouraging oil and gas employees from around the world to develop their skills.[70] As production decreases and rigs and offices are shut down or moved, the incentive for investments such as those spurred on by Shell will evaporate.

For this analysis, the losses are broken down using specific BEA multipliers for each industry (see Table A3), that determine which industries will stand to lose the most from the moratorium on deepwater drilling. Table 5 reports the expected total losses in employment.

TABLE 5

Decrease in Employment from the Six–Month Moratorium on Deepwater Drilling, by Sector

Job Sector	Texas	Alabama	Mississippi	Louisiana	Total GOM	United States	Spillover Effects
Agriculture, forestry, fishing, and hunting	-24	-3	-3	-29	**-60**	**-185**	**-125**
Mining	-597	-168	-139	-1,230	**-2,133**	**-2,390**	**-257**
Utilities	-10	-2	-2	-24	**-39**	**-49**	**-10**
Construction	-15	-3	-2	-28	**-49**	**-77**	**-28**
Manufacturing	-96	-24	-19	-141	**-279**	**-707**	**-428**
Wholesale trade	-67	-15	-10	-130	**-223**	**-353**	**-130**
Retail trade	-254	-54	-48	-510	**-865**	**-1,194**	**-329**
Transportation and warehousing	-77	-13	-11	-134	**-236**	**-427**	**-192**
Information	-35	-6	-4	-58	**-103**	**-208**	**-105**

[70] "In 2006, Louisiana announced the creation of the Center for Petroleum Workforce Development at Shell Oil Company's Robert, La., training center – the result of a joint venture agreement among the State of Louisiana, Louisiana State University and Shell by Developing the center and making it available to the entire industry, the replacement rate of trained employees will increase. The center's training concept is to have oil companies hire and send employees from all over the world to the Shell/LSU facility to obtain the highest training level possible. This process will ensure a supply of highly trained and skilled personnel. It will also help develop a long-lasting, satisfying career path for workers in the industry." See Oil & Gas Industry of Louisiana: Exploration and Production, Louisiana Economic Development (LED), at 3.

TABLE 5 *(cont.)*

Job Sector	Texas	Alabama	Mississippi	Louisiana	Total GOM	United States	Spillover Effects
Finance and insurance	-130	-19	-14	-150	**-313**	**-639**	**-326**
Real estate and rental and leasing	-178	-26	-16	-317	**-537**	**-819**	**-281**
Professional, scientific, and technical services	-148	-24	-16	-233	**-421**	**-759**	**-338**
Management of companies and enterprises	-23	-5	-7	-86	**-121**	**-194**	**-73**
Administrative and waste management services	-135	-22	-13	-207	**-377**	**-706**	**-329**
Educational services	-74	-19	-17	-150	**-260**	**-321**	**-60**
Health care and social assistance	-277	-56	-50	-591	**-974**	**-1,270**	**-296**
Arts, entertainment, and recreation	-34	-4	-4	-68	**-110**	**-243**	**-133**
Accommodation and food services	-169	-36	-33	-352	**-590**	**-825**	**-234**
Other services	-124	-24	-20	-252	**-420**	**-610**	**-190**
Households	-24	-3	-3	-29	**-59**	**-71**	**-12**
Total	**-2,492**	**-527**	**-432**	**-4,719**	**-8,169**	**-12,046**	**-3,876**

Source: Regional Input-Output Modeling System (RIMS II), Regional Product Division, Bureau of Economic Analysis, U.S. Commerce Department; Production estimates from Table 2; Navigant Economics Calculations.

These tables give a sense of the distribution of the jobs lost from the moratorium. A large portion of lost positions (approximately 38 percent) would be lost in high-skill fields, such as health care, real estate, professional services, manufacturing, administration, finance, education, the arts, information, and management. A sizable portion of job loss will obviously occur in mining (which includes oil and gas drilling) with these jobs accounting for over 26 percent of the total jobs lost in the Gulf area, and about 20 percent nationally.[71]

C. The Six-Month Moratorium on Offshore Drilling Will Cause Massive Wage Loss for Workers Already Hit by Recession

The moratorium will also cause a huge loss in wages for an already distressed workforce. Some analysts predict that this could mount to $65 to $135 million in wage losses per month.[72] The BEA multipliers allow an analysis of the effect of a moratorium on deepwater drilling on wages in affected states.

To estimate lost wages, the BEA's final demand earnings (wage) multipliers are applied to the production estimates. Table 6 presents the results. As the data indicates, the moratorium will result in well over $487 million in lost wages in Gulf states, over $707 million nationwide. The previously discussed, caveats regarding spill-over effects remain true for this wage analysis, with spill-over effects of $219 million in wages.

TABLE 6

Decrease in Earnings from the Six–Month Moratorium on Deepwater Drilling

State	$ Millions
Texas	-$153
Alabama	-$29
Mississippi	-$25
Louisiana	-$280
Total GOM	**-$487**
United States	**-$707**
Spillover Effects	**-$219**

Source: Regional Input-Output Modeling System (RIMS II), Regional Product Division, Bureau of Economic Analysis, U.S. Commerce Department; Production estimates from Table 2; Navigant Economics Calculations.

[71] For a full listing of the jobs included in "Mining", see U.S. Census Bureau's 2007 NAICS Codes and Titles, (available at http://www.census.gov/naics/2007/NAICOD07.HTM).

[72] Gary Perilloux, Groups struggle to assess oil's impact, *WBRZ 2: The Advocate*, Jun. 29, 2010, [hereinafter Groups Struggle to Assess Oil's Impact].

D. The Moratorium will Cause the Loss of Millions of Dollars in Taxes and Other Public Revenues to Local, State, and Federal Governments

Decreased output, fewer jobs, and lost wages translate into lower tax collections and decreases in public revenues. The present analysis applies a broad measure of the total tax revenues (from all sources) that federal, state, and local governments will lose from the moratorium on deepwater drilling. The analysis, again using production loss, estimates that $97 million will be lost in state and local taxes.[73] This will translate into reduced investment in the local economy, schools, hospitals, and other necessary public services. Again, even absent current economic conditions, cash-strapped communities benefit significantly from the income that oil and natural gas production brings to the table. Taking away this income source could potentially deny communities access to resources necessary to provide important community projects.

In order to estimate the decrease in state and local tax revenue attributable to a moratorium on deepwater oil drilling, the analysis follows the approach outlined by the Federal Reserve Bank of Boston to determine annual state and local tax burdens as a share of GSP (see Table A4).[74] For each state and the District of Columbia, the state and local tax burden can be calculated by dividing annual state and local tax revenue by annual GSP. Data for state and local tax revenues are released by the U.S. Census Bureau annually with a two year lag. As such, the state and local tax burden calculations are based on the most recent available fiscal year, 2008.[75] Those data produce the average state and local tax burden in 2008 in each state. The effective tax burdens are applied to the production estimates. Table 7 presents the estimated losses in tax revenues. As before, the losses in tax revenues presented have the same caveats regarding "spill-over" revenues.[76] The estimates thus represent a lower bound on potential state and local tax revenues lost from a moratorium on deepwater oil drilling.

TABLE 7
Decrease in State and Local Tax Revenues from the Six–Month Moratorium on Deepwater Drilling

State	Decrease in State and Local Tax Revenues
Texas	-$22,843,972
Alabama	-$7,247,044
Mississippi	-$8,418,401
Louisiana	-$59,356,236
Total GOM	**-$97,865,652**

Sources: U.S. Census Bureau; Bureau of Economic Analysis; Regional Input-Output Modeling System (RIMS II), Regional Product Division, Bureau of Economic Analysis, U.S. Commerce Department; Production estimates from Table 2; Navigant Economics Calculations

The decrease in economic activity resulting from a moratorium on deepwater oil drilling will also produce significant losses in federal tax revenues. According to the IRS, the average effective tax rate in the United States in FY2008 was 18.98 percent of GSP.[77] Applying this rate to the total oil and natural gas production loss ($1.16 billion) suggests that U.S. federal tax receipts would decrease by $219 million.[78]

In total, therefore, the moratorium can result in a loss of nearly $317 million. Dividing the loss equally among all U.S. taxpayers[79] yields an immediate cost of about $2.35 per taxpayer. These amounts represent net tax effects, and though they may seem modest when viewed on a national basis, they add an unnecessary burden to an already strained tax base, especially when focused on state and community tax revenues that are necessary to pay for local services.

[73] Note that this analysis is conservative because it does not consider the state and local taxes produced from "spill-over" effects. These tax revenues cannot be accurately measured because spill-over output cannot be attributed to particular states. Because spill-over output is significant, however, my estimate significantly understates the total incremental state and local taxes that would be produced annually.
[74] Matthew Nagowski, Measures of State and Local Tax Burden, New England Public Policy Center, Federal Reserve Bank of Boston (Jul. 13, 2006), () (available at: http://www.bos.frb.org/economic/neppc/memos/2006/nagowski071306.pdf).
[75] Data pertain to period July 1, 2005 – June 30, 2006. U.S. Census Bureau, Federal State and Local Governments, State and Local Government Finances, 2005-2006 Estimate, (available at: http://www.census.gov/govs/www/06censustechdoc.html#fiscalyr).
[76] It is impossible to quantify these benefits because state and local taxes differ from state to state and because the BEA does not provide a means to allocate the spill-over revenues to particular states. To be conservative, the analysis estimates only the revenues that can be accurately assigned and measured.
[77] Department of the Treasury, Internal Revenue Service, SOI Tax Stats.- IRS Data Book: 2008, Table 5, (available at http://www.irs.gov/taxstats/article/0,,id=168593,00.html).
[78] GNO Inc. estimated that the moratorium "could cut state and local tax revenue by more $700 million over four years, accruing at a rate of $8 million to $15 million a month." See Groups Struggle to Assess Oil's Impact, supra.
[79] IRS, Tax Stats at a Glance, (available at http://www.irs.gov/taxstats/article/0,,id=102886,00.html).

E. Communities Nationwide will Suffer from Decreased Health, Education, Welfare, and Social Services

Communities around the Gulf and throughout the country will also suffer negative effects associated with decreased economic activity as a result of a moratorium. Those effects flow from the decrease in high-wage, high-skilled employment. For example, a ban on drilling may induce related industries, such as ship builders, to shut down operations. The loss of employees in these industries, in turn, would decrease community demand for health care, education, and other community services that are available to *all* residents (whether they are employed by the drilling facilities or not). Additionally, the resulting loss of tax revenues could cause a reduction in the availability of these services. The oil and gas industry represents a significant portion of the Gulf states' tax revenue. In 2006, "the oil and gas industry paid more than 14 percent of total state taxes, licenses and fees collected by the state of Louisiana…[which represents] a substantial portion of Louisiana's budget."[80]

The estimated decrease in employment in the health and education is but one indicator of the tertiary effects associated with the moratorium. As indicated in Table 5, a stoppage in oil and natural gas production would result in the loss of 974 health care providers and 260 teachers in the GOM states. Nationwide there would be a reduction of 1,270 health care providers and 321 teachers. This indicates that the spill-over effects of employments loss would be 296 health care providers and 60 teachers to states outside of the GOM. While employment and wage losses may seem palatable on a national scale, many of the job losses would be concentrated in small coastal towns like Port Fourchon, Louisiana (which is home to substantial resources serving Gulf of Mexico offshore production).[81] Indeed, in some communities the decrease in demand associated with lost jobs tied to offshore drilling moratorium may mean the difference between having a local hospital and school or not.

Coastal cities like Port Fourchon experienced significant growth in the last three decades tied to their central role in offshore oil and gas production.[82] Port Fourchon alone services half of all drilling rigs presently operating in the Gulf of Mexico.[83] Furthermore, current plans call for more than half of all new deep water drilling platforms in the Eastern and Central Gulf of Mexico to use towns like Port Fourchon as their service base.[84] Given the concentration of the deep water Gulf of Mexico operations at coastal communities, it is reasonable that the loss to this community from the moratorium will be substantial. Similar small communities stand to lose significantly as a result of the moratorium.

F. The Current Analysis is a Conservative Estimate of Loss

The current analysis presents a conservative estimate of economic loss caused by the moratorium. Several scenarios could cause actual losses to substantially exceed those offered here.

First, the current analysis considers the loss to continue only for six months, followed by a return to normal operations. It is possible, however, that the moratorium and/or its effects could last up to a year and half.[85] Until a final decision is made by the administration and the courts, it is hard to predict the scope of the losses for the Gulf region. Thus, the losses could in fact increase by a factor of 2 or 3.

Second, as stated earlier, the initial investment stage in oil and natural gas extraction produces many economic benefits. It is conceivable that some of these benefits will be deferred or simply lost as projects are delayed or moved.[86] As I discussed earlier the effects could be particularly detrimental towards smaller oil

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[80] Just the Facts, supra.

[81] In fact, the town houses one of the rigs that is affected by the moratorium. See Joe Nocera, Moratorium Won't Reduce Drilling Risks, Jun. 25, 2010, *The New York Times,* (available at http://www.nytimes.com/2010/06/26/business/26nocera.html); For a discussion of Port Fourchon, see Loren C. Scott Associates, The Economic Impacts of Port Fourchon on the National and Houma MSA Economies, Apr. 2008, (available at http://www.portfourchon.com/site100-01/1001757/docs/port_fourchon_economic_impact_study.pdf).

[82] The Greater Lafource Port Commission was first organized in 1960 (the surrounding community had a population of 55,381) See Greater Lafourche Port Commission, About Us, (available at http://www.portfourchon.com/overview.cfm); U.S. Census Bureau, Louisiana: Population of Counties by Decennial Census: 1900 to 1990, (available at http://www.census.gov/population/cencounts/la190090.txt) [hereinafter Historical Census Data].

[83] See LA1 Coalition, Facts and Figures: Port Fourchon, (available at http://www.la1coalition.org/facts.html). The executive direct of Port Fourchon estimates that the port "services 90 percent of all the deepwater activity in the Gulf of Mexico, and all 33 of the rigs" that fall under the moratorium. Louisiana Port Operator Pleased With Dismissal of Drilling Moratorium, FOX News, Jun. 23, 2010 (available at http://www.foxnews.com/story/0,2933,595184,00.html).

[84] See id. Port Fourchon has seen an increase of their population to 95,554 in 2006. Overall, between 1960 and 2006, the Lafourche Parrish population grew by 72.5 percent whereas the State of Louisiana population grew 31.6 percent. See U.S. Census Bureau, Quickfacts, Lafourche Parrish, Louisiana, (available at http://quickfacts.census.gov/qfd/states/22/22057.html); Historical Census Data, supra, at note 73.

[85] A study by Morgan Stanley, for example, appears "confident that the ban will meaningfully exceed 6-months" and of the affected floaters, at least "a portion of the 35 floaters will leave the region, as operators declare force majeure." The study continues that "the legislative process could take 9-18 months [and that] it could take even longer for rigs to come back into the region after the ban is lifted." Global Oil Services, Drilling & Equipment, Morgan Stanley, Jun. 1, 2010, 1 (available at http://www.offshoremarine.org/images/stories/GOM_Drilling_Moratorium_06_01_10.pdf).

[86] Morgan Stanley "expect[s] a major supply/demand imbalance as the 35 GOM floaters attempt to relocate internationally, while an additional 30 un-contracted new builds exacerbate the issue. Subsea equipment companies are likely to feel the after-burn, as their orders are a direct function of deepwater drilling." See Id.

companies.[87] ATP Oil and Gas Corp., for example, "expected to see its 2010 production double to at least 12 million barrels of oil and gas but has now dropped its guidance to between 9 million and 10 million."[88] It is challenging, however, to quantify this effect coherently across the whole industry. Thus I have not included investment loss in my analysis. This means that I have under-reported the loss felt by communities in the Gulf and nationwide.

Third, if the end result of the moratorium is to place severe restrictions on offshore drilling operations for the long-term, costs could increase to operators significantly. This could lead to decreased operations, increased oil and natural gas prices, and the movement of operations to cheaper locations. This would again impose significant economic hardship on communities throughout the Gulf.

Last, refining also has significant benefits to the economies of the Gulf and the nation. Again, it is difficult to determine the effect of the moratorium on refining capacity. It is reasonable to assume that some capacity will be reduced as a result of stagnant oil and gas extraction, which would further add to the economic hardship caused by the moratorium.

G. Worst Case Scenario Analysis

One potential outcome of the moratorium is that all production in the Gulf of Mexico stops because offshore drilling is deemed too dangerous. Although unlikely, repeating the analysis with this assumption can be a useful exercise by providing an idea of the total amount of output, employment, wages, and tax revenue at stake.

This analysis uses data from the U.S. Department of the Interior, U.S. Department of Energy, the U.S. Census Bureau, and the U.S. Treasury Department to estimate the total decrease in output, employment, wages, and public revenues to the Gulf States and nationwide.

The relevant offshore oil and gas production data is again the starting point for the analysis. According to the U.S. Department of the Interior Office of Offshore Energy & Minerals Management (MMS).[89] the average monthly OCS offshore production of oil and natural gas in the GOM from January 2001 through November 2009 was over 42 million barrels of oil and 295 million Mcf (Thousand Cubic Feet) of natural gas. According to a recent report, 80 percent of GOM oil production and 45 percent of natural gas production comes from deepwater operations, and is therefore affected by the moratorium.[90] Applying these percentages to the total production figures, 34 million barrels of oil and 133 million Mcf of natural gas a month are at risk from the moratorium in the entire GOM region. Thus the total annual production at risk from the moratorium is around 410 million barrels of oil and 1.6 billion Mcf of natural gas.

These figures are apportioned to the Gulf States in the same manner as before. Dollar values are also calculated similarly, using the EIA's latest inflation-adjusted energy price forecasts from the *Short Term Energy Outlook July 2010*. The report indicates that for the second half of 2010 the average prices of oil will $79.00 per barrel and the average price of natural gas is $4.68 per MMBtu.[91] The value of each state's production is calculated as the sum of (1) its share of available GOM offshore oil production times $79.00 per barrel and (2) its share of available GOM natural gas production times $4.68 per thousand cubic feet.

Table 8 presents the results of the analysis:[92]

Table 8

Worst Case Scenario Losses

	Total GOM	Spillover Effects	Total U.S.
Output ($ Mil)	-$72,595	-$22,718	-$95,313
Employment (Jobs)	-285,378	-129,320	-414,698
Wages ($ Mil)	-$16,794	-$7,530	-$24,324
State & Local Tax Revenues ($ Mil)	-$2,972	N/A	N/A
Federal Tax Revenues ($ Mil)	N/A	N/A	$7,557

Note: Losses are expected to accrue over 12 months following the end of production.

As the results clearly illustrate, the loss would be astounding. Again, such a scenario is highly unlikely, but the analysis demonstrates the value of GOM deepwater drilling to Gulf communities and the nation.

VII. SUMMARY AND CONCLUSIONS

In this paper, I estimate the net local and national economic effects that could result from a six-month moratorium on offshore drilling - which currently is the White House's approach to the BP oil crisis in the Gulf of Mexico. I set out to provide the framework to assess the cost of such an action. The resulting

[87] Stiffer Costs, Rules in Gulf, supra.
[88] Id.
[89] U.S. Department of the Interior, Offshore Energy & Minerals Management OCS Oil and Gas Production, Jan. 22, 2010, (available at http://www.mms.gov/stats/OCSproduction.htm)
[90] Id.
[91] U.S. Energy Information Administration, Short Term Energy Outlook, July 2010.
[92] Florida is included in the GOM in this calculation.

analysis indicates that a six-month moratorium on offshore drilling will greatly restrict economic activity, potentially causing job loss, decreased aggregate wages, and a loss of public revenues for the foreseeable future.

The presidential moratorium will cost approximately $2.1 billion in economic loss to the Gulf states ($2.7 billion nationally), with some $487 millions to be expected in lost wages to employees ($707 million nationally) and in the neighborhood of eight-thousand lost jobs (12 thousand nationally), many in human capital intensive professional career fields. One key finding is the assessment of spill-over effects outside the affected regions in the Gulf of Mexico. I estimate a potential loss of $659 million in output, around four-thousand in jobs, and $219 million in lost wages due to spill-over effects that could permeate outside the affected states. The potential economic hardship will result in the loss of approximately $219 million in federal tax revenues and $98 million in state and local tax revenue. The lost revenues will directly affect the infrastructure of the region, including schools, health centers, and investment projects, substantially reducing the quality of life in local communities and nationwide. This potential loss comes in the wake of the continuing recession and financial crisis.

In summary, the current White House administration should consider a wide range of economic costs before enforcing the six-month moratorium on exploratory drilling. A blanket moratorium on deepwater drilling will cause economic hardship with substantial negative effects on jobs, wages, taxes, and other public revenues, adding to the struggles of local communities mired in recession. Further, the estimates in this paper may vastly underestimate the effects of the policy. For example, it is conceivable that oil rigs that leave the Gulf region because of the moratorium would not return after six months (Morgan Stanley believes the effects could continue for up to 12 to 18 months).

In closing, the present analysis is only meant to be a starting point for discussing the necessity that a cost benefit analysis should have on enacting the current moratorium on offshore drilling specifically, and future policies toward offshore drilling generally. Policy makers must consider unintended consequences before acting on imperfect information. The figures and tables that I produce are in no way an exact estimate of the economic effects of a six-month moratorium. Certain data limitations do not allow for a more refined analysis at this time, but the framework presented here provides the possibility for further study. Although there is likely to be a debate on the parameters and estimates put forth in my analysis, the point remains that economic costs need to be considered and investigated when evaluating the moratorium. Failing to weigh the costs of a policy decision against the potential benefits can cause more damage than the original safety concern itself.

APPENDIX A

Table A1

Distribution of Operating U.S. Oil Refining Capacity by State, 2008

State	Present Refining Capacity	
	Per Calendar Day (BBL)	Per Year (MBBL)
Alabama	124,600	45
Alaska	375,280	137
Arkansas	77500	28
California	2,007,188	733
Colorado	94,000	34
Delaware	182,200	67
Hawaii	147,500	54
Illinois	915,600	334
Indiana	433,000	158
Kansas	305,900	112
Kentucky	226,000	82
Louisiana	2,951,383	1,077
Michigan	102,000	37
Minnesota	362,150	132
Mississippi	364,000	133
Montana	187,100	68
Nevada	2,000	1
New Jersey	623,000	227
New Mexico	121,600	44
North Dakota	58,000	21
Ohio	515,200	188
Oklahoma	520,400	190
Pennsylvania	773,000	282
Tennessee	180,000	66
Texas	4,509,196	1,646
Utah	167,700	61
Virginia	63,650	23
Washington	627,850	229
West Virginia	20,000	7
Wisconsin	34,300	13
Wyoming	154,500	56
U.S. Total	17,225,797	6,287

Source: U.S. Energy Information Administration, Capacity of Operable Petroleum Refineries by State as of January 1, 2008.

APPENDIX A (continued)

Table A2
RIMS II Multipliers: Final Demand (2006)

State	Output	Earning	Employment
Alabama	1.5047	0.3206	5.7384
Louisiana	1.7932	0.4079	6.8625
Mississippi	1.5301	0.3263	5.6673
Texas	2.0721	0.5085	8.2985
United States	2.3938	0.6109	10.4152

Source: Regional Input-Output Modeling System (RIMS II), Regional Product Division, Bureau of Economic Analysis, U.S. Commerce Department.

Table A3
RIMS II Multipliers: Employment by Sector (2006)

Sector	Alabama	Mississippi	Louisiana	Texas	United States
Agriculture, forestry, fishing, and hunting	0.0313	0.0435	0.0421	0.0815	0.1599
Mining	1.8284	1.8238	1.7882	1.9869	2.0662
Utilities*	0.0244	0.0285	0.035	0.0344	0.0426
Construction	0.0346	0.0323	0.0412	0.0508	0.0666
Manufacturing	0.2602	0.2494	0.2045	0.3193	0.6117
Wholesale trade	0.1647	0.1359	0.1888	0.2245	0.3051
Retail trade	0.5851	0.6239	0.7415	0.8462	1.0323
Transportation and warehousing*	0.142	0.1487	0.1948	0.2573	0.3694
Information	0.0655	0.0469	0.0847	0.1177	0.1797
Finance and insurance	0.208	0.1857	0.2178	0.4321	0.5521
Real estate and rental and leasing	0.2845	0.2139	0.4616	0.5912	0.7079
Professional, scientific, and technical services	0.2624	0.2134	0.3383	0.4923	0.656
Management of companies and enterprises	0.0591	0.0861	0.1246	0.0777	0.1679
Administrative and waste management services	0.2424	0.1755	0.3006	0.449	0.6104
Educational services	0.202	0.2285	0.2184	0.2469	0.2773
Health care and social assistance	0.6093	0.658	0.8594	0.9212	1.0978
Arts, entertainment, and recreation	0.048	0.0512	0.0992	0.1122	0.2101
Accommodation and food services	0.3936	0.4329	0.5124	0.5629	0.7132
Other services*	0.2601	0.2561	0.3667	0.4139	0.5272
Households	0.0329	0.0334	0.0427	0.0805	0.0617

Source: Regional Input-Output Modeling System (RIMS II), Regional Product Division, Bureau of Economic Analysis, U.S. Commerce Department.

Table A4
State Tax Burden, 2008

State	State and Local Taxes	Gross State Product	Tax Burden
Alabama	8,920,105,000	170,014,000,000	5.20%
Louisiana	10,697,358,000	222,218,000,000	4.80%
Mississippi	6,626,204,000	91,782,000,000	7.20%
Texas	44,919,866,000	1,223,511,000,000	3.70%

Source: U.S. Census Bureau, Bureau of Economic Analysis

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Dr. Mason's consulting practice provides firms with advice on financial, political, and legal risks in banking and finance. Dr. Mason has consulted on issues ranging from mortgage, home equity loan, home equity line of credit, auto, and credit card servicing, and securitization, to discrimination and disparate impact in consumer lending and insurance pricing, valuing distressed securities, the investor recoveries and efficient liquidations of bankrupt firms, and economic valuations of complex investment and lending arrangements involving asset-backed securities, collateralized debt obligations, and hedge funds. In litigation, he regularly serves as testifying or non-testifying expert on matters related to a wide variety of financial market-related claims. Dr. Mason has consulted for and advised investment firms, corporations, and research institutions, including The Conference Board, Inc., Coventry First, Deloitte, Fannie Mae, the Federal Deposit Insurance Corporation, the Federal Reserve Bank of Philadelphia, The Group of Thirty, Pricewaterhouse-Coopers, and The World Bank Group.

Dr. Mason's academic research focuses primarily on investigating liquidity in thinly-traded assets and illiquid market conditions. Current academic research projects analyze default risk, including both immediate and cross-default risk, and default resolution costs in the contexts of asset-backed securities, in systemic and non-systemic environments, as well as the efficacy of bailout and resolution policies through the history of financial markets. His research and economic commentary has received hundreds of national and international press citations in publications such as the *Wall Street Journal, New York Times, Washington Times, The Economist, Financial Times, Barrons, Business Week, die Zeit, Neue Zürcher Zeitung, Financial Times-Germany, Los Echos, Forbes, Fortune, Portfolio Magazine, Bloomberg Magazine, American Banker*, and on press syndicates such as Associated Press, Reuters, Bloomberg, KnightRidder, and MarketWatch-Dow Jones Newswire.

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