

Toxic Bloom

How the unexamined dangers
of ETFs threaten investors and
the efficiency of markets

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TAYLOR FRIGON
CAPITAL MANAGEMENT LLC

At Taylor Frigon Capital Management, we believe that the best way to achieve long-term investment success over many years is by using a time-tested and disciplined process to evaluate potential individual securities and build portfolios which directly hold those individual securities.

In the nearly thirty years that we have been using that process, we have seen many different products created and marketed by the financial industry which purport to offer a better approach for the average investor.

We realize that not everyone believes the same thing about investing, and so we generally tend to tell those who ask about such products that we believe in our system, but “to each their own”.

However, in recent years a new addition to the long list of products that have been dreamed up by the financial industry has grown to great prominence and gives us cause for greater concern.

It’s not an organic product – it was specifically created by financial engineers, and it can only grow by a rather arcane process involving specially-designated industry participants moving large amounts of money and placing large numbers of securities in trust. By its very nature and the way it was engineered when it was designed, it needs to create a lot of trading volume just to function in the financial markets.

The financial engineers who invented this product and began floating it out into the markets in the early 1990s (at “eye-dropper” levels compared to its current size) also designed it to have strengths at the very points that seemed to be weaknesses in many of the previous investment products that the financial industry had come up with in the past.

This new product actually is very strong in those areas – but there is evidence being discussed in academic papers which seems to indicate that the specific way that this type of synthetic security is structured may have negative side effects that impact the entire ecosystem, creating costs that everyone ends up paying, not just those who choose to add it to their own investment accounts.

In fact, we have reason to suspect that this fast-growing product may threaten some of the core functions of the markets themselves, functions that are vital to all investors as well as to the companies who depend on those markets for their capital structure and for access to the capital that they need to grow and to operate on a daily basis.

What is this fast-growing mechanism that we are discussing in such sinister terms? How could it have escaped notice from investors for so long, if it is indeed so threatening?

It hasn’t escaped notice at all – you’ve probably “seen” it on TV (or at least heard it being discussed) plenty of times, and read about it in the pages of the most respected financial journals and books, almost always in very positive terms. If you noticed how big it was in the financial industry, you probably thought that its expansion was completely harmless, and probably even a beneficial development.

You may never have heard anyone raising an alarm about possible negative side effects at all.

Because the fast-growing financially-engineered synthetic product that we are talking about is the exchange-traded fund, or ETF.

We believe that this relatively new and phenomenally popular investment product poses a potential threat to investors and perhaps to the efficiency of the market mechanism, and ultimately to true price discovery.

We also believe that because it is a very complicated product which is marketed using simplified descriptions, those who buy ETFs (and even many of those who sell ETFs) tend to understand them less completely than they should, leaving unexamined potential problems of a very serious nature.

For those who have heard nothing but good things about the ETF, such assertions may come as a shock. The ETF as a financial product has had almost unprecedented success and exponential growth in investor assets. First marketed in 1993, by the year 2000 there were still only about \$72 billion of assets invested in ETFs worldwide, according to the *Investment Company Factbook*¹. Today, according to the same sources, the number has grown to \$2.7 trillion of assets in ETFs worldwide, with about \$2.0 trillion of that in US ETFs alone².

That is a staggering increase in assets committed to these particular vehicles. The advantages of ETFs which have helped lead to that enormous growth in assets include:

- the ability to gain exposure to dozens or even hundreds of different securities from multiple issuers (“diversification”) in a single investment instrument (which is also an advantage of a mutual fund),
- the ability to trade that investment instrument throughout the day on exchanges in the same way that a stock can trade throughout the day on exchanges (which is not a characteristic of a mutual fund, which is priced at the end of each trading day),
- the ability to short the security and hedge the security with options in much the same way that stocks can be shorted or hedged (which is also not a characteristic of a mutual fund, which cannot be shorted or hedged with traditional puts and calls and other stock option strategies),
- and, one of their most widely-marketed features, and perhaps their most important selling point: the ability to offer all of this at an extremely low annual fee, usually well under 1% per year and often less than 0.50%. The average ETF charges 0.44% per year, according to data published in the *Wall Street Journal*.³

The reason this last point is so important is that it opens a window into the internal workings of an ETF. All previous financial instruments which gave investors exposure to multiple different securities from different issuers (diversification) through the ownership of a single security (the first point in the list above) necessarily charge a fee in order to offset the costs of keeping track of the investment assets as they are allocated to all those securities and the other operational costs of buying and selling those securities, and to compensate the managers who select and manage the portfolio.

These fees are not present when an investor owns an individual stock, for example, but an individual stock does not have the advantage of the first point in the list above (although, generally, it can be shorted and hedged and traded throughout the day on exchanges).

However, because of the unique synthetic aspect of the exchange-traded fund, which will be described below, ETFs do not require the same kind of operational costs and management costs that previous instruments designed by the financial industry to provide that first advantage listed above (including mutual funds, and even traditional index mutual funds) necessarily have. Because of this, ETFs could be offered for a much lower annual fee.

Individual stocks or bonds, of course, have no annual fee, but they do not give diversification in a single security: if you want diversification with individual stocks or bonds, you have to construct a portfolio of different stocks and bonds issued by different companies.

So, the ETF basically gives the investor diversification in a single security, but without the drawbacks associated with previous vehicles – such as mutual funds – designed to give diversification from a single security (there are also some tax drawbacks associated with mutual funds which we have discussed in previous whitepapers, and which the ETF structure does not have). An ETF *seems* to give many of the benefits of the mutual fund, but in a vehicle that has some of the benefits of an individual stock.

Unfortunately, in order to obtain that unique mix of strengths, the ETF has to give up the one benefit of an individual stock that we believe is the most important: direct ownership of a share in the business that issued that stock.

In a mutual fund, which does have some structural drawbacks which we acknowledge and write about elsewhere, the investor still has direct ownership in a share of a pool that owns the stocks or other securities in the mutual fund portfolio. This fact results in the higher operational fees which mutual funds generally have to charge, because they have to keep track of investor dollars going in and out, and keep track of the percentage of ownership (as well as percentage of capital gains or losses, cash dividends, votes, and other aspects of ownership) to which each investor in the mutual fund is entitled.

In the ETF, the investor has no direct ownership in the underlying securities at all. He or she has ownership in a synthetic instrument which is tied to the security portfolio by a complex process of financial engineering – and which does not give ownership in the securities in the portfolio at all. The price of the ETF is linked to those securities in the portfolio only

through trading – in fact, only through *arbitrage*, which many investors in ETFs might not even be able to properly define (although they will be able to define it by the time they have finished reading this whitepaper).

This fact – the fact that the structure of the ETF distances the investor from ownership in the securities issued by an actual business – lies at the very heart of our disagreement with the recent rush to make ETFs the new foundation for so many investment strategies. We believe it is the central problem which gives rise to all the potential hazards discussed below – potential hazards to individual investors, but also potential hazards to the entire investment system.

As a counter-weight to the list of the widely-marketed and fairly well-known “positive features” of the ETF listed above, we offer the following list of their potential “negative aspects”:

- They replace an investor’s ownership of securities issued by a business with a synthetic vehicle linked to securities by a process of financial engineering.
- This distancing of the investor from the portfolio of securities that the ETF is supposed to be tracking lowers the perceived need to scrutinize the securities in the underlying portfolio: in other words, it breeds complacency on the part of the typical investor in the ETF. Even an unsophisticated and relatively uninformed investor in an individual stock, for instance, acknowledges that *someone* should be performing careful analysis on that stock: with an ETF, many investors seem to believe (mistakenly, in our opinion) that careful ongoing analysis of the underlying securities and the companies that issue those securities is less necessary, or even entirely irrelevant. There have been attempts to create “active ETFs” which track a portfolio of securities selected by a manager rather than an index or market segment – but even after several years these have less than 1% of all ETF assets, and the majority of them own securities other than stocks.⁴ We suspect that many active managers would prefer to manage portfolios in which the trading is not driven primarily by arbitrage activities.
- Because arbitrage by its very nature requires liquidity (in more ways than one), a temporary liquidity shortage could lead to the price of the ETF decoupling from the portfolio of securities it is supposed to be tracking.
- Because such disruptions in liquidity typically coincide with market declines (and especially with market panics and market crises), the likelihood is that this decoupling would take place on the downside, leaving investors in an ETF wishing their investment had “only” gone down as much as the securities they thought their ETF was tracking went down.
- The creation of ETFs involves a complex process in which securities are placed into trust and exchanged for “creation units.” Only large financial firms known as “authorized participants” are allowed to participate in this “creation/redemption” process (which also requires significant buying power on the part of the authorized participant). This “partitioning” of the creation/redemption process creates a host of potential problems, one of which being the division of the market into those who can participate in the arbitrage opportunities that arise from this financial engineering, and those who cannot. The bigger problem is that as more and more ETFs own a security, a larger percentage of the daily trading activity in that security is done for the purposes of ETF creation and for price-arbitrage plays, and a smaller percentage for fundamental reasons related to the business of the issuer of that security.
- Because of this the demand for actual fundamental research and analysis falls market-wide: academic studies show that greater ETF ownership of a stock can lead to the eventual reduction of the number of analysts following the stock (and the same might logically be assumed to be taking place for other kinds of securities included in ETFs, such as bonds and other debt instruments).
- The reduction in demand for fundamental analysis, and the reduction in the amount of fundamental analysis being performed, could logically be seen as impairing price discovery and lowering the efficiency of the market. While inefficiencies can have an upside (for investors who believe they see something in a stock that others do not fully appreciate, for example), in general the reduction of the demand for good fundamental research, and the consequent fall in the quantity and quality of fundamental research will tend to “dumb down” the entire market. Outstanding stocks will have a harder time getting recognized; egregious problems may slide by more easily. The overall quality of the investing scene decreases, just as we might imagine a real drop in quality of education in a school system in which no outstanding pupils or no struggling students ever receive any attention, because all the teachers are too busy playing lotto in the teacher’s lounge. We believe it is quite possible that there is at least some connection between the unhealthy malaise that seems to have infected the markets since 2000 and the absolutely mind-boggling growth in the dollar amounts of assets invested in ETFs over the same period.

- Academic studies have also found evidence that the growth of ETFs in a market drives up the cost of trading securities in that market, by increasing the spreads. This is a little more difficult to intuitively understand (in fact, it seems counter-intuitive on the face of it), but it is yet another consequence of the “partitioning” of the market, and as more and more securities from any issuer find their way over to the ETF side of the partition (which excludes all investors except for the “authorized participants”), the efficiency in the market for the remaining securities that are not in the “private party” (the ones left out of the club) will decrease, the gaps in the prices between trades will increase, and the entire market will be thinner. As ETFs grow larger and own more shares, then more trading of shares will be done by ETFs (which trade for reasons other than fundamental analysis of the shares), and less by those who own the shares outside of ETFs. When fewer shares are available to investors outside the ETFs, then the “competitive pressure” for those fewer shares will be proportionally greater, which can create less liquid and less efficient markets (with larger price jumps or “gapping” when a non-ETF buyer or seller wants to place the next trade).
- Ultimately, the reduction in demand for analysis, the reduction in analysts conducting fundamental research on securities, and the rise in trading that is related to synthetic ETF creation and price arbitrage, dampens or hampers the entire process of *price discovery* – one of the most important functions of a market in the first place.

This list of potential problems with ETFs, in our opinion, seems to more than offset their list of benefits. These are potentially serious problems for ETF investors, but it is clear that they are also potentially very serious problems for the entire market, and for all investors (as well as for companies, which rely on those markets for capital and for other critical business functions).

In other words, ETFs made their fortune primarily on the promise of inexpensive and safe investing for everyone. But it is quite possible that they have very serious hidden costs: hidden costs which everyone is paying, whether they own ETFs or not!

Also, although ETFs are often marketed as a kind of panacea for “the little guy,” and a way to escape the “big Wall Street fees,” a close look at the actual mechanisms that create these synthetic products shows that big financial firms that create and trade ETFs and which act as the authorized participants are making enormous profits from the trading and other activities which ETFs require by their very structure. And so it is also accurate to say that, for the illusion of “low costs for ETF investors,” everyone is actually paying a potentially huge price, while big financial-industry players make big revenues from trading and related activities.

Let’s have a look at how the ETF structure creates such a hazardous situation for investors.

We’ll begin with a description found on the website “[ETF.com](#),” a company which provides educational articles and publications focused on ETFs and which offers analytical tools and statistics related to ETFs, hosts ETF events, and generally advocates for ETFs. They are openly positive on ETFs and advocates of the ETF concept in general (“The website is called ETF.com. As you might expect, we like ETFs,” [one of their articles](#) on a comparison between the ETF and the open-end mutual fund as an investment vehicle tells the reader, which is commendable transparency). Their articles are well-written, their staff has been involved with ETFs since 2001 (when the ETF as a vehicle accounted for a very small percentage of overall investments), and the biography of their CEO says that anchors on CNBC refer to him as the “Master of All Things ETF”.

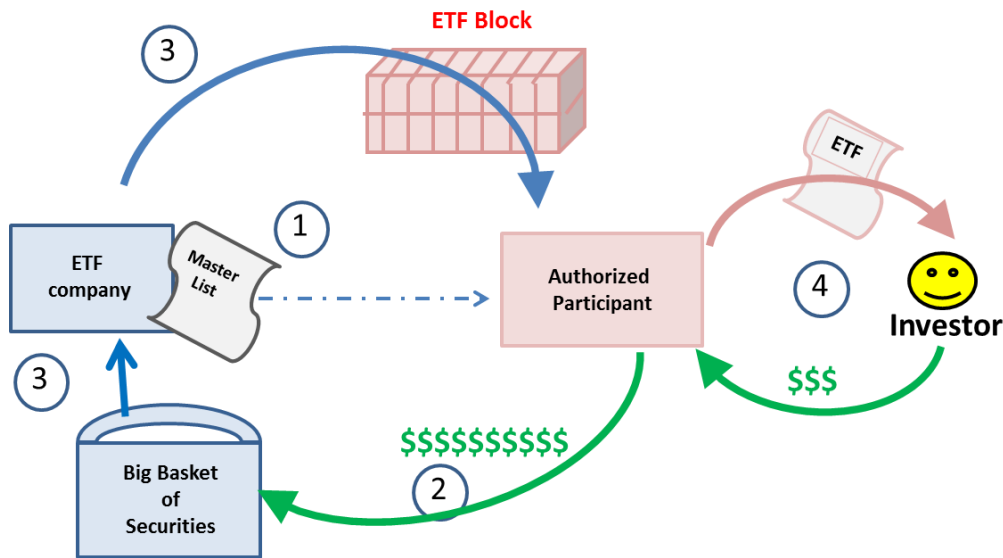
This site does a good job of explaining ETFs in non-technical language, defining terminology that is specific to the financial-industry. We could also refer the reader to much more technical papers on ETFs and to published academic studies of ETFs which generally show the same fundamental aspects common to the creation and redemption and sale of ETF shares. But, since the description on their site is clear and accurate, we will quote their discussion and then illustrate it with our own diagram. They write:

“When an ETF company wants to create new shares of its fund, whether to launch a new product or meet increasing market demand, it turns to someone called an authorized participant (AP). An AP may be a market maker, a specialist or any other large financial institution. But essentially, it’s someone with a lot of buying power.

It is the AP’s job to acquire the securities it wants to hold. For instance, if an ETF is designed to track the S&P 500

Index, the AP will buy shares in all the S&P 500 constituents in the exact same weight as the index, then deliver those shares to the ETF provider. In exchange, the provider gives the AP a block of equally valued ETF shares, called a creation unit. These blocks are usually formed in blocks of 50,000 shares.”⁵

Based on the above description, that generally describes the basic ETF structure, we could diagram the process just described as follows:



1. An ETF company or provider has a “master list” of securities, which it provides to an AP.
2. The AP buys a big “basket of securities” to match the list (the AP has a lot of buying power, so it does not need to wait for investor dollars to buy these securities – it will get around to those later on).
3. A kind of “swap” takes place in which the AP gives the basket to the ETF company (or their custodian, depending on the exact trust or investment company structure of the ETF provider), while the ETF provider gives the AP a “block” (typically in units of 50,000) of shares of the ETF in question, which the AP can then sell to investors.
4. The AP offers the ETF to investors; the investor gives funds to the AP to buy shares of the ETF.

Now, before we go any further, let’s just point out that the investor owns what is represented as a sort of “slip of paper” that says “ETF” on it (in reality, it is a line in an account somewhere, but we can think of it as a paper that says “ETF”).

The investor does not own “shares” in a “basket of securities.” The AP bought those securities, gave them to the ETF provider in exchange for a “block” of ETF shares, and then the ETF company put the shares in an account held by a custodian.

If the big basket of securities that the AP handed over in exchange for the block of 50,000 shares of the ETF was valued by the market at \$5 million, then the block of 50,000 ETF shares would have to be worth \$5 million, which means that each share should be worth \$100.

But, once those ETF shares get out on the market and start trading between investors, their market price will naturally start to go up and down based on supply and demand. If demand for them suddenly goes up for some reason, the price of the ETF share itself may become higher than the net asset value of the securities in the “big basket of stocks” that the ETF is supposedly “linked to.”

When something like this happens in a liquid marketplace, we have what market professionals will recognize immediately as an “arbitrage opportunity” – an opportunity to buy something in one place at one price and immediately turn around and sell it in another place for a different price, which gives you the ability to make money just for figuring out that there’s a “gap” that you can exploit, and then exploiting it.

In this case, because the people working at the AP realize that the ETFs on the market are trading at higher than they can get in the “swap” (number 3 in the diagram), they want to sell as many of those ETF shares as they can for as long as that arbitrage exists. In fact, they will even do what experienced market participants know as “shorting” the ETFs, which is to say “selling them before you even buy them,” or “placing bets that their price will drop.” Eventually, all this shorting and selling will drive the price of the ETFs down and the arbitrage opportunity will dry up, and the AP will stop shorting and selling.

At the same time, another way that the AP could decide to take advantage of the “price mismatch” (the arbitrage opportunity) would be to buy shares of the securities in the “big basket,” because it can exchange these shares for ETF shares that it can turn around and sell for more than what the AP had to pay to put together the basket of securities. This is just the other half of the arbitrage opportunity – and of course, all that buying pressure would eventually drive the price of those stocks up until the “gap” closes and the arbitrage opportunity goes away.

In reality, the AP is going to do both as fast as it can, every time it sees an arbitrage opportunity. If the ETF price gets ahead of the value of its basket of securities, the AP (who has the privilege of buying the stocks to fill up the baskets, and of swapping those baskets for blocks of ETF shares, which it then sells to investors) is going to start buying stocks to fill baskets, and at the same time it is going to start “shorting” the shares of the ETF. It makes a nice little arbitrage profit for as long as it takes to close the gap.

If the situation goes the other way, with the market price of the shares of the ETF dropping below the net asset value for the baskets of securities that APs construct when swapping for blocks of ETF, then the AP is going to start arbitraging the other way – buying up ETFs on the open market or shorting the stocks in the basket. It’s easier to envision how this works when the ETF market price gets above the NAV of the stocks in the basket, but it really works just the same for either type of arbitrage.

Meanwhile, the investor has a bunch of shares of the ETF which really have no direct connection to the big basket of securities. Their connection to the basket of securities, as you might have gathered from the above discussion, is maintained by one thing and one thing only: the trading activity of the Authorized Participant, as it participates in the “creation/redemption mechanism,” which it does whenever it spots arbitrage opportunities and trades as fast as it can in order to take advantage of the gaps until they close again.

You can see from the foregoing discussion that the ETF is a synthetic derivative, which distances the owner of the ETF from the actual securities, and inserts a layer of trading activity being done at big financial firms in between the investor and the securities issued by companies.

And that’s just a description of what some industry participants and academic observers call “plain vanilla” ETFs – ETFs in which there actually is a basket of securities somewhere. There are ETFs which are even more synthetic than the derivative structure just described, which don’t even purchase the securities themselves but instead gain their exposure to those securities through derivatives, creating yet another layer of distance between the investor and real securities issued by real businesses.

As mentioned in the list of potential drawbacks, the derivative structure of the ETF and its reliance upon trading and arbitrage open it up to the possibility for liquidity shocks.

In periods of major market disruption, when liquidity becomes scarce even for the gigantic Authorized Participants, ETF tracking can and does diverge more significantly than it does during normal periods of time. Tracking will also tend to be more erratic for ETFs that have baskets that are composed of less-liquid securities (this is easy to understand once you realize that the whole key to taking advantage of an arbitrage situation is liquidity to buy something in one place and sell it in the other place in order to take advantage of the temporary gaps in price).

For securities that are not very liquid to begin with, the potential for trouble is exacerbated. The dangers this poses to investors at large should be fairly clear: they buy ETFs thinking that it will track some commodity or some group of securities (at least reasonably well), and for the most part it does – until the market is in an upheaval. Then, in addition to watching the price of everything drop (which usually happens at times of upheaval), investors in these securities might be hit with a “double-whammy,” when the market price of their ETF shares becomes untethered from the thing they thought it was supposed to track.

This could lead to the situation in which investors can only *wish* that they merely lost as much as they would have lost if they had owned the underlying securities or commodities in question (not a very nice thing to have to wish!).

We might categorize this particular possible development as the danger of an “acute” problem: one that could develop very rapidly out of a situation that seemed just fine the day before, and one that everyone would notice (there would be a lot of investors complaining very loudly about the fact that their ETFs decoupled violently downward from whatever it was they were supposed to be tracking, in such a scenario). That would be an “acute” problem, in the same way that a burst appendix is an acute problem.

But, as outlined in the list of potential negatives to ETFs, these pervasive financial instruments may also create a different kind of problem, one that is very different than a burst appendix and more like an unnoticed tapeworm: the possibility that ETFs engender a pervasive, non-acute malaise, as they grow larger and larger and fill up a bigger and bigger portion of the markets in which they live.

Evidence suggests that they reduce the demand for financial analysis, and that they make markets less efficient, and more costly. In an academic paper published in July 2015, entitled *Is There A Dark Side to ETF Investing? An Information Perspective*, by Doron Israeli, Charles M.C. Lee, and Suhas A. Sridharan, the authors present evidence that the massive growth of ETFs leads to these exact systemic problems.⁶

They write:

As ETF ownership grows, an increasing proportion of the outstanding shares for the underlying security becomes “locked up” (held in trust) by the fund sponsor. Although these shares are available for trade as part of a basket transaction at the ETF-level, they are no longer available to traders who wish to transact on firm-specific information. In addition, ETFs offer an attractive investment alternative for uninformed traders who would otherwise trade the underlying component securities. These two effects create a steady siphoning of firm-level liquidity which in turn generates a disincentive for informed traders to expend resources to obtain firm-specific information.

We propose and test two hypotheses. First, we posit that as ETFs become larger holders of a firm’s shares, transaction costs for the underlying securities will increase. This increase in trading costs is associated with a decrease in available liquidity for the component securities owned by ETFs. Second, we posit that these increased transaction costs will lead to a general deterioration in the pricing efficiency of the underlying securities. Specifically, we posit that the increased transaction costs will serve as a deterrent to traders who would otherwise expend resources on information acquisition about that stock. In other words, for firms that are widely-held by ETFs, the incentive for agents to seek out, acquire, and trade on firm-specific information will decrease. Over time, this will result in a general deterioration in the firm’s information environment, and a reduction in the extent to which its stock price is able to quickly reflect firm-specific information. Pages 2-3.

Those are some chilling possibilities – and the paper goes on to present extensive evidence that this is exactly what is going on, and that these impacts are directly attributable to the presence and growth of ETFs. The reader is encouraged to examine the arguments and evidence presented in that paper for himself or herself, and to become involved in this extremely important topic of discussion – because it is a development that may well impact everyone.

The authors show that the expansion of ETF ownership of a firm “is associated with a decline in the number of analysts covering a firm” and that “an increase in ETF ownership is accompanied by a decline in the pricing efficiency of the underlying component securities” (page 4). They also discuss studies which conclude that ETFs can contribute to “more rapid transmission of liquidity shocks, higher return correlation among stocks held by the same ETFs (Da and Shive 2013, Sullivan and Xiong 2012), greater systemic risk (Ramaswamy 2011), and elevated intraday return volatility both for the component stocks and for the entire market (eg Ben-David et al. 2014, Broman 2013, Krause et al. 2013), particularly in times of market stress (Wurgler 2010)” (page 5). And they show that the emergence of ETFs leads to “the siphoning of firm-level liquidity and an increase in trading costs” linked to “a reduction in the incentives for information acquisition, and hence lower pricing efficiency” (page 6).

The authors suggest that these negative effects begin to impact a stock as ETF ownership of its outstanding shares increases – and they define those with “high ETF ownership” as having ETF ownership of just 3% or more of the outstanding shares. There are various free resources on the web which enable investors to see the major holders (based on 13F filings) for various individual stocks: the reader is invited to start looking through some different companies and “adding up” the ETF ownership percentages, to get an idea of just how pervasive the expanding clouds of the fast-growing ETF phenomenon already are. Unfortunately, smaller companies appear to have an even higher likelihood that ETFs own what this study would consider a “high percentage” of their outstanding shares.

This study shows that the potential costs of the massive expansion of ETFs are spread to everyone: to non-ETF investors as well as ETF investors, but in fact even to non-investors as well. If the markets which link companies to capital become clogged with an efficiency-deadening *bloom*, a sort of ETF *algae*, then everyone working at those companies (or using their products) could be said to be potentially impacted.

What are some of the ways for investors to best address this frightening problem? We’re not sure at this point of all the answers to that question, but we believe it begins with becoming more informed about the situation and asking tough questions.

We would also propose that investors consider whether or not they really want to base their financial future on an investment vehicle that has so many potential hazards – both acute hazards and more systemic hazards.

Ultimately, we believe that investors should know about what they own, and that as much as it is possible to do so they should seek to invest directly in businesses rather than through synthetic, financially-engineered instruments.

The further investors are removed from that process, the more they seem to become complacent about doing the real due diligence on the companies that are issuing the securities in which they are investing, which we believe is part of the reason that the ETF phenomenon has grown so large, so fast, and with very little critical scrutiny by the general investing community.

There have been academic voices which are raising some concerns, and we commend the authors of the study which asks whether there may be “a dark side to ETF investing.” We hope that there will be more examination of this issue, before the problem becomes even bigger than it already appears to be.

Notes:

1. Investment Company Factbook, 2003. https://www.ici.org/pdf/2003_factbook.pdf (105).
2. Investment Company Factbook, 2015. https://www.ici.org/pdf/2015_factbook.pdf (185).
3. *Wall Street Journal* How-to Guides: “[How to Choose an Exchange-Traded Fund](#)” Accessed 08/26/2015.
4. “[When, If Ever, Will Actively Managed ETFs Take Off?](#)” Cinthia Murphy, Accessed 08/26/2015.
5. Website of www.etf.com: “[What is the creation/redemption mechanism?](#)” Accessed 08/20/2015.
6. [Is There A Dark Side to ETF Investing? An Information Perspective](#). Doron Israeli, Charles M.C. Lee, and Suhas A. Sridharan, 07/26/2015.



TAYLOR FRIGON
CAPITAL MANAGEMENT LLC

HEADQUARTERS

656 Santa Rosa Street,
Suite 3B San Luis Obispo,
CA 93401 Ph 805-226-0280

SAN FRANCISCO

One Market Street,
Spear Tower, 35th Floor,
San Francisco, CA, 94105

SANTA BARBARA

1114 State Street, Suite 250
Santa Barbara, CA 93101
805-226-0280

info@taylorfrigon.com

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