

**FINANCIAL SURVIVAL FOR OIL & GAS WORKERS (free student edition)**

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\* Not in the free student edition

Please join the Facebook Group “Financial Survival for Oil Workers” in order to be alerted to the publication date of the full edition.

## INTRODUCTION

On Thursday, March 19, 2015, at about 10:00 AM, I got laid off from my job with the largest oilfield services company in the world, after a fourteen year career. My N+2 manager asked me to come to "a company meeting", where I met with a group of nervous managers and an HR representative. I experienced the classic gun battle stress reactions; tunnel vision, black spots, rapid pulse, shallow breathing, and auditory exclusion; as the manager started talking about "the unprecedented decline in oil prices... forcing a major revision of our business plans... we're sorry, Peter, today is your last day..."

It was all so humiliating. It was really difficult, as the primary breadwinner male, to face my wife when she came home that day. I broke down and wept on her shoulder. It was the worst day of my life up until that point. Fitting that it should happen during Lent: "...though I walk through the valley of the shadow of death..." When my daughter heard the news, she went off someplace in her school and cried. Her application for a college scholarship through my former employer's charitable foundation was automatically cancelled the moment I was terminated, along with our family's health and disability insurance.

More than sixteen months have passed since that dark day. I have been one of the extremely fortunate ones, as I have been working almost continuously in my field since, at decent wages to boot, with only one month idle. My daughter is thriving at college. My wife is at peace. Despite my good fortune, I believe the layoff will remain in my life as a bright, traumatic line of demarcation. Time will always be divided into "before 3/19/15" and "after 3/19/15". And the danger has certainly not ended. Oil is still below \$45 per barrel. Anything could happen.

People who experience a trauma typically re-live the experience in their minds. They ruminate and ponder what has just happened to them, in order to make sense of it all, to extract some meaning from the experience. I have been no different in this regard. I have found myself facing several questions:

- Why did the layoff happen?
- Did I miss any advance warnings of the layoff?
- Could I have better prepared for it in any way?
- Was it a bad idea to have pursued an oil & gas career to begin with? I decided to become a Geophysicist in 1979 at age eighteen; what advice would my old self give to my young self?

As time has passed post-3/19/15, I have realized I do indeed have some of the answers to these and other difficult questions. Influenced by our education, our family upbringing, our own natural tendencies, and luck, my wife and I managed to put into place over the years a web of practices which have served to keep our family safe since 3/19/15, and should continue to function into the future.

This book emphasizes making preparations. I don't discuss much what to do after a layoff. Once you are laid-off, it is the depth and quality of your prior prep that will greatly govern your post-layoff experience. Once you are laid-off, your economic boundary conditions are set in stone, and you simply have to ride it out. I would rather devote these pages to getting you as well-prepared as possible for any adverse event, and hopefully, no adverse event at all.

Most importantly, I have managed to answer the final question, "Should I have pursued this career at all?". In order to make the question practical and forward-looking instead of introspective and backwards-looking, the question should be restated as, "Should young people consider an oil & gas career?" I believe the answer is, "Yes, young people should consider an oil & gas career, if it appeals strongly to them, if they can bear the risks... and because the risks are significant, extra precautions are warranted". My recommendations for precautions are described in this book, with separate chapters for all stages of life.

I am honored to dedicate this book to the young people who wish to pursue a career in oil & gas, despite the poor publicity the field is receiving since the oil industry depression started in late 2014. Consider the information on these pages to be much a part of your personal and family protective gear as your hardhat, hand and eye protection, steel-toed boots, and fire-resistant coveralls.

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Texas, USA  
July 2016

## **CHAPTER 1 - Oil Prices**

### **Oil prices - the wellspring of blessing and curses**

It does not take long for any oil & gas worker to realize that the industry lives and dies based on the price of oil, and therefore oilfield employment, hiring, and firing swings wildly with oil prices as well. Exactly how wildly can be seen if we search the Internet for some data.

In this chapter, we are going to take a look at:

1. How severe these price swings have been over time
2. Why they occur
3. Are there simple “early warning systems” which can help us with our careers and finances?

### **A century and a half of instability**

If we search the Internet using search terms “oil price” we will find many charts that show the highly volatile price of oil over the years. In order to make a fair comparison between today’s oil price and oil prices from many years ago, we must use the “real” or inflation-adjusted prices, since we know that a US Dollar from the past buys more than a US Dollar today. Prices not adjusted for inflation, in the US Dollar of the day are called “nominal” prices. The oil company BP published an informative chart oil price, at [BP.com > Energy economics > Statistical review > Oil > Oil prices](#). This chart, reproduced in Figure 1, shows year 1861 - 2015 oil prices in nominal US Dollars, and also oil prices in year 2015 real (inflation adjusted) US Dollars in Figure 1:

# Oil prices

Dated Brent averaged \$52.39 per barrel in 2015, a decline of \$46.56 per barrel from the 2014 level and the lowest annual average since 2004

Crude oil prices recorded the largest decline on record in dollar terms, and the largest percentage decline since 1986. The annual average price for Brent, declined by 47% reflecting a growing imbalance between global production and consumption. The Brent-WTI differential narrowed for a third consecutive year, to \$3.68 per barrel.

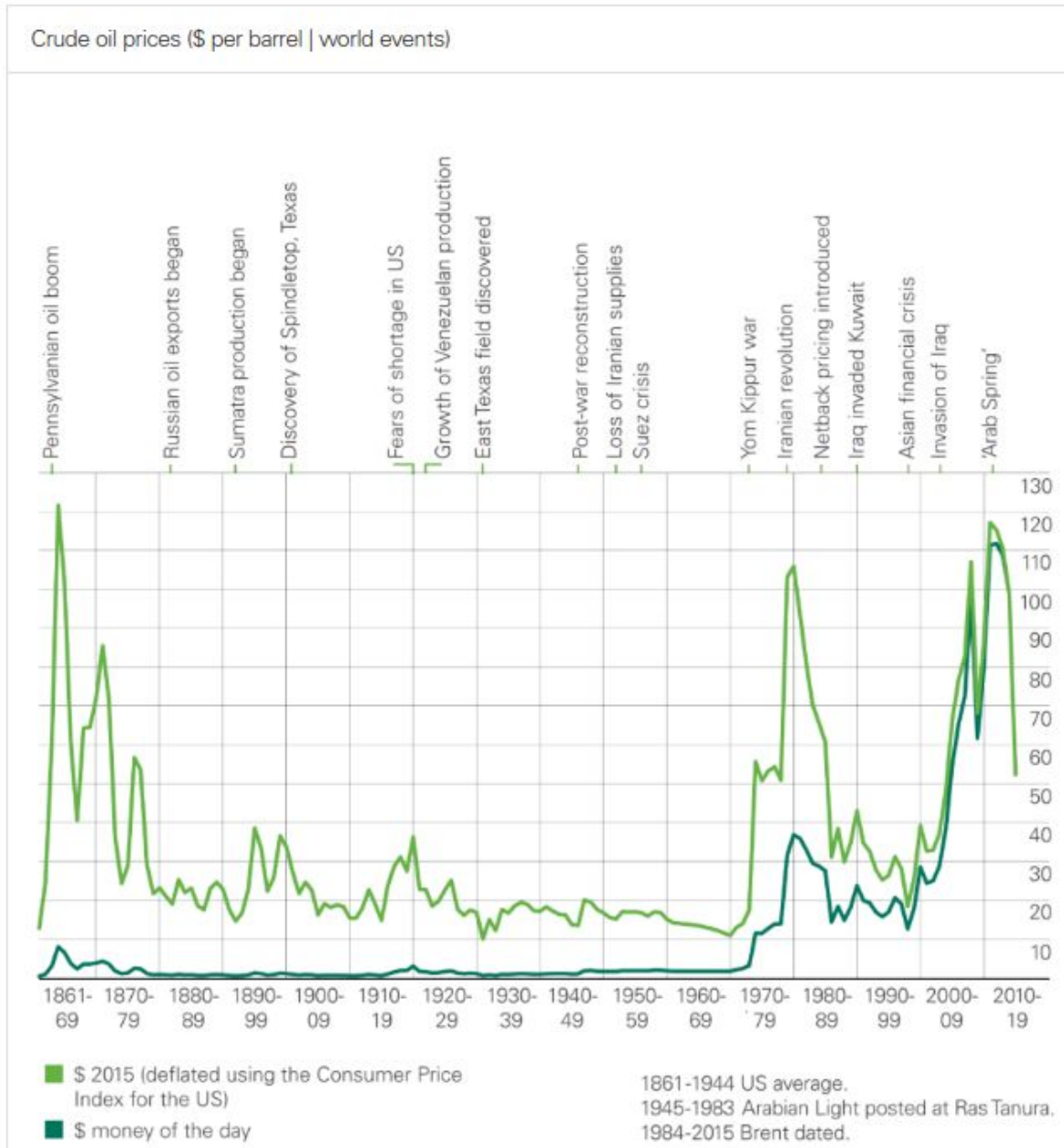


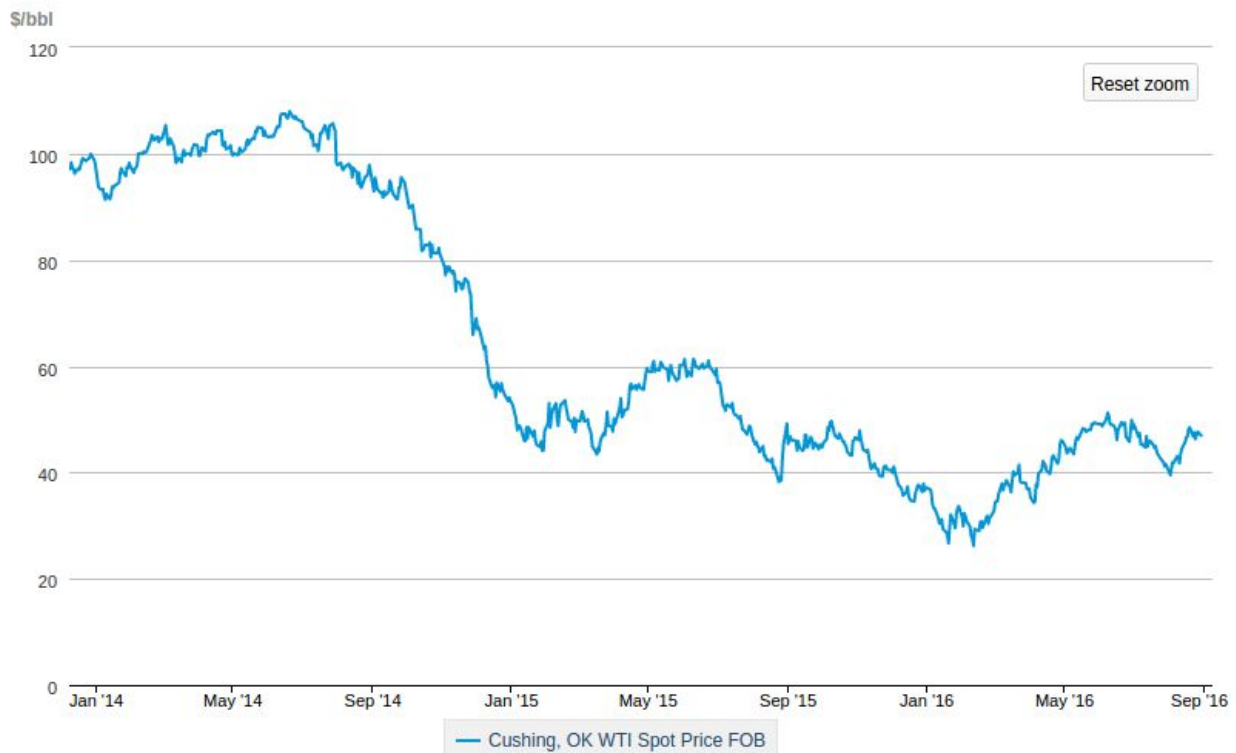
Figure 1 - Nominal and real oil prices (BP)

What Figure 1 shows is that the real oil price, the price we care about (the light green line, in 2015 US Dollars per barrel) were very high during the the US Civil War years, then they were volatile but trending downward until about 1880. From 1880-1973 they were on a long-term trend downward, with some volatility, and amazingly, this cheapening of oil in real terms was not even significantly impacted by the turmoil of two World Wars! But suddenly, after the 1973 event known to US consumers as the Arab Oil Embargo, the 2015 Dollar real oil price surged almost *ten-fold* from about \$10 to over \$100. This reversed, and by 1986, the prices were about \$30. Prices crashed further by late 1999 to under \$20. Then they reversed, and by mid-2008, just before the Great Recession, they were over \$110. The chart ends showing the latest steep price crash in the low \$50 range at the time of the publication of this chart. As we all know, the story evolved further in late 2015 and into 2016.

Figure 2 below, a chart of West Texas Intermediate Crude (WTI) prices from the US Energy Information Agency, helps us to fill in the time period since mid-2015, which the BP chart does not show. This is a much more detailed chart, showing daily prices for WTI crude oil. Because there hasn't been hardly any inflation from 2014 to 2016, it's permissible to consider nominal and real prices as being the same. We observe that by July 2014, WTI prices started a steep decline, plunging to \$26.19 on February 11, 2016. As of the day of this writing, the price is in the mid-\$40s.

## Spot Prices

↓ DOWNLOAD



THOMSON REUTERS Source: U.S. Energy Information Administration

Figure 2 - Nominal West Texas Intermediate Crude prices (US EIA)

We see in the historical record a century and a half of oil price instability, since the very dawn of the oil era, continuing on into the present day. And closer to the times in which we live, over the 43 year old lifespan of a middle-aged person, since 1973, oil prices in real terms went up 10x, then decreased by 5x, then increased by 5x, then decreased by 4x. Sudden price declines like the most recent 2014-2016 decline, cause huge problems for employers. Their budgets quickly are made irrelevant. In the business lingo, they have “no visibility” into their profit and loss position. They find it difficult or impossible to hang on to employees, or even to keep operating at all, depending their financial condition.

## Lynxes and Hares

So why are oil prices so volatile? While it is impossible to predict the price of oil from day-to-day, it is possible to understand some of the drivers that force oil prices up and down. These become clearer with the benefit of hindsight. As we know, “hindsight is always 20/20”. Interestingly enough, there are analogies to oil and other commodity price swings and natural systems. Let’s consider Lynxes and Hares.



The Lynx, a predatory cat, hunts and eats Hares, a vegetarian prey animal. If the Lynxes, as a group, happen to have a lot of success in hunting, they will become well-fed and healthy, they will hook-up with other Lynxes, and there will be Lynx pups - more mouths to feed. Eventually, the Lynx population will grow to the point where the Hares get over-hunted, and their population will decline, and possibly crash if there is a hard winter or other adverse event. If their numbers decline swiftly, the Lynxes will simply starve. If enough Lynxes starve and die, then the Hares will be able to stage a comeback with fewer predators coming after them. And so the cycle repeats. Each end-state of the system... high Lynx population, or high Hare population... is inherently unsustainable, and the system inevitably oscillates.

It's a similar situation in the oil business. A favorable oil price and the potential for good profits draws investors into the oilpatch. But as more players enter the market, more oil gets produced. As we know from basic economics, if a market becomes oversupplied with goods and services, the price offered by consumers declines. The price can stay up so long as supply and demand are in balance, but if more oil comes on-line than can be used by the world's consumers, the price will inevitably fall.

A parallel development occurs in oilfield services. The oilfield services companies follow the Exploration & Production (E&P) companies in, and if their services are somewhat scarce and in high demand at the time, they will be able to demand high prices from their customers and make good profits themselves. These profits draw investors in, and new firms will be formed to serve the market. As oilfield services becomes oversupplied, prices there too will fall, because of competition, and if oil prices are also retreating, the E&P companies profits fall, or they start taking losses. At this point, they cannot justify spending as much on oilfield services as they did before; they put the squeeze on their suppliers, or the orders simply slow and stop.

Under some market conditions, the largest producers - The Texas Railroad Commission for most of the 20th Century, and then Saudi Arabia after 1973 - can act as "swing" producers, moderating and stabilizing market prices by modulating their production. But, in doing so, they give up market share, and leave money on the table. So once in awhile, the swing producers simply get tired of that role, and they will try to punish the other market participants, by strongly ramping up their own production, and letting prices crash in hope that weaker players will be forced out of business. We are in such a phase now. During Thanksgiving 2014, OPEC, led by Saudi Arabia, decided they were tired of being the world's swing producer, and they decided to not give up any more market share to North American shale producers. Oil prices crashed precipitously at the close of that meeting.

You'd think that in an oil price decline that rational companies would just shut-in production and wait it out. The problem is that oil is a heavily financed industry. The terms of loans to E&P companies demand payment, no matter what - the imperative for companies is to keep the oil and cash flowing and keep as many of the loans current as possible, even if they are producing the oil at a loss.

After many quarters of financial losses, previously enthusiastic investors will begin to act in a risk-averse manner towards making further oil & gas investments. As the lines of credit disappear, the ability for companies to pay for further drilling, completion, logging, seismic, software, and pumping decreases. Remember, oil & gas reservoirs naturally deplete, and companies have to pour in money to keep running in place on the production treadmill. Eventually, the ability to keep producing large physical volumes of oil will decrease.

On the demand side, consumers enjoy the lower oil prices. Sales of large gas-guzzling trucks and SUVs generally expands during oil price crashes. Cheap oil undercuts alternative energy investments, and currently, cheap natural gas is even displacing coal as an energy source. It is thought that the natural gas industry is more to blame for the coal industry's woes than Greenpeace.

Eventually, as demand rises, and as production declines because of too few new investments, too few workers, and because of old, wrecked, and cannibalized equipment, oil & gas become relatively more scarce, and prices increase again. And the cycle repeats, like the Lynxes and the Hares.

### **Early Warning Systems**

It is in this seemingly endlessly chaotic environment that all of us enter school, graduate, begin our oil & gas careers, and then eventually, we end our careers... either voluntarily or involuntarily. We can do absolutely nothing about the accident of the timing of our life. And we can do absolutely nothing about the price of oil, and relatively few of us can influence how well the industry or our employer is equipped to deal with these prices.

Does that mean we can do nothing to manage how oil price fluctuations affect us and our families? I do not believe that. I think we can gain some insights from industry data, and get some advance warning, enough time to get ready for a possible personal financial earthquake.

The U.S. Geological Survey has set in place earthquake and tsunami warning systems that give the operators of critical infrastructure components like nuclear power plants, subway trains, and airports a precious few seconds and minutes to insert control rods into nuclear reactors, stop the trains, and keep planes from landing in case of an earthquake. Should they ever be utilized, the warnings given will never be far enough in advance, because of the high velocity of earthquake waves; but they will be better than no warning.

I propose that we in the industry all make use of the commodity and financial information available for free around-the-clock on the Internet. Not only is raw data available, but there are many clever financial charting and analysis tools available for free as well.

Now, it is impossible to cover a complex topic like technical chart analysis even if I were to devote this entire book to it, and I am by no means a Certified Market Technician (CMT), but I can demonstrate a few basic principles and suggest how you might use them.

For those of you with no familiarity with financial jargon, data, or charts, please do not be intimidated. I suggest you just bravely dive in and follow me step-by-step on your computer as I describe the procedures for making some charts which will be useful in keeping watch over possible storms brewing in your oil & gas career.

Please follow step-by-step:

First of all, let's look at a basic chart of WTI crude oil prices from StockCharts in Figure 3. You just navigate to [www.stockcharts.com](http://www.stockcharts.com) on the Internet, and type in "\$WTIC" in the "Enter Symbol or Company Name" box, then hit the "Go" button. The type of chart you want to make is just the default type, a "SharpChart". To exactly duplicate what I did below, I changed the Period from "Daily" to "Weekly", and I only kept one Overlay, a "Simple Moving Average" with a period of "40", the other overlay I set to "-None-", and I set the Range to "2 years" (don't type any of the quotation marks I have used into StockCharts; they are just to make things clear for you. Quotation marks will confuse Stockcharts).

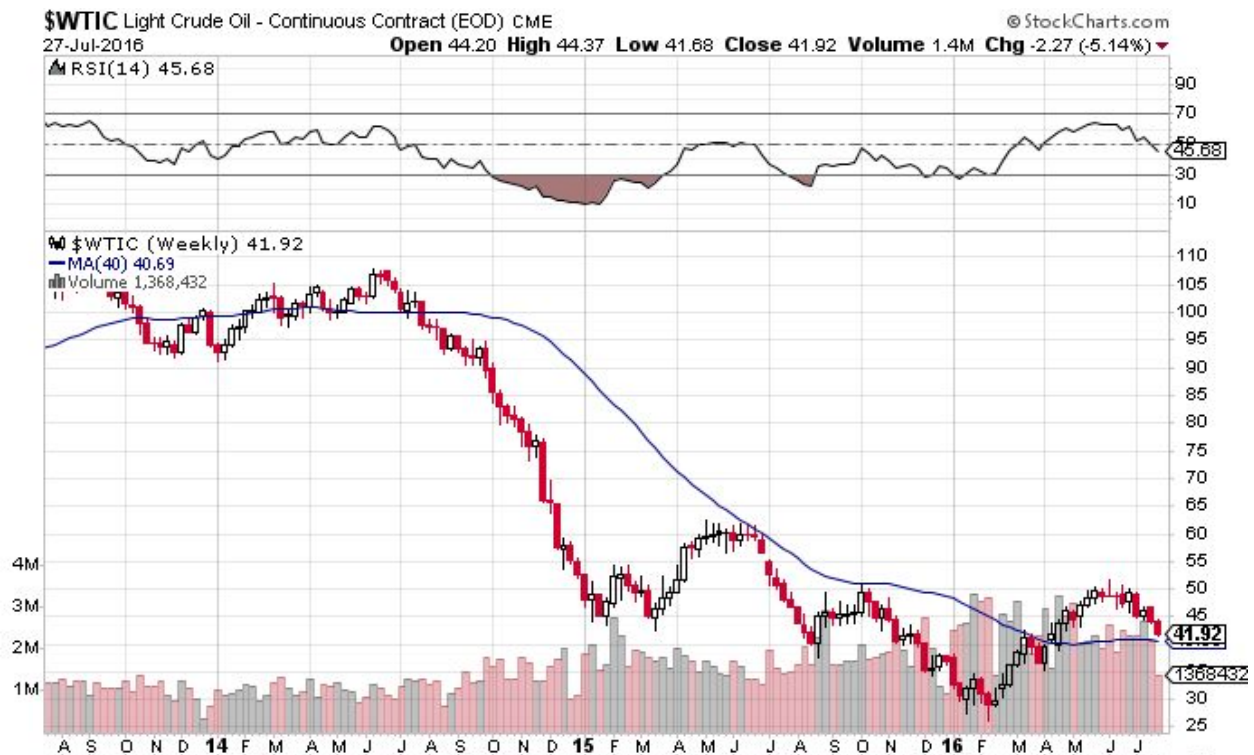


Figure 3 - Weekly price chart of \$WTIC, West Texas Intermediate Crude

The blue, smoothed line is what is called the "40 week moving average of West Texas Intermediate crude". Because there are five trading days in a week, the 40 week moving average is about the same as the 200 day moving average. Both will give similar results.

How do you compute the 40 week moving average of West Texas Intermediate crude? Stockcharts just takes the price of WTI crude oil at the close of business on Friday afternoon for the last 40 weeks, mathematically averages them together, and posts that average on the most recent Friday on the chart.

Moving averages are useful to analysts because they show long-term underlying trends in prices without the day-to-day "jitter" or "chatter". What is really useful about moving averages is

when you get a “moving average cross”, where a price crosses over its own moving average. This can often indicate a change in the long-term trend, the beginning of one of the many “bear” (prices decreasing) or “bull” (prices increasing) market which are seen in Figures 1, 2 and 3.

Referring back to Figure 3, the price of WTI crude, shown in red, white and black “candlesticks”, was diving below and popping above the 40 week moving average line frequently since the end of the Great Recession, from 2010 onwards. But notice what happened to the blue line around August 1, 2014. The candlestick price bars dived underneath the 40 week moving average line and they kept on going down. This is a classic long-term “bear market” technical indicator. This is a warning sign of further price weakness.

This moving average cross took place shortly before a very steep, deep price decline. In retrospect, because hindsight is always 20/20, we can see that something quite bad was shaping up by October 2014. The moving average cross took place almost four months before the fateful Thanksgiving 2014 OPEC meeting, and almost eight months before I was personally laid-off; and I was one of the earliest layoffs in this cycle. I wasn't paying attention to the WTI price action in 2014, but I really should have been. I would've had many extra months of prep time. As it was, I was not expecting to be laid off; I was caught very much off-guard.

Is \$WTIC the only ticket symbol to look at? By no means. For those interested in natural gas, if you work for a natural gas company, the symbol to use is "\$NATGAS".

You can also get oil & gas prices from the U.S. Energy Information Agency. The web address is [www.eia.gov/dnav/pet/pet\\_pri\\_spt\\_s1\\_d.htm](http://www.eia.gov/dnav/pet/pet_pri_spt_s1_d.htm)



Figure 4 - Energy Select SPDR Fund, ticker symbol XLE

Figure 4 shows the symbol "XLE", which represent an exchange-traded fund (ETF) which contains the stocks of a basket of large oil & gas firms, so this price is a proxy for oil & gas industry health. Notice the 40-week moving average cross took place in September for this fund; more than a month later than for \$WTIC. In other words, oil & gas investors didn't figure out what the change in oil price really meant until a month after it started declining, but when they did, they starting dumping oil & gas stocks.

When investors think a company (or group of companies, like an ETF) has a good chance of making a profit, they buy the stock, and the stock price gets bid up. If they think it will be a money-loser, then sell the stock, and the stock price declines.

Why might you want to monitor oil & gas company stocks using XLE instead of the hydrocarbon price directly? Well, for one thing, no one actually is "employed by the price of oil". People work for companies, which are all part of an industry. By watching oil industry health, you are getting closer to what you care about, which is... "are they healthy enough to keep paying me?"



Figure 5 - SPDR S&P Oil & Gas Equipment and Services ETF, ticker symbol XES

Figure 5, symbol XES, which represents an ETF of oilfield services companies, has showed a much steeper loss of value since the 2014 peak, reflecting the fact that oilfield services firms have suffered earlier and worse than their customers who are reflected by XLE. The moving average cross took place in late July 2014. If you work for an oilfield services company, you should monitor this ETF. This is the one I look at.

One problem with ETFs is they haven't been around for a long time. Their older cousins are called Mutual Funds. If you look at energy industry Mutual Funds, you get a longer-term glimpse into the history of oil & gas industry health; and written into those charts are the untold stories of people getting hired and people getting fired.

The Fidelity Select Energy (FSENX) and Energy Services (FSESX) mutual funds are similar in coverage to XLE and XES, but they have a longer history, going back to 1981 and 1985. These long histories are quite interesting to look at, see FSENX in Figure 6 below which shows 1990-2016:

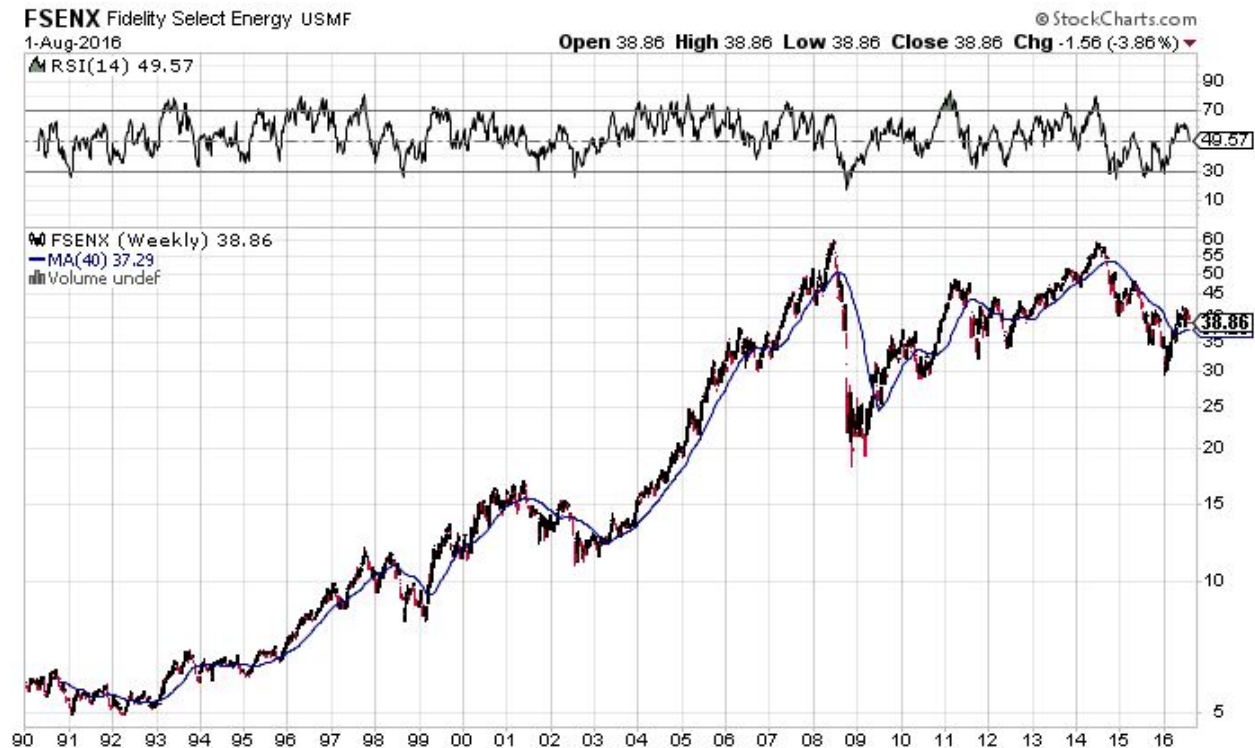


Figure 6 - Fidelity Select Energy Mutual Fund, ticker symbol FSENX, 1990-2016

Oil field veterans will remember the layoffs on this chart that most companies went through: early '90, late '90s, early 2000s, 2009, and currently 2015-2016. The 40-week moving average cross precedes all of them.

If you work for a publicly traded company, you can, of course, follow your own company stock using Stockcharts.com. If you work in precious metals mining, try "GDX". If you work for base metals mining, try "DBB". GDX and DBB are ETFs for those two mining sectors.

Is the moving average cross an infallible indicator? No, the price being tracked periodically dives below and and surges above the 40-week moving averaging, a process called "whipsawing", where a price crossing move is suddenly reversed a few months later. Does that mean it's a useless indicator? Of course not; isn't it better to respond to a danger sign which turns out to be a false alarm and a fire drill, than to be walking around in the dark and suddenly fall into a hole without any warning? Personally speaking, I would have done things a bit differently if I'd been tracking the price more diligently in late 2014.

In order to preserve your sanity, I would suggest not being tightly plugged into the 24-hour business news cycle. At most, check oil prices and stock prices once every two weeks. For example, there are two well-known tactical asset allocation investment strategies, one by Gary Antonacci and the other by Dr. Mebane Faber, which use momentum indicators and moving averages, and both their trading systems specifically recommend to "Look at your investments once a month and forget about them the rest of the time." In other words, they encourage you to



try to enjoy your life. Checking and making decisions more frequently does not add value. In fact, looking less frequently is by itself a whipsaw filter. Sound advice. I wish I could always follow it. I, too, am a slave to my smartphone.

If we get crosses below the 40-week moving average in the future, does that mean we should panic and run to the hills? I would say no, never panic, but it means you should definitely start pre-positioning your long-term preparations for something worse that might be coming down the road.

Most of what I describe in the rest of this book are long-term preparations that will hopefully be put in place before the storm hits, and truthfully, they take a long time to put in place no matter what the price of oil is doing. Learning how to budget and control the Dollars in your household takes time and effort. Building up an oil & gas industry-sized emergency fund takes time. Paying off your mortgage takes time. Planning your alt.career takes time. So no matter what the oil price is doing this day, isn't it a good idea to start getting your life in order so that in the end you'll be able to take whatever life and this fickle industry dish out?

## Chapter 4 - Life stage 1: Students

Perhaps you are a student, preparing for an entry into an Oil & Gas career. Or, maybe you are the parent of such a student. You could be in high school, college, or graduate school. In any case, the remarks on the following pages apply to you.

We have right before us, unfortunately, the case of students who entered university programs in Petroleum Engineering, Geology, and Geophysics in Fall 2012 and graduated in Spring 2016. They were in school when the shale boom was really booming, summer internships were easy for them to get, and there was a lot of talk and promises about how bright their future was, and how the sky was the limit.

Then, in July 2014, after their Sophomore year of college, the price of oil started to dive, and it kept on diving. By graduation in Spring 2016, most of them were unable to find work in the industry. Some who had offers from on-campus college recruiting had those offers rescinded.

This is exactly what happened to my cohort of Oil & Gas workers, those who decided in college around 1979-1980 that the sky was the limit for us in Oil & Gas, but then by the time we emerged with graduate degrees in the mid-1980s, the party was substantially over, and the party-goers were waking up in the gutters with hangovers and soiled clothing. I was one of four lucky new-hire Geophysicists hired by Amoco Production Company's Houston "SETEC" division office in 1986 (Amoco was purchased by BP in 1998). I am certain I called my Amoco recruiter, Dr. Wayne Campbell, a Virginia Tech "Hokie" who has long since retired to Hokie-land, every week prior to my start date to find out if I still had a job.

Then, two weeks after I started working at Amoco, coming to work every day with a briefcase, wearing wingtips, a pin-striped 1980s power suit, and a paisley tie, Amoco had its first mass-layoff ever in its 97-year history (it was founded in 1889 in Whiting, Indiana), and it was a bad one, something like a 10% cut. And that was one of the first of many that would continue until the final cataclysmic lay-off in January 1999, after the purchase by BP was finalized.



So I would say we've gone "Back to the future". The times of 1986 are repeating, more or less, thirty years later, as far as the Oil & Gas outlook for students is concerned (left - a promotional poster from the 1985 movie of the same name).

### **So what then is a student to do?**

I think what times like these demand is that you develop "Plan B" skills and capabilities all the way through your educational experience. Yes, this is an additional burden, which will cost you

time, money, and energy. But need to do this in case you approach graduation day and you are unsuccessful in landing that Oil & Gas job. Or maybe you land it, but through no fault of your own, you can't keep it.

It makes sense to pursue training and certifications that are recognized by and transferable to other industries. Welders, machinists, pipefitters, electricians, fire-fighters, and commercial truck drivers can work directly in other industries. As you get into more specifically oilfield jobs, it will be harder to convince a non-oil employer what exactly your years as a roustabout or roughneck mean in terms of what you can do for them. The problem is similar to that of former military trying to re-enter the civilian workforce. The military is very specialized, with its own sometimes secretive job categories and lingo. The civilian employer generally doesn't appreciate all that military people do, so they go under-appreciated, and therefore under-hired.

For university students, again, it makes sense to pursue degrees that are recognized by and transferable to other industries. Mechanical, electrical, chemical, and civil engineers can work in various industries. It's tougher for Oil & Gas specialized degree-holders like petroleum engineers and geoscientists.

If you are going to be an Oil & Gas specialized degree-holder, you could pursue an academic minor or certification in something else, something that could also get excited about. And I think here the sky really is the limit; you could make a close-angle pivot and get certified in something very close to your major. For example, a petroleum engineer or geophysicist might minor in math, or computer science. A petroleum geologist might minor in hydrology. Any geoscientist could become skilled in geographical information systems (GIS).

Alternatively, you could make a wide-angle pivot and collect a skill or credential in something entirely different, for example, you could earn a teaching certificate, or minor in business, or if your family has a family business that you never really considered joining (which is perhaps why you went to college), you could invest some time helping in that venture. There is no rule that says a college student can't also pick up a skilled trade, like welding or machining. In fact, those skills could compliment an engineering degree, because then you'd know something about how things really have to get done in the field, and not just how they should get done "theoretically". Field people always complain that engineers send them off to do impossible tasks.

All of these remarks apply even if you have no plans to ever go on to college. Please don't just transition from high school to the drilling rig and then assume you won't ever have to learn anything new ever again. At some point in your lifetime, and sooner than you think, an oil bear market will hit and you will be looking for work, and there will be no jobs to be found in the industry. If you have training and certification that means something to an employer in another industry, in another city or town away from the oilpatch, you will be ahead of the game. If you don't, you may be working minimum wage jobs, even if you made \$100,000 a year on the rig.

My own personal story has been that of a wide-angle pivot; I have been preparing to enter the financial services industry in case I get permanently ejected from oil & gas. In 1988, after two

years at Amoco Production Company, I took the hint from the repeated layoffs and earned an MBA degree part-time at night at the University of Houston. I finished in 1992. Amoco paid my tuition and books; all I had to do was put in the time. Fast-forward to 2016, my wife and I are now empty-nesters, but under the threat of continuing hard times in the oilpatch, I refreshed my 1988-1992 education by earning the Chartered Retirement Planning Counselor<sup>SM</sup> (CRPC®) designation online from the College for Financial Planning in Centennial, Colorado. All of these qualifications I am quietly holding in reserve in case I ever need them, because as of today, I am still working full-time in oil & gas. But even if I don't use these qualifications, they still literally enrich my life. I use the knowledge to help out my family and friends, as well as myself.

What is instructive to me is that of our cohort of mid-1980s Amoco Houston geophysicists, many or maybe even most aren't in geophysics any longer. They moved on to downstream oil refining / petrochemicals, to business consulting, to information technology, and even to the California wine business. Most of them were voluntary leaves... after years of repeated downsizings in upstream Oil & Gas, many of them simply had enough, and decided to pursue other passions.

I am certain on their respective Amoco hire dates, they did not think, "Yes, and in ten years I will no longer be in this company or even this industry". And yet, that is exactly what happened. That seems sad in a way, it seems wasteful to earn a degree in a field and then not use it, but the good side of the story is that it also demonstrates that a good science, engineering, and math education prepares you for many things, and that people are resilient, and are capable of making decisions and working in order to secure their own happiness and security for their families.

My suggestion to all of you who are starting out in Oil & Gas is that you embrace the uncertainty, prepare professionally and emotionally for a couple of divergent outcomes, and then whatever happens, you won't feel paralyzed and without any options.

### **Student debt, the risk-multiplier**

For the first time in history, the amount of student loan debt has recently surpassed credit card in the United States. Herein lies a lesson from the often counter-intuitive world of economics. Of course, the expansion of student loans was meant to help students to afford college, but it is one of the factors that has made college unaffordable. Let's say you were a butcher, and a customer was coming to your shop with \$100 in their pocket, and you knew it, because you have x-ray vision. How much would you try to get from them in the pending meat sale? As much of that \$100 as possible, right? Or maybe \$100 today, and they can owe you \$5, for a total sale of \$105?

Well, colleges and universities have x-ray vision that can see the money in your pocket. It's called FAFSA. Even if you personally don't fill out the FAFSA, they know in the aggregate or on average how much money students come to the table with, both in parent and student savings

and in student loans. And like the butcher with x-ray vision, they try to take all of those available funds by raising prices to the unreasonable point they are at today.

You need to resist the urge to take on student loan debt if you are pursuing an Oil & Gas career. Why? Because debt, as any finance student can tell you, is a multiplier of risk and return. Let's say the stock market is giving you a 10% annual return, if you double-up and buy twice as many shares using borrowed money (buying shares "on margin"), you could theoretically make almost a 20% annual return (20% annual return minus the loan interest payment).

But if the market turns against you, and your shares have losses, the debt magnifies the losses. If you sell your shares, you more than have twice the losses, because you had twice as many shares, and you owe interest on the margin loan. So, debt makes downside risk worse.

I am certain there are many who went into debt to study Petroleum Engineering, and as of today, August 2016, they have no Petroleum Engineering job, and they have student loan payments. Student loans are the worst kind of loans. They are not dischargeable by a personal bankruptcy process. They will literally follow you to your grave, they will even garnish your Social Security check when you are old. Even after death, student loans can get turned over to private debt collectors who will harass and cajole the grieving survivors to pay off their child's or spouse's student loan. This is illegal - but since when did debt collectors ever care about the law?

If you are specializing in an Oil & Gas field, and attending an expensive private or out-of state university through the use of debt, please transfer as quickly as possible to a more affordable public university where you can pay in-state tuition and possibly avoid accumulating more debt. So much the better if you can live at home and attend university.

If you haven't entered college yet, but you're going to need to use debt - please don't. Do the first two years in a community college setting while living with your parents, then transfer and finish up the last two years of your program at a state university. If you are still early enough in high school where you can influence whether you can do well enough to earn a college scholarship or not; do work very hard and try to get an academic or even an athletic scholarship to a school where you can pursue your studies. My children earned a significant portion of their college costs through scholarships; this made Dad very happy, and helped the family out tremendously.

Does the prospect of living at home during college sound really unattractive? Does it sound like the exact opposite of the independence you seek as a young person?

Consider this. Student loan debt drags your future lifestyle experiences into the present. So maybe you can seemingly "afford" to live on campus or in your own apartment if you use student debt. But then, the debt burden could keep you from having your future experiences in your actual future, where they belong. This is called **BAD ECONOMIC TIME TRAVEL**. You

could be sent back to your parents' home for years after graduation if your gamble does not pay off and you do not find that high-paying Oil & Gas job.

This is precisely what is happening to thousands of new college graduates all across the country, not just those who want to go into Oil & Gas. The percentage of young people in their 20s and 30s living with their parents is the highest it has been since the Great Depression of the 1930s. New household formation is at very low-levels. Marriage and child-bearing are being delayed. The impact on American society of all of this student loan debt is turning out to be profound.

Some sociologists and economists even talk about the "Japanification" of America. Increasingly, in Japan, young people are not dating, not having sex, not getting married and not starting families, and Japanese society is getting older and older. The economy is slowly winding down, particularly because Japan is not a country which welcomes youthful immigrant populations. Japan is getting into a trap of perpetual no-growth. That's really bad. Japan's debt-to-GDP ratio is very high, which is crimping their economic growth; future consumption is dragged into the present by economic debt, but then it can't take place in the future, and the future does arrive, someday. America's debt is not as high as Japan's, but it is swiftly increasing. So do the patriotic thing, and just say no to that student loan!

By avoiding debt, you may need extra years to earn your degree. Did you know that most first-time marathon runners do not run; they do a combination of walking and running? You similarly might not be able to just go to classes for four years continuously and get your degree. You may have to have periods of studying alternating with periods of working at a job, or you may need to work throughout, and take a lighter course load. Whatever you have to do to avoid student debt, as long as it's legal and acceptable within your moral framework, do it.

But after you get your degree without the use of debt, you'll be a free man or a free woman. Every Dollar you earn, net of taxes, will be yours to spend or invest as you see fit. A student loan servicing company will not be harassing you even if you have no job upon graduation or a low-paying job.

And if you do manage to land that high-paying Oil & Gas job, and start your working life with no student loan debt? You will be awesome.

Thank you for reading the free student edition of Financial Survival for Oil & Gas Workers. The full edition will be published as an e-book and a hardcopy paper book at a future date. Please join the Facebook Group “Financial Survival for Oil Workers” in order to be alerted to the publication date.

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