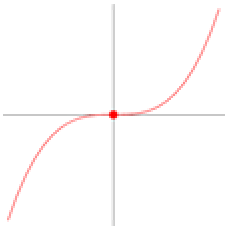
INFLECTION POINTS

applying calculus thinking to major turning points

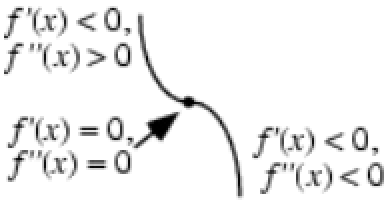


Inflection Points: an introduction

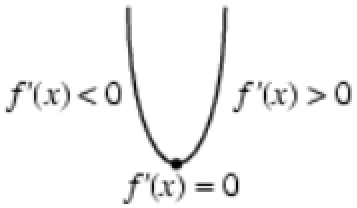
An inflection point is calculus term which describes the points at which the second derivative is zero. On a function curve graph, these are the points when the curve starts changing direction. In contrast, the first derivative helps identify local minima and maxima, or points where the function curve has peaked or troughed. I believe that much of technical analysis of financial markets puts too much emphasis on the first derivative. By the time the force behind a trend has diminished enough for a peak or trough to be easily identified on a price chart by any buffoon, the smart money has already exited. The inflection point may be the first warning of an imminent change in trend.

Calculus principles

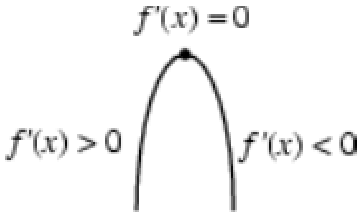
For those without a firm foundation in calculus (include me in that group, please), another way of looking at derivatives is the slope of the tangent. A tangent line of a curve touched it in one, and only one, place. If one takes the slope of that tangent line, this is analogous to determining the velocity, or rate of change, of the curve at that single instant. Unfortunately, markets tend to trend rather than remaining flat, and thus the shape of the curve is constantly changing. Thus, a reading of instantaneous velocity falls far short of giving us the full picture. In a changing world, a brief snapshot of current conditions is not very helpful.



stationary point



minimum



maximum

The second derivative is the tangent of the first derivative – the *rate of change of the rate of change*. Students of physics will instantly recognize this as the definition of acceleration. Velocity is not a discrete variable, but continuous. Velocity cannot go from zero to 100 mph instantly, for this would imply an infinite rate of acceleration, and no physical substance

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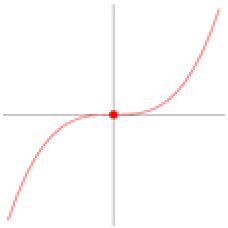

could withstand that kind of g force. Instead, velocity must change at some rate, and the second derivative can help us know this rate.

The third derivative is rarely used, although it has an important corollary with the physics analogy – it is called impulse, and it measures the rate of change of acceleration. Imagine pushing your foot gradually on the gas pedal in a car, rather than all at once to the floor. Yes, it is pretty hard to envision, and thankfully is beyond the scope of this essay, although the third derivative may even warn of major changes even before the second derivative gave rise to a signal. Interested persons – feel free to extend this analysis to incorporate third derivatives.

Investing

All investments are a prediction. The wise investor tries to predict the future – what will the rate of increase be *tomorrow*, not today. Using the distance analogy, this is like saying we want to know what the rate of acceleration is, not the current velocity. My thesis is that studying inflection points will yield better investing results than imply studying the local minima and maxima. The principle behind the use of the second derivative is that this is the point at which convexity changes, or in other words, when acceleration changes from increasing to decreasing. While velocity is still in the positive direction, it is going up at a slower rate, and at some point will hit zero, producing a peak on the function curve. In the stock market, this is the point which most people would identify as the time to make changes in investments – in theory they are correct, but in actuality it is too late. By identifying changes in acceleration, one may be able to foretell future velocity, and make an investment move before the masses attempt this.

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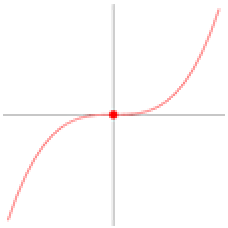

Historical inflection points

This essay is primarily intended to focus on historical examples of inflection points. A review of calculus is beyond the scope, and would not be as interesting anyway. My own interest in studying inflection points is to determine whether useful investment decisions may be made by identifying early signs of important changes. I'd first like to mention several historically important sea changes in opinion. I'm just naming the first few things that come to mind. Could there have been a warning prior to these events? In all cases, I believe the answer is "yes", although for some of the examples one might have to look a little deeper than in others. Some of the changes are political, others focus on public opinion, while others are economic in nature.

- Fall of Roman Empire
- American Revolution
- U.S. Civil War
- Effect of automobile on railroads
- Rise of Nazi Germany
- U.S. Great Depression
- Fall of U.S.S.R.
- U.S. Stock Market Crash of 1987
- Nasdaq market bubble of 1998-2000
- September 11, 2001 terrorist attacks

My major point in this exercise is to demonstrate that major events often thought of as turning points are actually just the culmination of changes that started taking place years or decades earlier. For some of these changes, it is chilling to consider the possible outcomes if those in power had noticed the warning signs of the inflection point and taken corrective steps.

I believe the single unifying concept behind each of these *major* social and economic changes is the failure of those in power to recognize the inflection point. Another way of saying this is that the participants extrapolated their current state of affairs into the future, in a manner of linear thinking. As we alluded in the introduction, linear thinking is similar to knowing what the velocity is, which is not incredibly helpful for avoiding the 10-sigma icebergs when navigating a large vessel – or when managing a portfolio.

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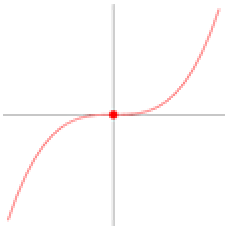


The current 10-sigma icebergs

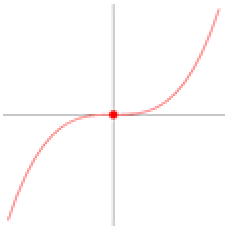
A handful of the icebergs on the horizon currently in the U.S. are:

- Government debt
- Personal debt
- Overcapacity
- Overvalued US$
- Deflationary sources of cheap world labor
- Overpriced equity markets
- Investor complacency
- Aging population
- Impending social security and healthcare debacles
- Costly knee-jerk reactions to terrorism (*perpetual war)
- The transition of the US to a commodity imperialist

I do not believe our leaders are capable of getting past the linear thinking that has created many of these problems. Furthermore, I am worried that a democracy is not conducive to any other type of thinking. The public does not want to debate complex philosophical issues, nor could any leader get elected attempting to do such a thing. And therein lies the problem – *complex issues surround us, but no politician in his right mind dare bring the issues up*. So, rather than address these 10 sigma icebergs through official policy, they will instead be addressed through insidious hyperinflation. (The more cynical among us might conclude that this was the government's plan all along, in which case I'd actually give our politicians a few extra points for having more intelligence than I assumed. But in general, I keep my expectations low, that way I get disappointed much less often.)

Debt is like brush on a ranch. We have an unsustainable level of debt in the country at all levels – personal, corporate, and government. I don't think it can ever be repaid, and even if it were repaid, the cost of doing this in terms of economic production would be disastrous. Yes, I am saying there are no good options. Our country has already borrowed from far into the future, and paying it back is not good for the economy, and shrugging off the debt would not be good either.

The debt needs to cleared and there are two ways of doing it: a **deflationary collapse**, in which the debtors are wiped out in bankruptcy, or an **inflationary surge**, in which the money supply is expanded to the point that debt becomes easier to repay with a devalued



currency. Inflation is traditionally caused by encouraging borrowing with low interest rates, for all monetary expansion occurs through loans in our fractional reserve banking system. If people don't want to borrow (or don't *need* to borrow, due to overcapacity), the government could instead buy up treasury debt using newly printed currency, a process called monetization.

The wise investor, upon recognizing the impending storm, will take corrective action. I believe it is possible to profit from the storm, but don't brag about your winnings – for you will be surrounded by those who lost everything. I believe we'll probably have a bout of deflation first, and the government's knee-jerk reaction to this will be hyperinflation. Thus, both postures will be needed by the portfolio, with an agile shift from deflation to inflation positions. A recognition of the inflection point will greatly assist the portfolio manager in timing the shift.

Like-minded investors wishing to join us in our investment club during these exciting times may request a confidential private placement memorandum. Just use my email address listed below the disclaimer, and I'll be in touch with you.

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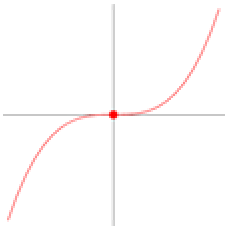

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Sincerely,

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