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Rational Investing in Today's Irrational Stock Markets

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These days, many newspapers, market pundits and even some credible journalists and investors write about the death of value investing. This is understandable. Many of its adherents are currently underperforming the market. Digitization is changing all aspects of business. And the world is facing a historic economic and health crisis in an environment of low interest rates and high debt levels. Why should an investment style that worked well in the past also work in this new and fundamentally different environment? In this essay, I discuss the concept of rationality applied to investing and try to convince the reader that for the active investor, value investing is the only rational (i.e. sensible) way to invest.

"Rationality describes reason-based thinking and acting. It is aligned with purposes and goals. Reasons that are considered reasonable are chosen on purpose." This is how Wikipedia describes rationality. Rational investing therefore means investing reasonably to achieve reasonable returns. Is there a better reason to invest than to get more value than you give? No. Therefore, there is no difference between reason-based and value-based investing. (This essay focuses on active investing. For a discussion of passive investing, see John Bogle's *Common Sense on Mutual Funds*.)

A value investor calculates the intrinsic value of a company and only invests where this value significantly exceeds the company's market price. This difference between price and value – also known as the margin of safety – protects an investor from unforeseen events and enables him or her to achieve excess returns where no such events occur. All else being equal, the more mispriced opportunities an investor can find, and the higher their mispricing, the better. A rational investor builds a portfolio of the best opportunities he can find, using his multidisciplinary knowledge and the tools of rationality (i.a. logical thinking, probability theory, Bayesian reasoning, statistical decision theory, correlation, causation, rational choice theory, game theory) while trying to avoid the many pitfalls (i.a. entropy, emotions, ideology, heuristics, biases, cognitive illusions) that make achieving reasonable results so difficult.

Like humans, the stock market values many different things in different ways and is prone to significant mood swings. But there is one objective measure of value that never lost its relevance: cash (i.e. currency that lies on and/or flows into a company's balance sheet). Of course, not every activity that generates cash is creating value (i.a. rent-seeking, negative externalities). And markets often don't adequately value important activities (i.a. positive externalities, household work). But undoubtedly, what counts for investors is what is valued by the stock market. And here, the verdict is clear: The stock market values cash. This is both a theoretically and empirically well-established fact.

In the words of the Nobel Prize Committee: "Basic theory says that a stock's value should equal the expected value of future dividends… Shiller and his collaborators demonstrated such predictability in stock markets as well as bond markets, and other researchers have later confirmed this finding in many other markets…" (The Prize in Economic Sciences 2013)

And even Robert Shiller, who falsified the strong form of the efficient market hypothesis and received the Nobel Prize for this work, confirms that the market for individual stocks is quite efficient: "Samuelson has offered the dictum that the stock market is 'micro' efficient but 'macro inefficient'.

That is, the efficient markets hypothesis works much better for individual stocks than it does for the aggregate stock market. In this article, we review a strand of evidence in recent literature that supports Samuelson's dictum and present one simple test, based on a regression and a simple scatter diagram, that vividly illustrates the truth in Samuelson's dictum for the U.S. stock market data since 1926." (Jung, Shiller, March 26, 2007)

For value investors, this is vital, as they depend on the stock market to value their rational theses on individual stocks accurately and within a reasonable time frame. Furthermore, while this relationship between price and value holds over long-time periods for most stocks, it does not hold for every stock all the time and, for some stocks, it may even never hold. The stock market therefore works similar to what I call Lincoln's Dictum: "You may fool people for a time; you can fool a part of the people all the time; but you can't fool all the people all the time." (Abraham Lincoln)

The only rational (i.e. reasonable) way to calculate the intrinsic value of a company is the present value method. Present value is a term from financial mathematics. It is the value that future payments have in the present and is determined by discounting the future payments and then adding them up. The present value takes into account that payments in the future are worth less than those in the present and that the future and the present are linked with each other via a chain of probabilities.

The mathematical calculations are easy and straightforward. For a constant annuity (i.e. perpetual cash flows), the income stream of the first year is divided by the discount rate to calculate the present value. If the annuity grows, the growth rate is subtracted from the discount rate, increasing the present value. The discount rate corresponds to the expected market return and is composed of a risk-free interest rate (usually the return on ten-year government bonds) and a risk premium (historically around 3% to 6% per year). The latter can be empirically observed and rationally justified. Stocks are usually riskier than government bonds because governments can print their own money and therefore will always be able to service their debts (however, this is not true for all governments). Therefore, stocks usually trade at a discount (i.e. yield a premium) compared to government bonds (note that the price discount and risk premium are inversely related: the lower the price, the higher the yield).

A company that makes a profit of CHF 10 million every year has a present (i.e. intrinsic) value of CHF 200 million when applying a discount rate of 5% (= 10/0.05), which corresponds to an earnings multiple of 20 (= 1/0.05). If the company's profits grow by 2% per year – and this growth can be achieved without investing additional capital – the present value of the company grows to CHF 333 million (= (10/(0.05-0.02)) or = 10/0.03), corresponding to a multiple of 33 (= 1/0.03). As we have seen above, the stock market is a rational valuation machine over the medium to long term, allowing the investor to assume that, once he or she has found a mispriced opportunity, the market will sooner or later reflect its rational value. Assuming that the above company is currently trading on the stock market for a price of CHF 150 million, the safety margin is 25% (= 1- (150/200)), the cash return on the investment 6.7% (= 10/150), and the share price will probably increase from CHF 150 to 200 million (i.e. until the return on an investment in the company approaches the market rate of return). The total return for a long-term investor therefore amounts to 5% per year (= 10/200) plus a one-time increase in value of 33% (= (200/150)-1).

A present value calculation is useless if an investor does not have a good understanding of a company's business model, its competitive position, the integrity and shareholder orientation of its management and many other factors that influence future cash flows. Most companies can increase their profits only by investing more capital. And there is often a discrepancy between a company's cash earnings and its accounting profits. What matters is the cash that a company earns during its remaining life, and if that cash is (mis?)appropriated by the company's management, its competitors, or any other stakeholder, the value for an investor correspondingly declines. An investor always gets the residual value (i.e. the leftovers) of a company's revenues, and the analysis of the factors that

influence this residual value is often qualitative in nature. “Not everything that counts can be counted, and not everything that can be counted counts.” (William Bruce Cameron)

However, the quantitative corset of the present value calculation is indispensable because it ensures that an investor’s expectations are grounded in reality and that the investment is rationally justifiable. A company that earns too little money in relation to the price paid cannot be a good (i.e. rational) investment. Instead of benefiting from an increase in corporate profits that are reasonably valued, speculators profit from a higher willingness to pay of the other market participants.

Investing and speculation therefore are two fundamentally different activities. An investment is a nonzero-sum game that can be worthwhile for everyone involved: the seller gets a fair price, the buyer buys a fair return and society gets a fair transaction. Speculation, on the other hand, is a zero-sum game (i.e. a negative-sum game after deducting transaction costs). The profit of a speculator comes at the expense of other market participants (except, of course, market makers), reducing overall wealth, which is why speculation must be considered a rent-seeking rather than a productive (value-adding) activity.

Furthermore, speculation cannot be a rational activity as it depends on the irrationality of at least one of the involved parties. A disciplined application of the present value method takes this simple and profound – but too often ignored – truth into account. This does not mean that rational (i.e. value) investors do not profit from irrationality. Quite to the contrary, the greater the mispricing in a given situation, the greater the profit opportunity. And every nonzero-sum transaction has a zero-sum dimension to it. But in a value investment – contrary to a speculation – return expectations are based on an assessment of the underlying profit structure and do not depend on the irrationality of other market participants. Not all stock purchases are created equal.

As shown above, efficiency is needed for rational analyzes to be reflected accurately by the stock market. Inefficiency is needed for investment opportunities to be found in the first place. Theoretical and empirical evidence shows that both conditions are satisfied in the real world: “While asset prices often seem to reflect fundamental values quite well, history provides striking examples to the contrary…” (The Prize in Economic Sciences 2013)

How can these two — seemingly contradictory — facts both be true at the same time; how can we square this circle? The answer is surprisingly simple. Like all unregulated prices, stock prices are determined by the interplay of supply and demand. Therefore, small changes in the traded volumes of stocks can have a dramatic impact on their prices. This is illustrated impressively by the oil market. While oil production and consumption have risen continuously over many decades, the price of oil fluctuated dramatically during this time period. “When the price of a stock can be influenced by a ‘herd’ on Wall Street with prices set at the margin by the most emotional person, or the greediest person, or the most depressed person, it is hard to argue that the market always prices rationally. In fact, market prices are frequently nonsensical.” (Warren Buffett in *The Superinvestors of Graham-and-Doddsville*, 1984)

The father of value investing, Benjamin Graham, aptly wrote in 1934: “It will be evident from the chart that the influence of what we call analytical factors over the market price is both partial and indirect … In other words, the market is not a weighing machine, on which the value of each issue is recorded by an exact and impersonal mechanism, in accordance with its specific qualities. Rather, we should say that the market is a voting machine, whereon countless individuals register choices which are the product partly of reason and partly of emotion… Hence the prices of common stocks are not carefully thought out computations, but the resultants of a welter of human reactions. The stock market is a voting machine rather than a weighing machine. It responds to factual data not directly, but only as they affect the decisions of buyers and sellers.” (*Security Analysis*)

Nonetheless, Graham himself noted that the stock market is a rational valuation machine in the medium to long term: “In the short-run, the market is a voting machine – reflecting a voter-registration test that requires only money, not intelligence or emotional stability – but in the long-run, the market is a weighing machine.” (Berkshire Hathaway Shareholder Letter 1993)

Besides Graham and Buffett, there are many other successful investors who have skillfully exploited these market characteristics for many decades. And in addition to these empirical observations, theoretical arguments further support the validity of the efficient market hypothesis while acknowledging its limitations. In 2013, Robert Shiller and Eugen Fama both received the Nobel Prize in economics for their research on the efficient market hypothesis; quite astonishingly, as their opinions on this hypothesis are diametrically opposed to each other. “There is no way to predict whether the price of stocks and bonds will go up or down over the next few days or weeks. But it is quite possible to foresee the broad course of the prices of these assets over longer time periods… These findings, which may seem both surprising and contradictory, were made and analyzed by this year’s Laureates, Eugene Fama, Lars Peter Hansen and Robert Shiller.” (The Prize in Economic Sciences 2013).

As the universal genius and Harvard professor Steven Pinker neatly sums up: “As irrational as humans may sound, there is reason to believe that – since expected utility theory really does capture what it means to be consistently rational in the long-term – when you have people put skin in the game and have lots of experience, namely in a market, they do tend to approach rational decision theory. Indeed, economists debate the extent to which this is true – this is sometimes called the efficient market hypothesis. If people, especially those that are actively engaged in some markets, really did deviate from expected utility theory…, then you should be able to get really rich by exploiting the deviations between the typical psychology of a trader and the optimal model from expected utility theory and become filthy rich. In general it is not so easy to outguess the market and there is reason to believe that if the market is not perfectly efficient, it is efficient enough that a lot of people are adjusting their own psychology to the principals of expected utility theory.” (Harvard Lecture 8 on Rationality, GENED 1066)

In other words, even if the market is not perfectly efficient, it is at least efficient enough that it makes sense for most people to pretend that it is perfectly efficient. However, some people (including many value investors) know how to skillfully exploit the remaining inefficiencies in markets while acknowledging that it is quite difficult to do so.

“All well and good. But today, this is no longer valid. Today, markets are different. What used to work in the past doesn’t work anymore.” This statement must be taken seriously. Many value investors who have been very successful in the past (including Warren Buffett) have not beaten the market in the last ten years. What used to work in the past may no longer work today, especially if the environment has changed. Today’s world is characterized by historically high debt levels and permanently low interest rates. We are experiencing an economic and health crisis triggered by a new virus and digitization is changing almost all areas of life and business. However, these facts don’t reduce the success potential of a value investing strategy.

On the contrary, when the world loses its sanity, it is even more important that an investor holds on to it. A few years of relative underperformance are not uncommon for value investors that ultimately beat the market (a fact highlighted among others by famous value investor Joel Greenblatt). And we have every reason to believe that cash flows will sooner or later be valued rationally by the market. “To use the economists’ terms: In substantial part, prices are determined by endogenous effects peculiar to the inner workings of the markets themselves, rather than solely by the exogenous action of outside events. Moreover, this internal market mechanism is remarkably durable. Wars start, peace returns, economies expand, firms fail – all these come and go, affecting prices. The fundamental process by

which prices react to news does not change. A mathematician would say market processes are stationary." (*The Misbehavior of Markets*, 2004)

Therefore, what matters to investors is that the companies in which they invest in perform operationally (i.e. in terms of cash profitability) as they expect them to and that they can trust markets to reflect operational performance accurately over time. Even Fama and Shiller – who couldn't agree on many things – seem to agree on this: "In his hour-long interview with the official broadcaster for the Nobel prize ceremony, Shiller questioned how much the two really differ and suggests Fama does actually share his 'value investing' approach – a consistent policy of buying assets that are low priced and being patient. Where they differ, Shiller says, is on how rational investors are and on how well they can foretell market moves." (*The Guardian*, December 10, 2013)

I hope that by now I have convinced the reader that for the active investor, value investing is the only rational (i.e. sensible) way to invest.

To end this essay, I apply these insights to a hypothetical investment in a company on the Swiss stock market, LafargeHolcim. During the past 12 months (up to June 30, 2020), LafargeHolcim generated an operating cash flow of CHF 5 billion. After subtracting CHF 1.3 billion of capital expenditures, it achieved a free cash flow of CHF 3.8 billion. The company currently trades at a market cap of around CHF 27 billion (excluding minority interests), which equates to a free cash flow multiple of 7 times (=27/3.8). Free cash flows usually underestimate a company's true profits, as they deduct all capital expenditures from operating cash flow, while accounting profits only take into account depreciation (excluding growth investments). Therefore, where depreciation is a more accurate reflection of status-quo investments than capital expenditures, free cash flow underestimates owner earnings (see *The Essays of Warren Buffett* for a more detailed discussion on this topic).

The interest rate on ten-year Swiss government bonds currently is around -0.5%. Including a risk premium of 3.5% (a subjective estimate), the discount rate (i.e. the expected market rate of return) is currently around 3% (= -0.5%+3.5%), which corresponds to a valuation multiple of 33.3 (= 10/0.3). Therefore, there currently exists a very large discrepancy between the cash return on an investment in LafargeHolcim of around 14% (= 3.8/27) and the expected Swiss market rate of return of around 3%. This discrepancy probably won't last forever. Consequently,

1) either the free cash flow of LafargeHolcim will collapse, decreasing the free cash flow yield to a level that corresponds more closely to the market rate of return, and/or

2) conversely, the market rate of return will increase to the level of the company's free cash flow yield, and/or

3) the stock price of LafargeHolcim will increase until the free cash flow yield corresponds more closely to the market yield.

The reader will have to rely on his or her own analysis to judge which of these three scenarios is most likely.

In today's world, no essay would be complete without a few words on tech companies. Most of them can grow their cash flows without much capital investment, making them very valuable. Recall the annuity equation, in which the growth rate is subtracted from the discount rate in the denominator, significantly increasing the present value of the future earnings stream. However, in this world, there are always limits to growth, and no company can grow forever faster than the economy as a whole (otherwise the economy would pretty soon consist of only this one company). Mathematically speaking, the discount rate has to be higher than the growth rate; the denominator cannot be

negative, as divisions by negative numbers are meaningless in this case.

Facebook, for example, was able to grow its operating cash flow from CHF 10.3 billion in 2015 to 35 billion in 2019, a compound annual growth rate (CAGR) of 37%. Free cash flow grew a little more slowly from CHF 7.8 billion to 20.5 billion at a CAGR of 27%. Sooner or later, this growth rate will have to come down.

We know from valuable research on prediction by Philip Tetlock that even the best "superforecasters" can only predict a few years out, with the accuracy of their predictions declining "with distance into the future" and falling "to the level of chance around five years out." (Steven Pinker in *Enlightenment Now*, 2018)

Let's assume that a rational value investor is convinced that Facebook will be able to grow its free cash flow at a CAGR of 25% for the next five years, yielding a free cash flow of CHF 63 billion in 2024 (note that as discussed above, free cash flows may substantially underestimate a company's true owner earnings). Applying a multiple of 20 (or better 33?) to those numbers yields an intrinsic value of CHF 1.3 trillion in 2024, while Facebook's market cap today is around CHF 840 billion.

This calculation shows that today's tech companies, despite their seemingly high valuations, might actually be a value bargain when analyzed rationally. However, and this is crucial, an investor must feel comfortable with his assessment that Facebook can sustain the high growth rates going forward. "Things that can't go on forever don't" (Stein's Law). Changing the growth rate from 25% to a still high 10% reduces the intrinsic value of the company in 2024 to CHF 660 billion, 22% below today's market capitalization.