August 2004

Louisiana Energy Topic

Department of Natural Resources Technology Assessment Division
A Supplement to LOUISIANA ENERGY FACTS on Subjects of Special Interest

DECONSTRUCTING THE MEANING OF RIG COUNT

by
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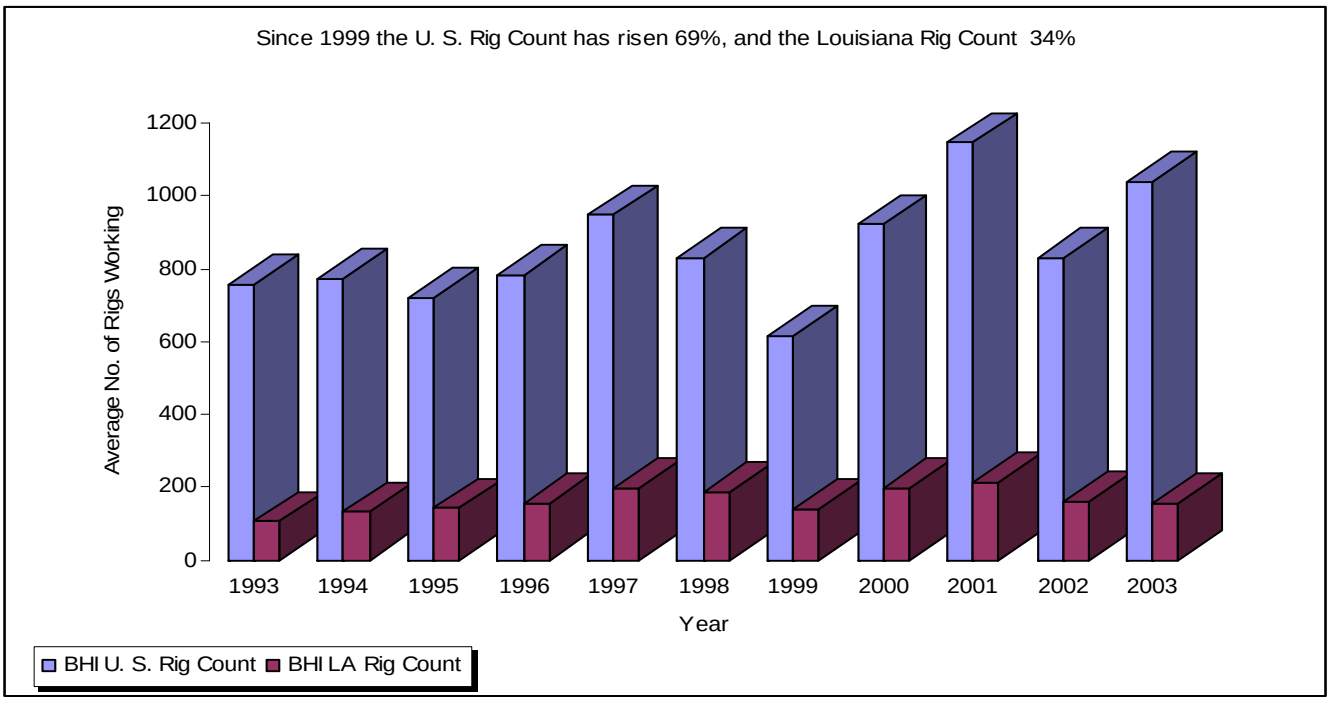
Rig count is the single most visible indicator of economic activity in the oil and natural gas sector. The number by itself is often misinterpreted. The economic implications of such technical factors as well depth, geologic location, subsurface pressure regime, well cost, federal and state tax incentives, and "hot" oil and natural gas plays affect rig count. Deconstruction of the rig count number, along with use of a new metric, barrels oil equivalent (BOE) discovery rate per rig per year should aid in understanding the meaning rig count and the significance of the relative rate of change of rig count by state or region.

Rig Count

Uses of the rig count metric are diverse. For example, Wall Street analysts use this number in their profit projections for oil service companies. State legislators use this number to assess whether their drilling incentive programs remain competitive with other states. So, when the general economy is reported to be in recovery, yet the Louisiana rig count rate of growth lags the national rig count growth rate, the question arises: "Should we be doing more?"

A Perspective on the Level of Drilling Rig Activity 1993-2003 (1999 was the period low point)



Source: Baker Hughes International (BHI) Rig Count, annual average of month end counts, 1993-2003

The Implications of Rig Count

Unfortunately, the single number rig count is subject to "spin." More often than not, in neither of the above cases, i.e., Wall Street analysts or State legislators, is there precision in the meaning inferred.

The meaning of rig count is complicated. Rigs drill wells. Wells are drilled with rigs matched to a depth capacity. The greater the depth, the greater the cost incurred. The greater the cost incurred, the greater the financial risk exposure for the operator. The greater the financial risk exposure, the less favorable is the market valuation of a public company (at least at this time in the market). The less favorable the market valuation, the less risk will be undertaken by public companies. The less financial risk undertaken, the smaller the oil and natural gas reserve discoveries. The smaller the reserve discoveries, the lower the domestic oil and natural gas production capacity. The lower the domestic production capacity, the greater the reliance on imports of crude oil and natural gas. The greater the reliance on imports, the greater the energy security risk to the economy (just look at the consequences from the supply boat collision at the mouth of the Mississippi River, week of February 21, 2004.)

The greater the energy security risk, the greater the call for energy efficiency. The greater the cry for energy efficiency, the more rapidly the need for capital spending on energy efficient equipment. The higher the capital spending need, the greater the need for profits and cash flow. The greater the need for profits and cash flow, the greater the need for cost cutting. The greater the need becomes for cost cutting, the higher the job losses and "off shoring." And so it goes, like ripples from a pebble dropped in water.

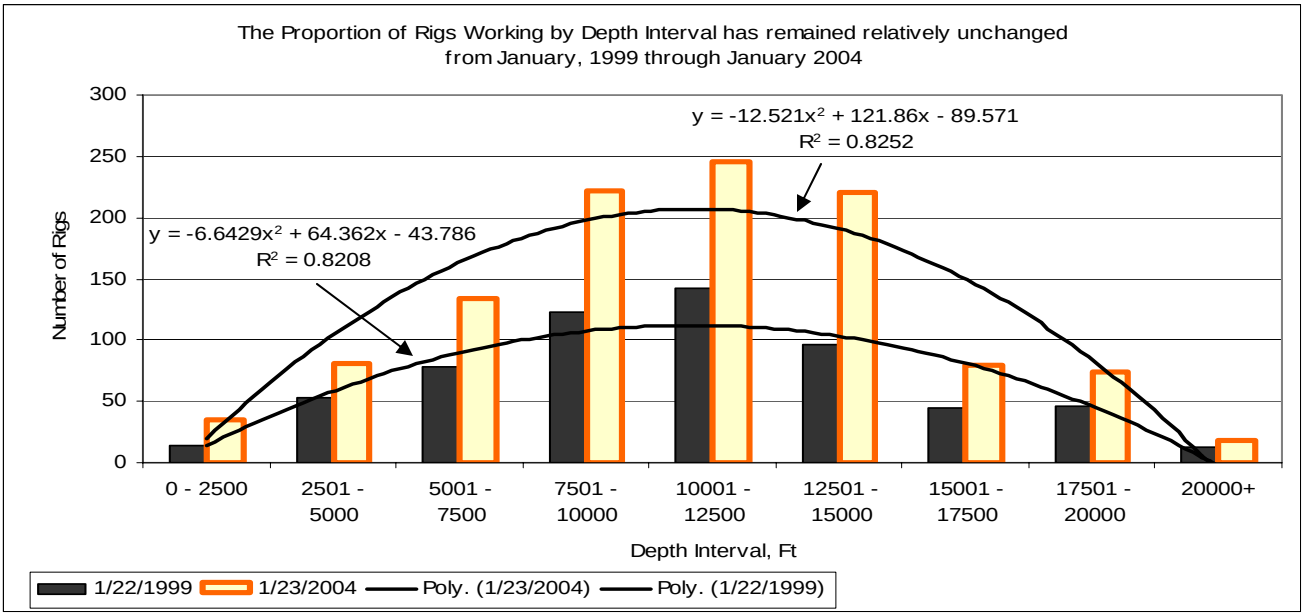
Louisiana has suffered from job losses; particularly those related to energy. Governor Blanco has made job growth her number one priority. Louisiana offers tax incentives to oil and natural gas producers to stimulate investment in drilling and production within the state. From a future production viewpoint, Louisiana is a natural gas state. It has deep (15,000 ft. to 24,999 ft.), and ultra-deep (greater than 25,000 ft.), natural gas reserves. These wells are risky and costly. Is deep and ultra-deep drilling beyond the financial capacity of the remaining oil and gas firms in the state? Are multiple numbers of these deep and ultra-deep wells beyond the financial capacity of even the largest of the major energy firms? Is it proper use of state taxpayer funds to subsidize Wall Street investment banks because of their biases? Is it proper use of state taxpayer funds to subsidize Federal Government tax revenues by granting state subsidies to drilling and production within the state?

If the coalbed methane producers can unite to gain a federal tax incentive, why cannot deep and ultra-deep gas producing states present their case to the Congress for inclusion with the coalbed methane incentive renewal? Is there a political will to undertake this deep and ultra-deep natural gas initiative with the same patience and persistence used by the coalbed methane state political forces? Is this issue of drilling activity more a public relations and public information challenge than a state incentives program challenge?

Deconstructing Rig Count Data

Crude oil and natural gas prices began a sustained rise in 1999. The number of active rigs has increased nearly 69% nationally, and nearly 34% in Louisiana, since that year.

Besides BHI, there is a second source of rig count data. Smith International provides a weekly count of rigs by depth rating. As the rig count has grown, the profile of depth brackets has hardly changed. The largest number of active rigs is in the 7,500 - 15,000 foot depth brackets.



Source: Smith International Rig Count

Between January 1999 and January 2004, the number of rigs working increased by 499 (BHI rig count). Citing only the areas with double digit gains, this gain in rig count occurred as follows:

Geographic Regions Experiencing Significant Rig Count Gain

State/Zone Rig Gain Rank	Rig Gain
Oklahoma	81
Texas RR # 5	42
New Mexico	38
Wyoming	37
Texas RR # 6	37
Texas RR # 8	36
Colorado	35
Texas RR #7C	21
North Louisiana	**19**
Texas RR # 2	15
Utah	13
Texas RR # 9	13
Montana	12
13 States/Zones with double digit gains in rig count	399 (of 499 gain)
by Comparison	
South Louisiana (land)	0
Louisiana Inland Waters	-2
Louisiana Offshore (federal and state)	-6
Total Louisiana	**11**

The state of Louisiana had a rig count gain of 11 between these two periods. Within the state, there were gains and losses; losses included the inland waters and state and federal offshore. North Louisiana land drilling was among the double digit gains. South Louisiana land drilling held steady. **So it would not appear that existing**

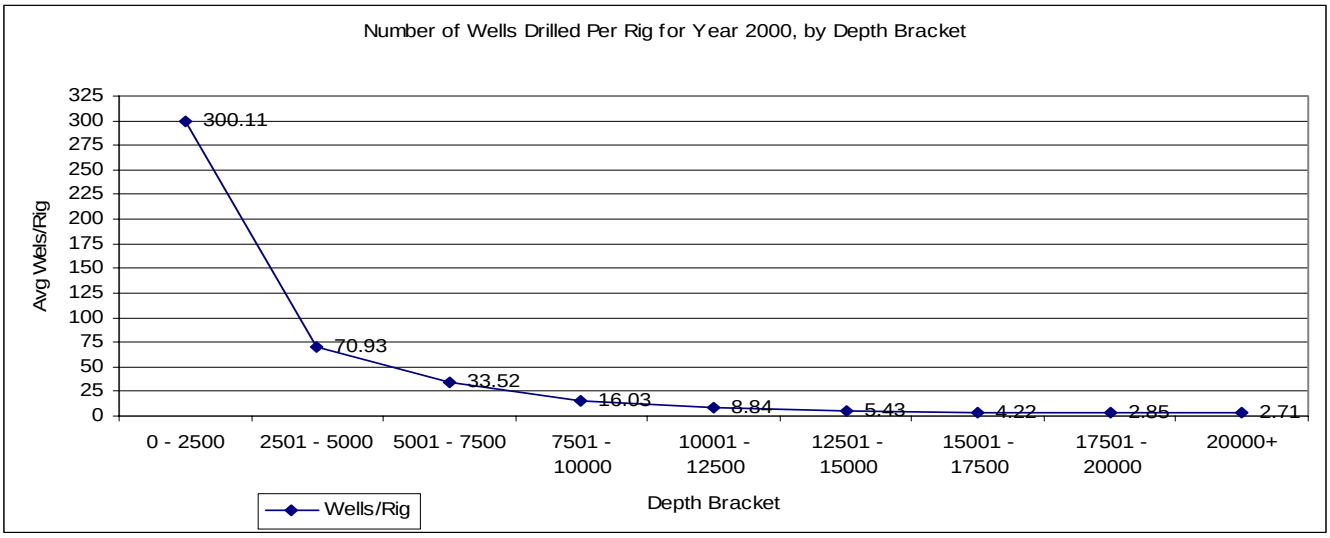
Louisiana tax subsidies, or the lack thereof, are the controlling factor in the level of drilling rig activity vis à vis other states.

What might be more controlling are well cost and discovery/cost relationships. Virtually all of the expansion in the active rig count was targeted for natural gas drilling and was on land. (Note: The two sources of rig count data, i.e., Smith and BHI, do not precisely coincide. The data are in closer agreement today than it has been in past years.)

Comparison of Rig Counts,
Smith International and Baker Hughes International

	1/22/1999	1/23/2004	Change
Oil Rigs	122	137	15
Gas Rigs	465	946	481
Offshore	105	99	-6
Source: BHI			
Inland (water)	14	27	13
Land	501	993	492
Offshore	88	89	1
Source: Smith			

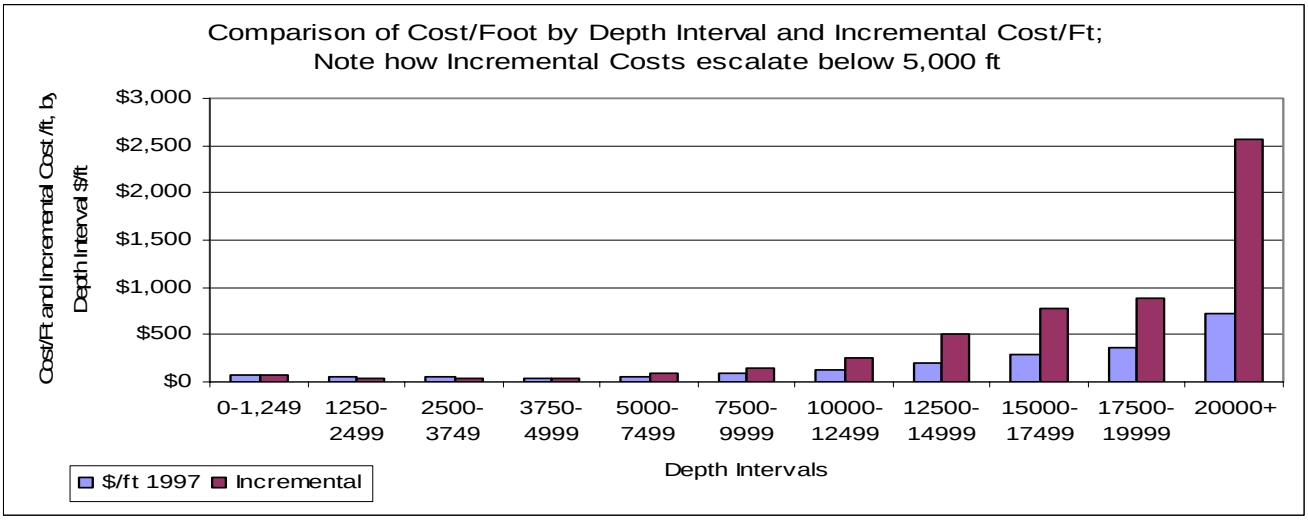
Rates of drilling penetration slow as well depths increase. Thus shallower working rigs can drill a larger number of wells in any given time period.



Source: Joint Association Survey on 2000 Drilling Costs and Smith International Rig Count

Well Cost Metrics

The cost of drilling escalates with depth, both the average cost per foot to a total depth, and the incremental cost per incremental foot of hole drilled. It is logical that companies seek first to exploit those reserves that are less costly which offer lower financial risk exposure, yet afford a return on investment from the size of the reservoir discovered**. A**lso, the larger the firm and the greater the need to replace oil and natural gas production, the greater the need to undertake drilling for larger reservoirs which are associated with increasing depth in a mature drilling province (e.g. the United States, in particular, Louisiana and the Federal Gulf of Mexico).



Looking at the 13 states/zones with double digit gains in rig count between January 1999 and January 2004, the average well costs by depth bracket for the year 2000 are ranked by escalating cost. This data provide some insight into the relative financial risk associated with each area. **In the table below the dollar figure indicates average well cost to that depth bracket in thousands of dollars; the numbers in parentheses refer to wells drilled to that depth bracket during the year 2000.**

A Ranking of the Escalating Cost of Drilling by Province

10,000 - 12,499	Zone	12,500 - 14,999	Zone	15,000 - 17,499	Zone	17,500 - 19,999	Zone	20,000 +	Zone
$677 (1)	CO	$1,099 (1)	CO	$2,254 (23)	OK	$3,381 (1)	E. NM	$5,216 (2)	OK
$752 (127)	TX #8	$1,460 (75)	E. NM	$2,279 (2)	MT	$3,575 (16)	OK	$10,278 (3)	TX #8
$971 (108)	E. NM	$1,530 (18)	MT	$3,500 (4)	E. NM	$5,355 (13)	TX #8	$16,294 (1)	WY
$1,100 (232)	TX #6	$1,627 (160)	OK	$3,643 (28)	TX #8	$5,899 (2)	TX #2		
$1,118 (191)	OK	$1,662 (158)	TX #5	$3,846 (1)	TX #7C	$7,115 (2)	TX #5		
$1,121 (9)	MT	$1,782 (14)	TX #8	$4,029 (10)	WY	$10,094 (4)	WY		
$1,123 (21)	TX #7C	$1,784 (48)	WY	$4,386 (23)	TX #2				
$1,218 (190)	WY	$2,217 (13)	TX #6	$4,470 (7)	TX #5				
$1,234 (77)	**No. LA**	$2,653 (5)	UT	$4,864 (2)	UT				
$1,254 (81)	TX #5	$2,889 (51)	TX #2	**$5,727 (1)**	**No. LA**				
$1,695 (44)	TX #2	$2,905 (6)	TX #7C	$5,906 (2)	TX #6				
$1,978 (18)	UT	**$3,384 (11)**	**No. LA**						
$2,630 (2)	TX #9								
Comparison		**Comparison**		**Comparison**		**Comparison**		**Comparison**	
$2,359 (100)	**So. LA**	**$3,480 (55)**	**So. LA**	**$5,246 (35)**	**So. LA**	**$6,676 (21)**	**So.LA**	**$11,892 (7)**	**So.LA**
$5,724 (118)	**O/SLA**	**$7,159 (82)**	**O/SLA**	**$9,797 (29)**	**O/SLA**	**$13,297 (5)**	**TXO/S**	**$18,853 (2)**	**O/SLA**
$5,966 (20)	TXO/S	$8,225 (17)	TXO/S	$10,974 (4)	TXO/S	$14,015 (11)	O/SLA	$27,105 (14)	FGoM
$8,037 (20)	FGoM	$12,452 (20)	FGoM	$15,125 (30)	FGoM	$17,534 (13)	FGoM		

Source: Joint Association Survey on 2000 Drilling Costs

Average Drilling cost per Well, by depth bracket in $000; numbers in parentheses are wells drilled by depth bracket

Abbreviations used

O/S LA offshore Louisiana (state waters)
TX O/S Texas offshore
FGoM Federal Gulf of Mexico

The Discovery Ratio

It is customary to think in terms of reserves per well. Because rig count is being examined, a new metric is necessary. The new metric compares barrels oil equivalent (BOE) of discoveries per rig per year for the 13 double-digit rig count gaining areas during the period 2000-2002. A comparison with Louisiana is provided.

The rig count used is the total number of active rigs from BHI over a three year period from 2000-2002. The state/zone reserve data is from the Energy Information Administration (EIA) for the same three year period. Only discoveries made through drilling, i.e., of new reserves and extensions to existing fields, excluding acquisitions, were used in the computation. Reserve data for crude oil, natural gas, and natural gas liquids (NGL) were tallied. Natural gas was converted to BOE using the ratio of 1,027,000 btus/Mcf (thousand cubic feet) and 5,800,000 btus per barrel of crude oil (0.177069 BOE/Mcf).

Ranking the Discovery Rate per Year per Active Drilling Rig per Year (2000 – 2002)

State/Zone Rig Gain Rank	Rig Gain	BOE/ Rig/Year	Rank
Oklahoma	81	754,607	11
Texas RR # 5	42	1,023,166	8
New Mexico	38	1,639,102	5
Wyoming	37	4,915,942	1
Texas RR # 6	37	748,691	12
Texas RR # 8	36	785,913	9
Colorado	35	2,966,951	2
Texas RR #7C	21	1,392,855	6
North Louisiana	19	1,284,590	7
Texas RR # 2	15	760,602	10
Utah	13	2,086,944	4
Texas RR # 9	13	2,405,598	3
Montana	12	641,968	13
13 Zone Total	399 (of 499 gain)		
by Comparison			
South Louisiana (land)	0	1,399,774	
Louisiana Inland Waters	-2	712,517	
Louisiana Offshore (federal and state)	-6	2,426,272	
Louisiana Total	11		

Coalbed methane reserves figure prominently in the above calculations. At this time, the leading producers of coalbed methane include: Colorado, New Mexico, Wyoming, Utah, and Alabama. Coalbed methane is categorized as unconventional gas in the Internal Revenue (IRS) Code. The tax incentive that applied to coalbed methane was referred to as the Section 29 gas tax credit (the Section of the IRS code). Shale gas also falls into this category. Substantial drilling initiatives are currently underway in North and Central Texas (the Barnett Shale play) and Eastern Oklahoma (the Arkoma Basin) for new discoveries and production of relatively shallow unconventional and conventional natural gas.

Louisiana's shallow reserves were discovered years ago. Louisiana is a deep drilling province today and its reserve discovery rates compare favorably with the metrics developed for the 13 rig count gaining areas. But another factor is worth considering at this point. In the December 29, 2003 edition of "Gas Daily," an article appeared entitled "In New Logic of Wall Street Losing Gas Supply is a Virtue." The article quotes Lehman Bros. analyst, Thomas Driscoll, "Investors now reward those companies that curtail (exploration) spending and devote the excess cash flow to debt reduction, acquisitions, share buybacks and dividends. We expect 2004 to bring more of the same."

The message from Wall Street - avoid risk. It should be clear Wall Street analysts who adopt this position are concerned neither with future energy supply nor with security for the economy or the nation. Deeper drilling areas are disadvantaged by these attitudes. Who is challenging this investment theme?

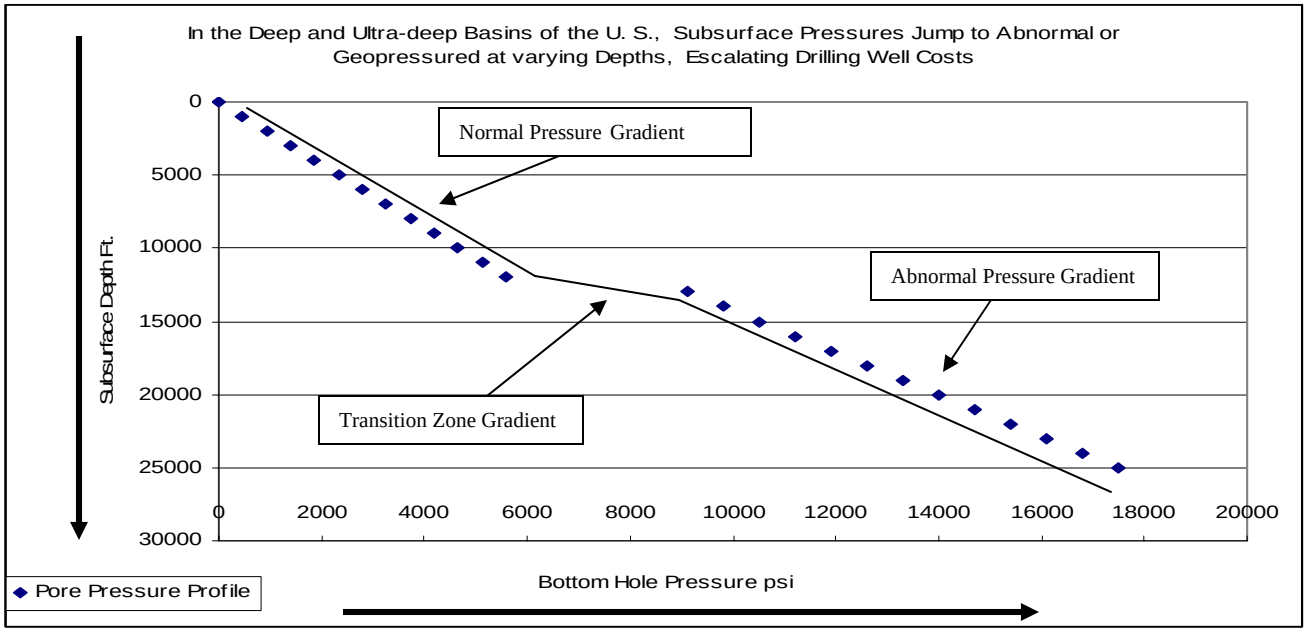
A Technical Factor Directly Affecting Cost

If there is one factor that drives drilling costs higher more than any other, it would be subsurface pressure. Louisiana is known as a geopressured drilling region, more so than any other producing province in the U. S. -- even in the world. (NOTE: Drillers refer to "geopressured," as a pressure gradient expressed in pounds per square inch per foot of depth [psi/ft]. A normal pressure gradient is a saline water gradient of 0.465 psi/ft.]. This geopressure is both a blessing and detraction. Higher reservoir pressures mean potentially higher quantities of reserves in the reservoirs and deliverability from the reservoirs. Higher drilling pore pressure profiles inevitably lead to higher drilling costs and drilling risk.

In North Louisiana and East Texas, the Cotton Valley Pinnacle Reef Play is geopressured; all of South Louisiana and the Federal Gulf of Mexico are geopressured; the Texas Gulf Coast is geopressured; the Anadarko Basin of the Texas Panhandle and Oklahoma encounters geopressured horizons; the Delaware Basin (in the West Texas Permian Basin) has geopressured producing horizons; as does the Wind River Basin of Wyoming.

Normal pressure (typically expressed as 0.465 psi/ft), or in some cases subnormal pressure, extends down to varying depths across each of these deep basins or provinces. And the geopressure ranges of commercially producing horizons generally vary from 0.6 psi/ft to 0.8 psi./ft.

A generalized plot is illustrated in the graph below, showing Subsurface Pressure from Surface Level down to Subsurface Horizons.



What does it all mean?

Perhaps the summary arbiter of where companies drill is contained in a comparison of how aggregate drilling budgets have been allocated by state/zone. To express this relationship it is again necessary to use the Joint Association Survey of Drilling Costs for the most recent periods for which the data are available (1999-2002), and to use a multi-year period to smooth out annual randomness.

The Top Three Drilling Expenditure Regions (1999-2002)
Dominate Domestic Industry Drilling Budgets

Political Subdivision	Wells Drilled 1999-2002 Year Total	Drilling Expenditures 1999-2002 Year Total
Texas	26,719	$26,260,881,000
Federal Offshore	2,090	$18,631,296,000
Louisiana	5,009	$17,630,068,000
subtotal	33,818	$62,522,245,000
% of U. S.	34.86%	81.68%
U. S. Total	97,010	$76,549,494,000

From 1999-2002, nearly 82% of U. S. drilling expenditures were directed into the Gulf South (includes the Federal Gulf of Mexico, Louisiana, and Texas), **the deep drilling province** of the United States. This expenditure was incurred on only 35% of the total wells drilled during the period**. Louisiana ranks 3rd from among all 50 states and offshore waters as the geographic location for industry drilling expenditures during this period.** Louisiana has consistently been among the top targets for the industry in terms of expenditures. If the number of wells drilled per rig declines with depth, the cost of drilling increases with depth, and the investment in rig equipment escalates for deeper drilling, it is safe to conclude the rate of growth in number of rigs working will be lower in a deep drilling province.

If the metric of reserves discovered per rig per year are among the highest in a deep drilling province (e.g., the Federal Gulf of Mexico and South Louisiana), it is safe to conclude the greater amount of expenditures will be incurred in those provinces and, therefore, not directly related to large escalations in rig count.

It is also safe to conclude that a federal tax credit is far more powerful than State tax incentives. And if a federal tax credit of nearly $1.00/Mcf can be earned for developing unconventional gas production, and since coalbed methane/shale gas are reached at shallower depths, it is safe to conclude an increased drilling and rig count emphasis will be directed to these areas. The top 5 BOE/Rig/Year areas for 2000-2002, Wyoming, Colorado, Texas RR#9, Utah, and New Mexico, are coalbed methane or shale gas drilling areas, i.e., “hot” plays.

It would be safe to conclude that many factors go into determining rig count, and the rate of growth in rig count. State tax incentives are only one such factor -- and appear to be a very limited consideration at that. Absent significant federal tax incentives which tilt the level playing field, the abundance of reserve opportunities with higher reservoir deliverability are a most compelling incentive for drilling and producing oil and natural gas, in Louisiana, the U. S. (and elsewhere).

For years, the Louisiana legislature, Governor’s office, and state regulatory agencies have assisted industry in developing the technology and best practices for drilling and producing oil and natural gas on land, in the wetlands areas, and in open offshore marine areas. As the industry is faced with a skeptical Wall Street, and the need to explore deeper horizons here in the U. S., it may be that State political leadership with non-tax initiatives will be more meaningful in advancing the economic health of the industry, the State, and the domestic economy. This would be consistent with Governor Blanco’s objectives for economic development by accentuating the state’s positives and promoting the advantages of doing business in the state. The economic metric of BOE/rig/year for Louisiana may be a tool in sustaining that political initiative.