The Austrians and the Swan:

Birds of a Different Feather

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What is a *black swan event*, or *tail event*, in the stock market?

- ✓ **It depends on who's asking.**

- ✓ **To those familiar with *Austrian capital theory*, the impending U.S. stock market plunge (of even well over 40%)—like pretty much all that came before in the past century—will certainly not be a *Black Swan*, nor even a *tail event*.**

- ✓ **Nonetheless, the *black swan* notion is paramount—in perception: Market participants' failure to expect a perfectly expected event—that is, they price in only Anglo swans despite the Viennese bird lurking conspicuously in the weeds—much like what is happening today, brings tremendous opportunity.**

I. On Induction: If it looks like a swan, swims like a swan,…

By now, everyone knows what a tail is. The concept has become rather ubiquitous, even to many for whom tails were considered inconsequential just over a few years ago. But do we really know one when we see one?

To review, a *tail event*—or, as it has come to be known, a *black swan event*—is an extreme event that happens with extreme infrequency (or, better yet, has never yet happened at all). The word "tail" refers to the outermost and relatively thin tail-like appendage of a frequency distribution (or *probability density function*). Stock market returns offer perhaps the best example:

Figure 1
The Dreaded "Left Tail" of Stock Market Returns
S&P 500 1-year total returns, 1901 - present
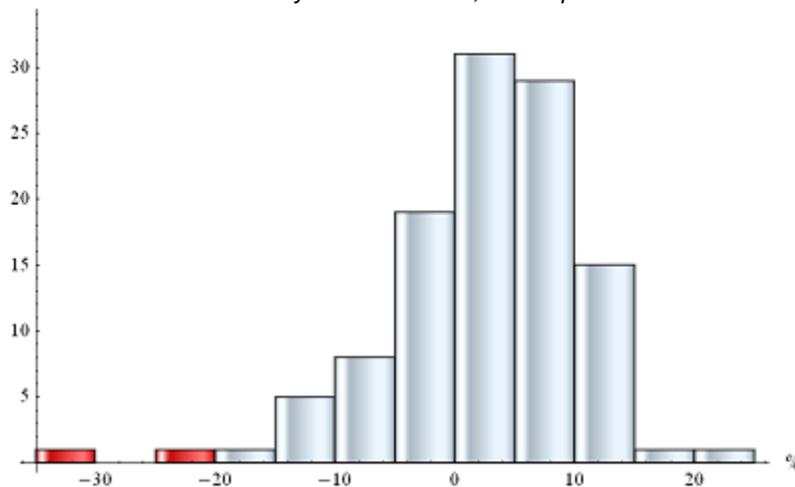
Over the past century-plus there have clearly been sizeable annual losses (of let's say 20% or more) in the aggregate U.S. stock market, and they have occurred with exceedingly low frequency (in fact only a couple of times). So, by definition, we should be able to call such extreme stock market losses "tail events."

But can we say this, just because of their visible depiction in an unconditional historical return distribution? Here is a twist on the induction problem (a.k.a. the *black swan* problem): one of vantage point, which Bertrand Russell famously described exactly one-hundred years ago with his wonderful parable (of yet another bird) [1]:

> The man who has fed the chicken every day throughout its life at last wrings
> its neck instead, showing that more refined views as to the uniformity of nature
> would have been useful to the chicken…The mere fact that something has
> happened a certain number of times causes animals and men to expect that it
> will happen again.
>
> Bertrand Russell, *The Problems of Philosophy* (1912)

My friend and colleague Nassim Taleb incorporates Russell's chicken parable as the "turkey problem" very nicely in his important book *The Black Swan* [2]. The other side of the coin, which Nassim also significantly points out, is that we tend to explain away black swans *a posteriori*,[1] and our task in this paper is to avoid both sides of that coin.

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[1] Nassim's healthy skepticism of data—both forward looking (extrapolation) as well as backward looking (hindsight bias)—is, to this author's thinking, his greatest contribution.

The common epistemological problem is failing to account for a tail until we see it. But the problem at hand is something of the reverse: We account for visible tails unconditionally, and thus fail to account for when such a tail is not even a tail at all. Sometimes, like from the chicken's less "refined views as to the uniformity of nature," what is unexpected to us was, in fact, to be expected.

II. Not Just Bad Luck: The Austrian Case

Perhaps more refined views would be useful to us, as well.

This notion of a "uniform nature" is reminiscent of the *neoclassical general equilibrium* concept of economics, a static conception of the world devoid of capital and entrepreneurial competition. As also with theories of *market efficiency*, there is a definite cachet and envy of science and mathematics within economics and finance. The profound failure of this approach—of neoclassical economics in general and Keynesianism in particular—should need no argument here. But perhaps this methodology is also the very source of perceiving stock market tails as just "bad luck."

Despite the tremendous uncertainty in stock returns, they are most certainly not randomly-generated numbers. Tails would be tricky matters even if they were, as we know from the *small sample bias*, made worse by the very *non-Gaussian* distributions which replicate historical return distributions so well.[2] But stock markets are so much richer, grittier, and more complex than that.

The Austrian School of economics gave and still gives us the chief counterpoint to this naïve vew. This is the school of economic thought so-named for the Austrians who first created its principles[3], starting with Carl Menger in the late 19th century and most fully developed by Ludwig von Mises[4] in the early 20th century, whose students Friedrich von Hayek and Murray Rothbard continued to make great strides for the school.

Ludwig von Mises

Wir sind jetzt alle Österreicher.

[2] Measured tail magnitude and thickness tend to grow with sample size under many power law distributions, for instance.
[3] Ironically, the country of its namesake is decidedly non-Austrian. According to Mises, "Those whom the world called 'Austrian economists' were, in the Austrian universities, somewhat reluctantly tolerated outsiders." [3]
[4] most notably in his monumental tome *Human Action* [4]

To Mises, "What distinguishes the Austrian School and will lend it immortal fame is precisely the fact that it created a theory of economic action and not of economic equilibrium or non-action." [5] The Austrian approach to the market process is just that: "The market is a *process*." [4] Moreover, the epistemological and methodological foundations of the Austrians are based on *a priori*, logic-based postulates about this process.[5] Economics loses its position as a *positivist*, experimental science, as "economic statistics is a method of economic history, and not a method from which theoretical insight can be won." Economic is distinct from noneconomic action—"here there are no constant relationships between quantities."[6] [5]

This approach of course cannot necessarily provide for precise predictions, but rather gives us a universal logical structure with which to understand the market process. Inductive knowledge takes a back seat to deductive knowledge, where general principles lead to specific conclusions (as opposed to specific instances leading to general principles), which are logically ensured by the validity of the principles. What matters most is distinguishing systematic propensities in the entrepreneurial-competitive market process, a structure which would be difficult to impossible to discern by a statistician or historian.

To the Austrians, the process is decidedly non-random, but operates (though in a non-deterministic way, of course[7]) under the incentives of entrepreneurial[8] "error-correction" in the economy.[9] In a never ending series of steps, entrepreneurs homeostatically correct natural market "maladjustments" (as well as distinctly unnatural ones) back to what the Austrians call the *evenly rotating economy* (henceforth the ERE). This is the same idea as *equilibrium*, but, importantly, it is never considered reality, but rather merely an imaginary *gedanken* experiment through which we can understand the market process; it is actually a static point within the process itself, a state that we will never really see. Entrepreneurs continuously move the markets back to the ERE—though it never gets (or at least stays) there. Rothbard called the ERE "a static situation, outside of time," and "the goal toward which the market moves. But the point at issue is that it *is not observable*, or real, as are actual market prices."[10] [7]

Moreover, "a firm earns entrepreneurial *profits* when its return is more than interest, suffers entrepreneurial *losses* when its return is less…there are no entrepreneurial profits or losses in the ERE." So "there is always competitive pressure, then, driving toward a uniform rate of interest in the economy." [7] Rents, as they are called, are driven by output prices[11] and are capitalized in the price of capital—enforcing a tendency toward a mere interest return on invested capital. We must keep in mind that capitalists purchase capital goods in exchange for expected *future goods*, "the capital goods for which he pays are way stations on the route to the final product—the consumers' good." [7] From initial investment to completion, production (including of higher order factors) requires time.

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[5] Mises named this *praxeology*, or the deductive science of human action striving to meet its ends. [4]

[6] Interestingly, despite this skepticism of inductivist methods, observation does play a role in praxeology; as Mises said, "Only experience makes it possible for us to know the particular conditions of action. Only experience can teach us that there are lions and microbes. And if we pursue definite plans, only experience can teach us how we must act vis-à-vis the external world in concrete situations". [6]

[7] Mises spends much time on probability, bifurcating the subject into what he calls "class probability" and "case probability" (similar to Frank Knight's "risk" and "uncertainty" distinctions, respectively), assigning insurance or pooling risks to the former ("We know or assume to know, with regard to the problem concerned, everything about the behavior of a whole class of events or phenomena; but about the actual singular events or phenomena we know nothing but that they are elements of this class.") and economic action to the latter (unrepeatable and lacking quantifiability). [4]

[8] Mises calls *entrepreneurs* (and suggests the more specific term *promoters*) "those who are especially eager to profit from adjusting production to the expected changes in conditions, …, the pushing and promoting pioneers of economic improvement." [4] I combine this function with that of *capitalists* (whom Mises defines as those who own and risk capital) in my use.

[9] what Mises called *catallactic competition* [4]

[10] But our analysis "cannot describe the *path* by which the economy approaches the final equilibrium position." [7] (Later we'll take a peek nonetheless.)

[11] as per Carl Menger's *theory of imputation*

By about one hundred years ago, the Austrians gave us an *a priori* script for the process of boom and bust that would repeatedly follow from repeated inflationary credit expansions. Without this artificial credit, entrepreneurial profit and loss ("errors") would remain a natural part of the process, except that, for the most part, they would naturally happen quite independently of one-another.

Central to the process is the "price of time" [7]: the interest rate market. This market conveys tremendous information to entrepreneurs due to the aggregate *time preference* (or the degree to which people prefer present versus future satisfaction) which determines it and is reflected in it.[12] Interest rates are indeed the coordinating mechanism for capital investment in factors of production.

Non-Austrian economists typically depict capital as homogeneous, as opposed to the Austrians' temporally heterogeneous and complex view of the capital structure. We see this in the impact of interest rate changes. Low rates entice entrepreneurs to engage in otherwise insufficiently profitable longer production periods, as consumers' lower time preference means they prefer to wait for later consumption in the future, and thus their additional savings are what move rates lower; high rates tell entrepreneurs that consumers want to consume more now, and the dearth of savings and accompanying higher rates make longer-term production projects unattractive and should be ignored in order to attend to the consumers' current wants. The present value of marginal higher order (longer production) goods is disproportionately impacted by changes in their discount rates, as more of their present value is due to their value further in the future.

Variability in time preferences changes interest and capital formation. If lower time preference and higher savings and lower interest rates created higher valuations in earlier-stage capital (factors of production) which initiates a capital investment boom, this newfound excess profitability would be neutralized by lower demand for present consumption goods and lower valuations in that later-stage capital. (John Maynard Keynes' favored *paradox of thrift* is completely wrong, as it ignores the effect on capital investment of increased savings, and resulting productivity—and ignores the destructiveness of inflation, as well.)

But there is an enormous difference between changes in aggregate time preference and central bank interest rate manipulation. Where this is all heading: The Austrian theory of capital and interest leads to the logical explication of the boom and bust cycle. To the logic of the Austrians, extreme stock market loss, or busts—correlated entrepreneurial errors, as we say—are not a feature of natural free markets. Rather, it is entirely a result of central bank intervention. When a central bank lowers interest rates, what essentially happens is a dislocation in the market's ability to coordinate production. The lower rates make otherwise marginal capital (having marginal return on capital) suddenly profitable, resulting in net capital investment in higher-order capital goods, and persistent market maladjustments.

Despite the signals given off by the lower interest rates, the balance between consumption and savings hasn't changed, and the result is an across-the-board expansion—rather than just capital goods at the expense of consumption goods. What the new owners of capital will find is that savings are unavailable later in the production process. These economic cross currents—more hunger for investment by entrepreneurs seizing perceived capital investment opportunities, and consumers not feeding that hunger with savings, but rather actually consuming more—creates a situation of extreme unsustainable malinvestment that ultimately must be liquidated.

The only way out of the misallocated, malinvestment of capital, is a buildup of actual resources (wealth) in the economy in order to support it. This could result from lower time preferences (but as we know compressed interest rates actually inhibit savings)—or of course by accumulated reinvested profits over time (but of course time will not be on the side of marginal malinvested capital earning economic losses).

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[12] Time preferences are "psychologically determined by each person and must therefore be taken, in the final analysis, as data by economists." [7]

Credit expansion raises capital investment in the short run, only to see the broad inevitable collapse of the capital structure. Eventually the economic profit from capital investment and the lengthening of the production structure are disrupted, as the low interest rates that made such otherwise unprofitable, longer term investment attractive disappear. As reality sets in, and as time preferences dominate the interest rates again (even central banks cannot keep asset valuations rising forever), projects become untenable and must be abandoned. Despite the illusory signs from the interest rate market, the economy cannot support all of the central bank-distorted capital structure, and the boom becomes visibly unsustainable.

"In short," wrote Rothbard, "and this is a highly important point to grasp, the depression *is* the 'recovery' process, and the end of the depression heralds the return to normal, and to optimum efficiency. The depression, then, far from being an evil scourge, is the *necessary* and beneficial return of the economy to normal after the distortions imposed by the boom. The boom, then, *requires* a 'bust.'"[8]

Aggregate, correlated economic loss—the correlated entrepreneurial errors in the eyes of the Austrians—is not a random event, not bad luck, and not a tail. Rather, it is the result of distortions and imbalances in the aggregate capital structure which are untenable. When it comes to an end, by necessity, it does so ferociously due to the surprise by entrepreneurs across the economy as they discover that they have all committed investment errors. Rather than serving their homeostatic function of correcting market maladjustments back to the ERE, the market adjusts itself abruptly when they all liquidate.

What follows—to those who see only the "uniformity of nature"—is a dreaded tail event.

III. The Stock Market as "Title to Capital": Austrian Investing

In order for the Austrian School's logical market process to help reframe an otherwise surprising negative event in the stock market, we need to somehow understand and track where we are in that process. Our limitations are underscored by a very important tenet of the Austrians themselves: controlled experiments simply aren't possible in economics, and empirically isolating cause-and-effect is impossible. But perhaps, staying close to the principle of parsimony, the systemic distortions that we are seeking can still be rigorously and robustly recognized.

So if we want to distinguish periods of vulnerability to correlated entrepreneurial errors—the busts of the Austrian boom-bust cycle and the losses of the stock market, and thus recognize *ex ante* when such loss is no longer a tail event—we just need to recognize the periods of monetary credit expansion and resulting malinvestment. This isn't necessarily all that easy, which the Austrians know well.

The natural approach should be to use the earlier *gedanken* tool of the fictional ERE and identify clear deviations from it. Recall the homeostatic entrepreneurial mechanism always at work which "smooths fluctuations and facilitates movement toward equilibrium," [8] the aggregate entrepreneurial "goal" [7] of a mere interest return on invested capital. But we cannot observe an ERE, since it doesn't even exist. Instead, we can observe what I'll call the "aggregate ERE"—where "there are no entrepreneurial profits or losses" [7] in aggregate. In aggregate, it will look the same, and what it will tell us is functionally the same: What entrepreneurs (on aggregate) are doing and where they are heading.

We need a robust indication of when aggregate capital productivity, or aggregate return on invested capital—as capitalized in the price of capital—suddenly and persistently and inordinately exceeds or is below the cost of that capital: interest rates. As we know from the previous section, this is unique to a monetary credit expansion. Changing time preference won't widen or narrow this spread from the noise of the ERE (recall that, in the case of higher savings, lower demand for consumption goods would ultimately offset higher demand and valuations in capital goods); innovations or productivity gains shouldn't either (at least not very much, as "the sovereign consumer" [9] will

ultimately steal those gains). Only central bank interventionism will accomplish this. All maladjustments, however, require an eventual return.

So a robust indicator of this spread will offer us information on where we stand in any central bank-induced boom-bust market process, or more specifically where entrepreneurs are most vulnerable to sudden and inevitable correlated errors.

Conveniently, as Rothbard noted, "the stock market is the market in the prices of titles to capital,"[13] [8] and "at any point in time the capital value of a firm's assets will be the appraised value of all the productive assets, including cash, land, capital goods, and finished products." [7] As the expected productivity of capital is immediately capitalized in those title prices, and as the net tangible capital in place is part of a complex temporal capital structure with drawn-out production processes that adjust very slowly, how those aggregate prices of title to capital compare to the aggregate current net tangible replacement value of that capital in place must tell us something about the anticipation of aggregate profit. When the ratio is high, titles to the factors of production are being bid up by entrepreneurs as capital investments in higher-order goods grow and malinvestment accumulates; when the ratio is low, of course, the reverse is happening.

Conveniently, this ratio exists in the equity Q ratio[14]:

$$Q \approx \frac{Value}{IC} = \frac{ROIC - g}{WACC - g}$$

I have covered this measure in some detail (from a corporate finance as well as empirical standpoint) in a previous paper titled *The Dao of Corporate Finance, Q Ratios, and Stock Market Crashes* (see link here) [10], so I'll spare you the gory details. But it should be obvious that Q indicates in a very robust way the implied spread between aggregate return on invested capital and the aggregate cost of that capital.[15]

Figure 2
The Equity Q Ratio
1901 – present

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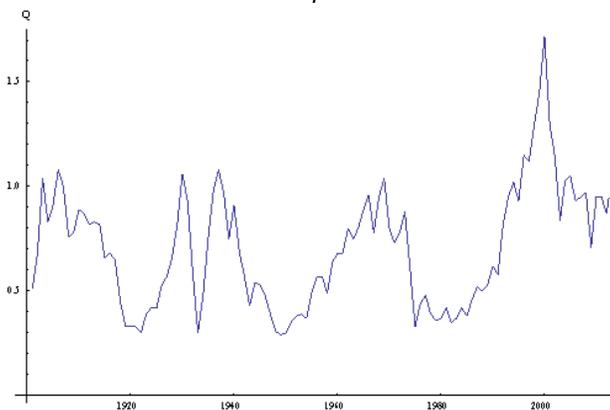
[13] And of course "real estate is the other large market in titles to capital." [8]
[14] This is related to Tobin's Q ratio of James Tobin [11], which is the ratio of aggregate enterprise value (equity plus debt) to the aggregate corporate assets or invested capital; I am using the equity Q ratio in this paper, which is just total equity over the net worth of the firm—where total assets are netted against total debt, so with no debt the net worth is the invested capital.
[15] See [12].

As discussed in the previous section, to the Austrians, stock prices are not just random fluctuations, and their losses are not random losses. In the above history of the Q ratio, there is visibly both an attractor at work in the ERE and a source of large perturbations in monetary policy. In each cycle, "businessmen were misled by bank credit inflation to invest too much in higher-order capital goods, which could only be prosperously sustained through lower time preferences and greater savings and investment; as soon as the inflation permeates to the mass of the people, the old consumption/investment proportion is reestablished, and business investments in the higher orders are seen to have been wasteful"[8] (i.e., the aggregate market for title to capital—much of which capital have returns which are suddenly below their costs—plummets.) High Q periods are periods of "wasteful malinvestment," and "the adjustment process consists in rapid *liquidation* of the wasteful investments." [8]

So what becomes of the tails when we condition on Q? Despite the Austrians' warning that the path back to the ERE is inherently unpredictable, we should nonetheless expect to see regularities which reflect the extreme entrepreneurial vulnerabilities with higher Q:

Figure 3
Swan Song for the Tail:
When Q Is High, Large Losses Are No Longer a Tail Event, But Become an Expected Event
Median and 20th percentile (with 99% confidence intervals) of S&P 500 3-year total return maximum drawdowns
Conditional on quarterly Q ratios, 1901 - present
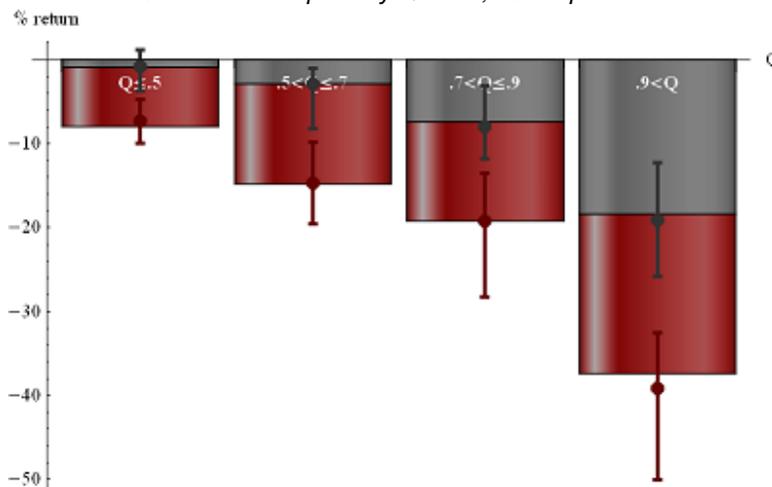
Without a doubt (or at least with over 99% confidence[16]), bad things happen with increasing expectation when conditioning on higher Q ratios *ex ante*. That is, when Q is high, large stock market losses are no longer a tail event, but become an expected event.[17]

Basic corporate finance principles are enough to explain the entrepreneurial forces at work to drive the convergence (and empirical mean reversion) of the Q.[18] But it is very difficult to rationalize the intermittent divergence without monetary arguments and the temporal complexities of the capital structure.

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[16] This is the same study I showed in [10], and for more detail on the data and methodology—the distribution-free, non-parametric bootstrap methodology used in [13]—I refer the reader there.
[17] In options speak, if a 20% down strike is a "50 delta" (that is, it has a 50% likelihood of expiring in-the-money), it is the at-the-money strike—certainly not a tail. (In fact what is happening is the whole distribution of returns is shifted downward, as well as increasingly skewed.)

Clearly, time is required before "the end of inflation could reveal the widespread malinvestments in the economy, before the capital goods industries showed themselves to be overextended, etc." [8] Again, the path back to the ERE—including the time it will take—will always involve uncertainties. But, again, there are regularities in this "stopping time" to liquidation:

Figure 4
Ticking Time Bomb:
Stopping time for S&P 500 to drop 20%
Median (with 99% confidence interval) number of months
Conditional on quarterly Q ratios, 1901 – present
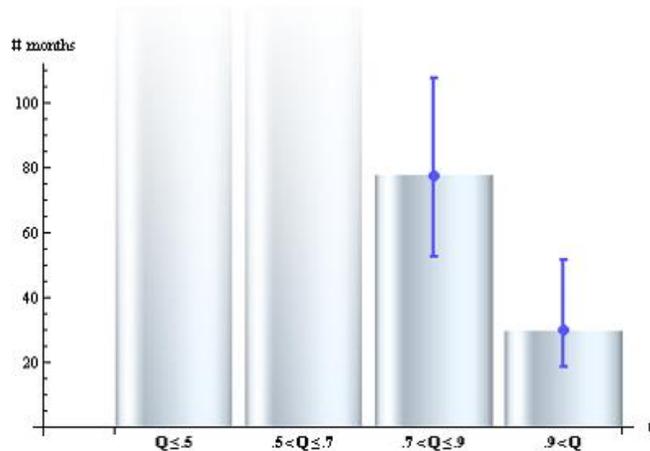
Again I use the non-parametric bootstrap methodology of [13].

The question is not if, but when.[19] And, in fact, though not surprisingly, the majority of the losses tend to happen in a rather concentrated plunge at the tail end of the path down to minus 20%; for instance, in just the last two months before the market passes through our 20% drawdown trigger, it typically (on average) has experienced a loss of nearly the entire 20%.

I see in these studies—in the deviations from the ERE, and in the violent shifting of capital back and forth into higher and lower stages of production with assumed changes in time preference, and with the surprising empirical regularities thereof—a tremendous century-long out-of-sample test[20] of the deductive *a priori* Austrian capital and interest theory; and we must certainly fail to reject the theory's validity.

What would the assumption of the validity of these ideas and the reframing of tails have done for someone starting in 1913 (at the birth of the Federal Reserve) in the U.S.?[21] There would have been moments of time when, with an understanding of the recovery process and the purging of distortions, aggressive investing would have been much

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[18] Tobin's presumption that Q would drive capital investment was backwards, as title to that capital drives the Q; Q levels have only a mild pull on the slow process of production goods accumulation, but Tobin's understanding of the error correcting nature of the entrepreneur was correct.
[19] The current age of upper quartile valuation for the U.S. stock market is just above the median of 30.
[20] truly free of hindsight bias
[21] In Vienna in mid-1929, for instance, we know that Mises decline a position with Kreditanstalt, declaring, "A great crash is coming, and I don't want my name in any way connected with it."

easier to stomach.[22] At other times, as the *ticking time bomb* is anticipated,[23] stepping aside during the entrepreneurial scramble for capital investment (though hopefully avoiding shorting that investment, a most hazardous act indeed[24]) would have been perhaps somewhat easier—despite the frequent extreme opportunity cost (though longer term advantage) of doing so.

Austrian economics, with a little bit of data sprinkled in, makes the case clear: There haven't been black swan events of significance in the aggregate U.S. stock market over the past century; more alarmingly—due to the evident monetary credit expansion today—we would be hard pressed to be surprised by severe stock market losses now.

Fortunately, most people (at least in the equity derivatives markets) disagree.

IV. Blackbirds Baked in the Pie

To me, this apparent intellectual nitpicking over the distinction between what is a tail and what isn't a tail is rather important. In fact the black swan notion is paramount—in perception. If the market perceives (or rather prices) a large loss in the stock market as a tail event even when such perception (and pricing) is unwarranted, obviously tremendous opportunity exists—even if only to protect a portfolio against such deleterious losses.

One would think that the ubiquity of black swan consciousness (among the press and pundits, but presumably also among investors) would bring with it a heightened cost of "tail insurance." Furthermore, aren't Austrian economists overrunning the derivatives markets in a panic over their anticipation of sudden and rampant liquidations?

The answer is clear from the below chart of the S&P 500 variance swap market (a pretty good proxy for the price of tail hedging,[25] by duration of the tail hedge), both current and an arguably similar if not more benign environment five years ago:

Figure 5
Keine Angst (at least in the short run):
Variance Swap Levels, S&P 500
Current and **5-years ago**, by years to maturity

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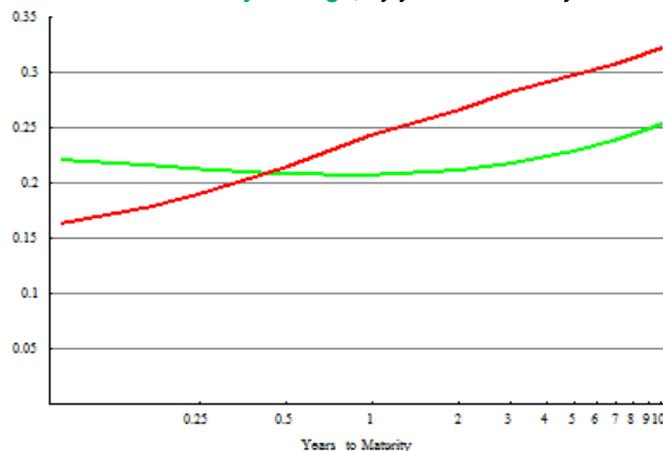
[22] Let us remember, this is not simply a doom and gloom approach. It is just as likely to be a tremendously opportunistic optimistic approach—specifically when malinvestment is being liquidated and the Q becomes lower. Capital is not destroyed, but rather title just changes hands at more advantageous prices to the buyer.
[23] and there is much noise around these median stopping time estimates
[24] the beauty of options
[25] In terms of put premiums, think of this as tracking the *implied volatility* of very roughly a *25 delta* put.

Clearly, though inexplicably, there is little fear in the pricing of 1 to 3 month options,[26] which are cheaper than five years ago and even beyond.[27] (There is, however, great fear in the typically suboptimal long-dated protection space.[28])

But if the derivatives markets were showing much fear, wouldn't this be perfectly inconsistent with the illusion of lowered aggregate time preference and thus greater attractiveness of longer-term capital investment in the first place? Monetary credit expansion is ultimately based on this fundamental illusion, and for the illusion to end—which would include an acceptance of most of the content of this paper by the marketplace—it would mean the recognition of accumulated malinvestment and its necessary liquidation. For the potential failure of the illusion to be perceived—including in the equity derivatives markets—as anything other than a black swan event would mean the collapse of the very illusion in the first place.[29]

An extreme loss in the stock market is indeed priced in much (though not necessarily all) of the equity derivatives markets as an extreme tail. I cannot explain why this is—why a tail is still a tail—just as I cannot explain why the Austrian School remains (despite a century of evidence) the "somewhat reluctantly tolerated outsider." [3] But, as the two are in fact one in the same, here too we should not be surprised.

V. The Eagle Has Landed

The epistemological problems of black swans and tails are significant; from the face of it, it is impossible to come close to predicting or even understanding the properties of the most severe and rare events by extrapolating what we have already seen. There is a fundamental illusion at the heart of this problem, a distributional illusion which can be shattered in an instant.

To me, "tail hedging" mainly addresses a very different (and even more severe) epistemological problem: the economic illusion created by monetary policy, which often takes long periods of time to wear off but, when it does, suddenly reveals the extreme entrepreneurial errors of malinvestment which lead to sudden rampant liquidation of capital.

This monetary illusion addresses the tail illusion, as disregarding the former in fact causes the latter.

Some may find this paradoxical coming from me: From my view, empirically and from an *a priori* Austrian interpretation, black swan events have been largely insignificant in at least the last century of capital investment in the U.S., including the current crisis.[30] Investors have indeed encountered surprising and pernicious events, but the fact

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[26] where heightened valuations would be expected, for reasons of the *ticking time bomb* of *Figure 4*, among others
[27] Clearly, one needn't agree with the Austrians in order for tail insurance to make sense. This is especially the case at this pricing. As the previous section makes clear, the prices of titles to capital tend to climb with monetary credit expansions, until they don't. Many see tail hedging as a way to remain long, perhaps even in a levered way, despite otherwise unacceptable uncertainties.
[28] If there is a blatant trade idea in this paper, it might just be to sell five year variance (or better yet a five year butterfly).
[29] This consistency in pricing explains the tendency for premiums in the options markets to generally diminish with rising Q ratios. The Austrian case simply does not get "baked in the cake," at least not before it is imminently obvious and too late. The Krugman/neo-classical case (for monetary credit expansion), despite a perfect record of failure, apparently does.
[30] Of course this does not mean that catastrophic, free market capitalism-destroying events—either manmade or not—couldn't have happened (and the manmade variety has historically been entirely related to the interventionism explored in this paper). We are dealing with the realm of entrepreneurial action within a competitive economic system and the monetary distortions which affect it. But note that during the one-hundred-plus years of this study there was much devastating unprecedented world conflict, which managed to still be subsumed by Austrian praxeological principles.

is those who were surprised have essentially been those (in the extreme majority) with a brazen disregard for the central concepts of Austrian capital theory and monetary credit expansions; that is, capital goods and the time structure of production

To the relentless willingness by most investors (as witnessed through my career, and indeed for at least the past century) to repeatedly price in the almost certain success of inflationary credit expansion, I owe my past and future success in betting again them; that is, betting on their assumptions about what are rare events.

Mises' great insight was that the foundation of material civilization is the entrepreneurs' patience in refraining from consuming a portion of their produced goods and returning it to the drawn-out production process. Only savings—that is, foregone consumption—creates capital goods and wealth. "Those saving—that is consuming less than their share of the goods produced—inaugurate progress toward general prosperity. The seed they have sown enriches not only themselves but also all other strata of society." [14]

Don't let Bernanke tell you otherwise. The Fed has in fact made this process much harder and much more treacherous, as we have seen, as capital structure profitability becomes highly illusory.

The great Austrian tradition and the market forces it elucidates in its *a priori* methodology for economic understanding provides an equally important, though unappreciated, methodology for investing.

It seems to me that "tail hedging", as I've been practicing it for about 15 years now (and I dare not speak for any others who are so new to the game), could be called "central bank hedging"—or, better yet, "Austrian investing."[31] Indeed, this activity over my career likely would have been much less interesting without the insights of Dr. Mises and the actions of Drs. Greenspan and Bernanke.

Danke schön, meine Herren. Wir sind jetzt alle Österreicher.

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[31] I have yet to have read about aggregate equity valuations vis-à-vis aggregate corporate net worth as the telltale sign of the Austrian business cycle at work, as well as an indication of location in that process, and I hope it becomes an investing offshoot of this great tradition.

Appendix: References

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