# Equity Multiples: Myths, Mania and Alchemy

***A valuation riddle … wrapped in a mean reversion mystery … inside an accounting enigma.***

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*"If I have seen further it is by standing upon the shoulders of Giants",*

*Isaac Newton, 1675*

## Abstract

*The paper is a practitioner validation of the well-known yet conveniently ignored reality that equity Multiples such as the popular Price Earnings Ratio have essentially no theoretical foundations as economic value metrics; they are effectively a matter of market convention and convenience. Multiples are preferred over gold standards of valuations such as the Discounted Cash Flow (DCF) methodology on the ground that the former is easy to calculate while the latter requires a substantial amount of explicit assumptions such as profit margins, discount rate, and growth rate, thus making the results of the discounting exercise unreliable. The paradox is that the same input and assumptions used in the DCF are required for the variables used to calculate the Multiples. The difference is that these variables are explicitly quantified in the DCF while they are implicit in the Multiples, i.e. decided by someone else and "concealed" in one number. The paper exposes this point analytically by equating Multiples to universally accepted valuation principles, thereby establishing a clear link and dependence of Multiples to fundamental drivers of economic value. Using descriptive arguments, the paper then debunks the "secular" bedrocks for Multiples application, such as the practice of assessing "value" by comparing Multiples across arbitrary benchmarks - e.g. history, comparable, markets, countries, etc. - and then relying on mean-reversion strategies to "arbitrage" discrepancies. Lastly, the paper echoes the admonition of confusing accounting Earnings with Economic Earnings, thus providing support to those quipping that "Cash(flow) is a fact, Earnings is an opinion". Ultimately, the intended contribution of this paper is to catalogue these arguments all into one place, and for the practitioner's consumption. The conclusion and the advice are that Multiples, given their widespread and obstinate popular use, should be considered at best as momentum and sentiment indicators, worshiped by speculators and shunned by fundamental investors.*[2]

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## 1. Introduction

There is an inconvenient truth in the alchemist world of investment: multiples such as the popular Price Earnings Ratio or Price to Book Value are not value metrics, far from it! Multiples are a market convention, based on accounting suggestions and interpretation, not supported by any rigorous finance theory. As such, multiples are at best a momentum indicators and testers of market sentiments. While their simplicity makes them convenient as a reference in special cases of relative valuation practices (e.g. initial public offering), their explicit link (or lack thereof) to a firm's fundamentals -- i.e. profitability, risk, use of capital, growth, time -- is often conceptually overlooked and practically ignored. Indeed, relying only on these measures as "shortcut" indicators of fundamental value can lead to erroneous investment deductions, unpleasant outcomes, and outright financial harms.

According to financial historians[3], multiples based on Earnings trace their origin back to the beginning of the 20th century in America. Prior to that, and possibly from the beginning of (financial) time, the main metrics relied upon by investors for assessing the value of a stock was the dividend yield. There are several reasons for that. To start with, stocks were traditionally a small portion of "capital markets", with the larger component consisting primarily of debts, bonded or otherwise – reportedly there was typically a 3 to 1 ratio in favor of bonds in major capital markets such as the United Kingdom. Thus, equities had to "compete" with debt on the same metric, i.e. yield. In addition, there was little if any public information and details on the financials of a stock issuer other than dividend policies and some assets estimates to gauge the capacity to pay the dividend. The situation changed during the Roaring Twenties in the United States. With booming economic conditions fueling expectation of stratospheric profit growth, Earnings and Earnings growth became the main market obsession with dividend yields no longer sufficient to guestimate the speculative price of a stock. Thus, and in order to compare and rank alternative investment opportunities, the convention then became to "normalize" Earnings by relating them to the market price of the stock, i.e. dividing the price of the stock by its Earnings or the Price to Earnings ratio.

Now, it is well known how the Roaring Twenties ended up … and the then misguided assessment on stock valuations. Despite the market debacle however, the use of multiples as a value metric caught on. In fact, the market convention of relating the price of a stock to accounting measures only increased in popularity as more granular, standardized accounting details started to be published, thus permitting more granular financial analysis. Multiples then slowly but surely became the norm globally, albeit it took a while before other main markets adopted them – according to Soman (*Op. Cit.)*, the "multiple convention" was broadly adopted in the United Kingdom only in the mid-60s!

[3] Soman, Nilesh. "Retracing the History of Price to Earnings Ratio." *Money Control*, 11 Feb. 2014, https://www.moneycontrol.com/news/business/personal-finance/retracinghistoryprice-to-earnings-ratio--1185979.html.



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Nonetheless and since then, there has been a plethora of academics, practitioners, and other warnings on the lack of rigorous theory at the base of these pseudo value metrics. Most if not all warnings continued to stress a simple fact: multiples are just a volatile price (i.e. a momentum indicator) divided by an accounting variable (i.e. a suggestion, not a fact)!

There are in fact plenty of eminent warnings on the futility and outright danger of relying on multiples to formulate and act on investment strategies. In the 2000 Berkshire Hathaway Annual Report[4], Warren Buffett the "Sage of Omaha", or the most well-known, highly successful and revered investor stated: "*Common yardsticks such as dividend yield, the ratio of Price to Earnings or to book value, and even growth rates* ***have nothing to do with valuation*** *except to the extent they provide clues to the amount and timing of cash flows into and from the business*". [5] Despite using multiples in his "lingo", Mr. Buffett is well-known to reiterate that multiples have no real use without (much, a lot of) additional information. As put humorously by another market sage, using multiples to assess value is like estimating one's weight by looking at one's shadow … possible if one has the perfect angle of the sun, the height, the BMI, etc., etc.

Yet, multiples remain by far the most popular value metrics in stock market parlance amongst analysts, academics, institutional and retail investors. According to a survey published in an MIT Sloan Working Paper in 2004[6] and based on a database constructed from analyst reports issued by *Institutional Investors All-American Team Members* during 1997 to 1999, almost 100 (99.1) percent of analysts surveyed rely on Earnings multiples to communicate their findings. The even more telling point of the study is that less than 15 percent "also" (i.e. in addition to multiples) used some form of Discounted Cash Flow methodology. The "buy side" (i.e. portfolio managers) is no different with hundreds of billions of dollars managed in "value" and "growth" funds and ETFs where multiples "play" a major (the primary?) role in the stock selection process!

The most common argument put forward by the diehard consumers of multiples is that the Discounted Cash Flow (DCF) valuation methodology alternative, despite being recognized as the gold standard, is just too complex and cumbersome to use in the fast-moving world of investment (or fast world of speculation!). More precisely, they argue that the DCF requires so many explicit

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[4] *Berkshire Hathaway Inc. Annual Report,* 2000, p.14. He famously went on to say "*Indeed, growth can destroy value if it requires cash inputs in the early years of a project or enterprise that exceed the discounted value of the cash that those assets will generate in later years****. Market commentators and investment managers who glibly refer to "growth" and "value" styles as contrasting approaches to investment are displaying their ignorance, not their sophistication. Growth is simply a component -- usually a plus, sometimes a minus -- in the value equation***"

[5] During an annual meeting of investors, Charlie Munger of Berkshire Hathaway, or the "Richelieu of Omaha" was very explicit in describing Berkshire's valuation methodology (reproduced in a short YouTube video https://www.youtube.com/watch?v=5ioeNrmn4eY and concluded that, despite being widely quoted and revered "*… that practice of ours which is so simple is not widely copied … it is not the standard in the investment management, even at great universities and other intellectual institutions*". Mr. Munger went on to say "… ***if we are so right, why are so many eminent places so wrong".)***

[6] Asquith, P., Mikhail, M.B., and Au, A.S. "Information Content of Equity Analyst Reports", *MIT Sloan Working Paper 4264-02**, 2004, Table 1: Panel A, p. 34. Re-printed in the *Journal of Financial Economics*, vol.75, no. 2, Feb. 2005, pp. 245-282.



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assumptions such as return on investment, cost of capital and risk, time, growth, etc. that the discounting exercise is bound to make the results at best vague if not outright useless. Multiples are (obviously) a lot easier to calculate and "understand", the argument goes. **The paradox is that, and here is where the truth becomes inconvenient**, **the same explicit assumptions needed to run a DCF are the same exact drivers imbedded in and determinant of the multiples**; **the difference is that these drivers are explicitly quantified in the DCF while they are implicit (buried) in the multiples, i.e. they are "concealed" and estimated by someone else!** For the herd majority, this complete lack of transparency on the fundamental drivers of value does not appear to be a problem. For fundamental investors focused instead on assessing underlying drivers of value, multiples are utterly useless, if not outright deceiving.

The difference in attitude and popular market practice may be explained by the (legitimate) difference in scope between a speculator and an investor. The speculator is interested in buying an asset or a stock in order to turn around and resell it to someone else at a higher price, or the "*buy low, sell high*" approach. To that end, multiples may have some value as momentum and market sentiment indicators; intrinsic value rarely enters this equation, though. The investor on the other end buys an asset or a stock to keep it for its "earning" power or for the expectation to generate periodical value (i.e. cash flow) over a specified period. Hence the investor will need to gauge explicitly the value for the drivers imbedded in the market. That is, multiples will be next to useless for all those fundamental investors who, rather than forecasting the future, more often than not an expensive exercise in overconfidence, prefer dissecting the present, i.e. assessing, and weighting the individual value drivers implied in the market price.

The following sections will elaborate further on the tug of war between the two alternative valuation practices, i.e. convention for speculators and analytics for investors. Section 2 will analytically establish the link between multiples and fundamental drivers of value -- e.g. profit margins, cost of capital, risk, growth, etc. -- by equating multiples to universally accepted intrinsic valuation methodologies. To be sure, the methodologies used in Section 2 are nothing original and rely primarily on well-established principles of finance. The objective however is to apply these principles in order to display analytically the flaws of using these pseudo value metrics in a vacuum … i.e. reiterating the danger of succumbing to crowd illusion.

Section 3 will apply a descriptive approach (the only possible) to debunk the more popular and conventional "secular" underpinnings of multiples, i.e. the relative valuation approach, reversion to the mean, and the accounting foundations. Throughout the paper, we will develop our arguments referring primarily to the Price Earnings Ratio, the most popular multiple commonly used as a value metric. The same analysis and conclusions however can easily be extended to other popular multiples used as value metrics, e.g. Price to Book[7], using simple equity algebra.

[7] Note that Price to Earnings * Return on Equity = Price to Book



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## 2. Multiples: The Theory … *or lack thereof*

Multiples have essentially no theoretical underpinning as value metric as they are for all intents and purposes a matter of market convention and convenience. Thus, it is challenging to debunk their "merit" and value content by applying a rigorous academic approach, i.e. based on formal quantitative and deterministic methodologies and theories. Multiples draw their legitimacy from a set of accounting principles combined with the simplistic belief that markets are mean reverting, a loosely-defined relative value concept whereby discrepancies from an arbitrarily determined reference point (the mean) can be arbitraged away. At best, it can be argued that this "market convention" is championed only by accounting principles, thus leaving the quantitative determination of multiples a matter of subjective interpretation of financial statements – Income Statement, Balance Sheet and Cash Flow statements –, statements that are in turn legitimized and "constrained" within the guardrails of Generally Accepted Accounting Principles. And here is where the utility of multiples as economic value metrics fails … miserably!

Nonetheless, and applying the proverbial benefit of the doubt, one rational analytical approach exploited below to assess the possible "merit" of multiples as an economic value metric is to equate them to universally accepted principles of financial valuation. The objective is to explicitly determine links between multiples and fundamental drivers of value, and at the same time highlighting the danger of blindly applying these value metrics in a vacuum, i.e., without complementary information on fundamentals.

### 2.1 "*The cynic knows the price* [earning] *of everything and the value of nothing* ", Oscar Wilde.

Despite all the cacophony and the zoo of value metrics and methodologies, the gold standard of valuation is and remains beautifully simple. Conceptually, practically, logically, and otherwise the monetary value of any investment is the sum of the future cash flow discounted back to present value. The discount rate used in the calculation -- a.k.a. cost of capital, a.k.a. cost of equity -- is by construction equal to the compounded return expected from the investment measured in percentage. This truism is set in stone and few if any analysts worth their salt would even dare questioning this universally accepted basic finance principle. The debate has been primarily centered on the different, albeit crucial definitions of cash flow (e.g. Earnings, Dividend, Free Cash Flow to the Firm, etc.) and the estimation of the discount rate.

Franco Modigliani and Merton Miller (M&M), in a series of papers considered to form the foundation of Modern Corporate Finance Theory[8], postulated that: the market value of a firm will be equal to the net cash flow to shareholders generated from existing assets plus the net

[8]Modigliani, F. and Miller, M. "The Cost of Capital, Corporation Finance and the Theory of Investment". *American Economic Review*, vol. 48, no. 3, Jun. 1958, pp. 261–297. JSTOR 1809766.
Modigliani, F. and Miller, M. "Corporate Income Taxes and the Cost of Capital: A Correction". *American Economic Review*, vol. 53, no. 3, Jun. 1963, pp. 433–443. JSTOR 1809167.



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present value of cash flow generated by future investments, and is independent from the capital structure of the company. In the process, M&M demonstrate that, if properly defined, all main cash flow formats – Dividends, Earnings (net of investment necessary to generate them), Current Earnings plus Future Investments, Free Cash Flow to the Firm – will all generate the same results[9]. Hence, no matter the capital structure and the cash flow considered (e.g. dividend, Earnings plus, Free Cash Flow, etc.) the net present value methodology calculation can be considered the *Rosetta Stone* of valuation methodologies. Hence, it is abundantly rational to use this gold standard of valuation as a reference point for value, and then formally equate it to multiples to highlight the drivers and value content.

### 2.2 Valuation 101

The most celebrated valuation formula applicable to any investment is the Discounted Cash Flow methodology. The formula is beautifully simple and is derived from the future value equation for calculating the time value of money. For a series of periodical payments until period n, the value of the investment will be equal to:

$$V = \frac{CF_1}{(1+k)^1} + \frac{CF_2}{(1+k)^2} + \frac{CF_3}{(1+k)^3} + \cdots + \frac{CF_n}{(1+k)^n}$$

where:

*V* = the monetary value of the investment measured in currency unit (e.g. $)

*CF* = cash flow from period 1 to n measured in currency

*k* = The discount rate, a.k.a. expected return of the investment, a.k.a. cost of capital.

n = number of periodical cash flows, from 1 to n.

The simplest and most revealing application of this valuation methodology is the (universally accepted) determination of the price of a bond, i.e. a financial instrument that pays a fixed cash flow periodically and a principal amount at maturity. Again, no serious financial analyst would even dare questioning this widely accepted identity:

$$P = \frac{Coupon_1}{(1+YTM)^1} + \frac{Coupon_2}{(1+YTM)^2} + \frac{Coupon_3}{(1+YTM)^3} + \cdots + \frac{Coupon_n + Principal}{(1+YTM)^n}$$

[9] Modigliani, F. and Miller, M. "Dividend Policy, Growth, and the Valuation of Shares", *Journal of Business*, vol. 34, no.4, Oct. 1961, pp. 411-433.



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*P* = the price of the bond in currency (e.g. $)

$Coupon$ = The fixed dollar amount paid in each period from 1 to n.

*YTM* = the yield to maturity that the bond will generate at a price P, i.e. the expected return

*Principal* = the fixed face value of the bond paid at maturity n.

n = maturity of the bond, e.g. 10 years.

The convenience here is that a bond typically pays a fixed amount (ergo the "fixed income" label). Extending this methodology to any other investment where the cash flow is not predetermined obviously creates some challenges. If the investment does not have a fixed payment for a fixed number of periods, then the calculation moves from the realm of certainty (the fixed coupon) to a more difficult exercise of forecasting the future. Applying this methodology to the world of equities where the payments in the future are uncertain (if not random) and are dependent on varying drivers such as growth, interest rates, profits, etc. makes the application of DCF to the valuation of equities challenging, requiring several estimates … *and often pushing practitioners to look for alternatives and shortcuts such as the deceptive multiples*. As mentioned earlier, it is precisely this need for more challenging "homework" and "binding" assumptions that is often cited as the principal drawback of the DCF methodology, despite its unquestionable conceptual superiority.

### 2.3 The Dividend Discount Model

Finance academics came to the rescue with the Dividend Discount Model (DDM) suggesting that part of the cash flow, i.e. the dividend, may be assumed to be (relatively) stable, "quasi fixed?" The model initially posits that the intrinsic value of the stock is equal to the present value of dividends paid until infinity:

$$(1) \quad Intrinsic\ Value_{DDM} = \sum_{t=1}^{t=\infty} \frac{DPS_t}{(1+k)^t}$$

Where:

$DPS_t =$ the dividend at time t

$k =$ expected rate of return, a.k.a. cost of equity.

Next, and to make the cash flow further closer to "fixed", the model assumes that the dividend will grow at a constant rate, the Constant Growth Model, a.k.a. the Gordon Growth Model. The assumption is realistic when applied to firms that have reached a "steady state" or a state where



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the underlying drivers of the business, i.e. profit, growth rates, and discount rate will not fluctuate much. The perfect example would be a utility company where profitability is normally highly regulated, and the growth follows the growth of the economy. Accordingly, the present value of a perpetual stream of payment growing at a constant rate g, will be equal to[10]:

$$(2) \quad V_{Steady\ State} = \frac{E(D_1)}{k - g}$$

Where:

$E(D_1) =$ Expected Dividend for next period

$k$ = Expected Return, a.k.a. cost of capital

$g$ = Constant growth rate

Typically, the growth rate for the steady state is assumed to be the same as the economy[11]. This assumption however can be further refined to zoom on to the key fundamental drivers of value, and then relate these to the market price and multiples. From basic equity algebra, the Dividend for period 1 will be equal to:

$$E\ (D_1) = \ Earnings_0\ x\ (Payout\ Ratio)\ x\ (1 + \ g)$$

Thus, equation (1) above can be rewritten as:

$$(3) \quad V_{Steady\ State} = \frac{[Earnings_0\ x\ (Payout\ Ratio)\ x\ (1 + g)]}{k - g}$$

Assuming market efficiency, equation (3) can now be used to explicitly relate market price to the fundamental drivers of value:

[10] For the mathematical derivation of this equation, see Bodie, Zvi, Kane, Alex, and Marcus, Alan J. *Investments*. Irwing, 1989, p. 475.

[11] Typical assumption is: over the long term a firm cannot grow at a rate higher than the economy, otherwise, the firm eventually becomes the economy. By contrast, the firm can grow at a rate lower than the economy; it will just fade over time and disappear as a financial/economic concern.



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$$(4)\ P_{market} = \frac{[Earnings\ x\ (Payout\ Ratio)\ x\ (1+g)]}{k-g}$$

This market value equation can finally be expressed as a Price Earnings Ratio by simply dividing each side by the Earnings at time 0:

$$(5) \quad \frac{P_{market}}{Earnings_0} = \frac{\boldsymbol{P}}{\boldsymbol{E}} = \frac{[(Payout\ Ratio)x\ (1+g)]}{k-g}$$

If the P/E in turn is stated as a forward P/E, i.e. in terms of next year Earnings, then equation (5) can be further simplified as:

$$(6)\ \ Forward\frac{P}{E} = \frac{Payout\ Ratio}{k-g} = \frac{1-retention\ rate}{k-g}$$

Despite its apparently restrictive assumptions (constant growth, steady state, etc.,) equation (6) has several revealing considerations and applications that warrant close attention. To start with, it is the first "revealing" outcome of this paper as it clearly outlines how the P/E ratio can explicitly be linked (is dependent) with fundamentals, i.e. determined by those same fundamentals explicitly needed in a DCF … and which are apparently dreaded by the diehard users of multiples. Equation (6) unmistakably shows how the P/E ratio is an increasing function of the payout ratio and the growth rate and a decreasing function of the discount rate *k.* **Thus, using the P/E as a value metric conceptually means accepting unambiguously the fundamental assumptions of payout ratio, growth and discount rate concealed in the ratio … i.e., accepting unspecified fundamental assumptions determined by someone else!**

One corollary of the above findings is that equation (6) seems to violate part of the M&M findings and their widely accepted work on Corporate Finance and valuations. In fact, a fundamental finding of M&M's seminal work is that the dividend policy (i.e. payout ratio) will have no effect on the value of the firm[12]. Under perfect market assumptions, the rational investor will be indifferent to receiving cash flow in the form of dividend or capital gains. The implication is that if management increases the dividend payout, it will have to reduce investments, thus reducing the intrinsic value of the firm and the terminal price of the stock. While correct, this violation does not reject the basic finding that multiples are explicitly driven by fundamentals.

[12] Miller, M. and Modigliani, F. 1961, *Op. Cit.*



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Next, equation (6) is particularly instructive to nullify one of the major myths "surrounding" multiples, i.e. that growth firms command a high P/E ratio (while value firms have low multiples!), a posturing statement at the base of an entire investment style and lucrative business model[13]**.** Applying the same fundamental analysis used above, it is easy enough to bust this myth or at least clarify what is meant by "growth", which growth? Indeed, using some basic equity algebra, we can define growth with the following equation:

$$g = ROE\ x\ (1 - Payout\ Ratio)$$

Now, assuming the firm management does not believe that a new investment will have a return (~ROE, ROI, ROIC) higher than the cost of capital *k,* management will logically and rationally return all Earnings to stockholders, otherwise management would destroy value. In that case, the payout ratio will be equal to 1 and the growth rate will be equal to zero as there is no new profitable (i.e. value creating) investment[14]. Equation (6) can then be rewritten as:

$$(7) \quad P = \frac{Earnings_1}{k} \qquad \boldsymbol{and} \qquad \boldsymbol{\frac{P}{E} = \frac{1}{k}}$$

That is, the price of the stock is simply the present value of a stream of Earnings all paid out as dividend, and the corresponding P/E is equal to the reciprocal of the cost of capital[15]. Thus, one paramount deduction from (6) is that stocks do not become "growth stocks" because Earnings are growing; they become growth stock only if investments are growing … and investments will grow only if they generate returns higher than the cost of funding them, i.e. returns greater than k. Thus, **growth is not THE driver of high P/E, excess return over the cost of capital is … and by-the-way, growth will generate value!** To quote M&M again, "*The essence of "growth", in short, is not expansion, but the existence of opportunities to invest significant quantities of funds at higher than "normal" rates of returns.*"[16]

The logic at the base of equation (7) is sometimes (regrettably) used as a conceptual cover by some analysts and investors to determine the aggregate cost of capital for a market or an economic system, i.e. determining *k as* the reciprocal of the P/E. The loose reasoning is that, if one is considering the entire economy as the market, or tacking an average of all sectors and industries, the original assumption of constant growth at the base of equation (5) makes sense

[13] The "growth" and "value" factors. Value Investment, for some reason, has completely lost its intrinsic value connotation and is now broadly defined as "… stock with low Price to Book ratio".

[14] If the payout ratio is equal to 1 (all the earnings are distributed as dividend), then:

$$g = ROE\ x\ (1 - 1) = 0$$

[15] Depreciation is equal to Capex , hence Net Operating Profit after tax is equal to cash flow.

[16] Miller, M. and Modigliani, F. 1961, *Opt. Cit.,* p. 417.



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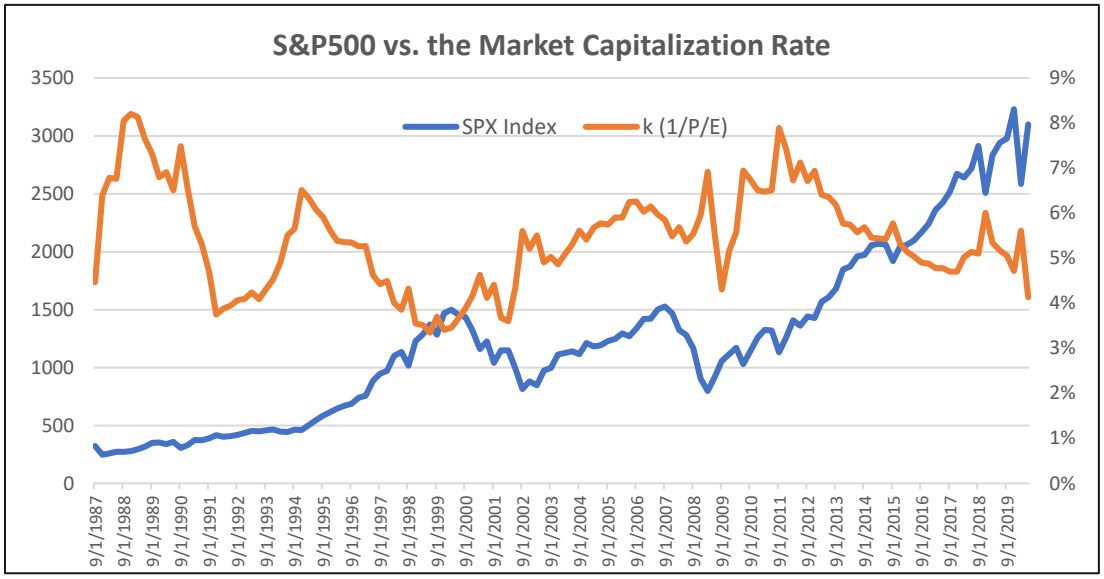
… and by deduction, equation (7). While that may be reasonable, the trouble is that the causality in (7) is completely and erroneously reversed: i.e., the "conventionally" determined P/E ratio is used as the input to determine the cost of capital instead of the other way around:

$$(7a) \qquad \hat{k} = \frac{1}{p/e}$$

Figure 1 below plots this "derived" measure ( $\hat{k}$) against the level of the S&P500 for well over three decades. The degree of dispersion and volatility of $\hat{k}$ over time is alarming if one were to methodically use this market metric to determine the intrinsic value of any investment or, worse yet, use it as a signal to invest. Now, some investors smooth out this cyclical volatility hindrance of the P/E by using cyclically adjusted Earnings, or the famous CAPE ratio (Cyclically Adjusted Price-to-Earnings Ratio) of Prof. R. Shiller[17]. However, and as further elaborated below in section 3, Earnings are just an accounting suggestion. Hence, cyclically adjusted Earnings (CAPE) are just an average of accounting suggestions[18] … i.e., *alchemy is prospering in the world of finance*.

**Figure 1**




Source: Bloomberg

Despite the restrictive assumptions, the steady state construct is sometime used to estimate (albeit very roughly) the level of expectation priced in the market. Recalling the M&M framework

[17] Campbell, John Y. and Shiller, Robert J. "Stock Prices, Earnings, and Expected Dividends" in *Papers and Proceedings of the Forty-Seventh Annual Meeting of the American Finance Association*, Chicago, Illinois, 28-30 Dec. 1987. *Journal of Finance*, vol. 43, no. 3, Jul. 1988, pp. 661-676.

[18] One of the top 5 U.S. investment houses actually calculates the market ERP (Equity Risk Premium, or cost of capital less the risk-free rate), by subtraction from the reciprocal of the CAPE a Zero-Coupon yield, all adjusted for inflation.



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mentioned above – i.e., the market value of a firm will be equal to the net cash flow to shareholders generated from existing asset plus the net present value of cash flow generated by future investments – Mauboussin and Callahan in a Credit Suisse study[19] apply this approach by disaggregating the P/E multiples into a steady state component (i.e., the cash flow generated by existing assets) and its residual, thus estimating by default the value attributable to future investment implied in the multiples[20]. Assuming (crucial assumption!) a known long-term/stable discount rate $\check{k}$, the authors capitalize the annual Earnings at this discount rate and then subtract the difference (if any) from the market level to find the amount of value creation "expected":

$$Anticipated\ Value\ Creation\ = Market\ Level - \ steady\ state$$

or

$$Anticipated\ Value\ Creation\ = Market\ Level - \ \frac{Earnings}{\check{k}}$$

Using a discount rate of 8 percent, they found that from 1961 to 2014, the steady state component implied by the market for the S&P500 explained about two thirds of the value, with the remaining one third representing the "anticipated value creation". The study however reported wild dispersion of this measure, with anticipated value creation going into negative territory and swinging back to above 60 percent. Currently (July 24, 2020) with the S&P 500 at 3,215.63 and using the same discount rate of 8 percent, this difference is a staggering 1,508.75 points of the S&P500, meaning that the market expects that almost 50 percent of value will come from anticipated (speculated) future increased investment activity! For this measure to collapse back to the roughly one third found by Mauboussin and Callahan (a long term albeit arbitrary "mean"), the discount rate would have to collapse to ~ 6.7 percent, a massive decline! Alternatively, the market would have to collapse to ~ 2,550, or a twenty percent selloff.

### 2.4 The multistage DDM

The constant growth rate assumption however is a very restrictive assumption and, indeed, it is the object of common criticism; fair enough as most firms experience variations in their growth cycles. The DDM construct nonetheless is easily (and normally) expanded without loss of concept and practicality to accommodate for different growth periods. I.e. the DCF is typically split in an initial high growth period, a transitional period, and a final "steady state" period, i.e. a three-stage DDM.

[19]Mauboussin, Michael J. and Callahan, Dan. "What Does a Price-Earnings Multiple Mean? An Analytical Bridge Between P/Es and Solid Economics." *Global Financial Strategies*, Credit Suisse, 29 Jan. 2014.

[20] A similar technique is also described in various publications by McKinsey, see "All P/E are not Created Equals", McKinsey on Finance, Spring 2004, pp. 12.



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Thus, this multi-stage version of the DDM, also derived and based on the gold standard of investment valuation, can also be matched with multiples in a closed format in order to formally derive and highlight the link to fundamentals. For ease of description in proofing and with no loss of concept we will use a two-stage DDM model instead, a high growth period and a steady state.

Extending from (1) above, the two-stage DDM equation can be written as:

$$(8) \qquad P_0 = \frac{Earnings_0\ x\ (Payout\ Ratio)\ x\ (1+g)\ x\ (1-\frac{(1+g)^n}{(1+k)^n})}{(k\ -g)} \quad + \quad \frac{Earnings_0\ x\ (Payout\ Ratio_n)\ x\ (1+g)^n x\ (1+\ g_n)}{(k_n+g_n)(1+k)^n}$$

Where:

$Earnings_0 =$ Earnings at time 0

*Payout Ratio* for the first $n$ years

$Payout\ Ratio_n$ after year $n$ and at perpetuity

$g =$ growth rate in the first n years

$g_n =$ growth rate after year n and in perpetuity

$k =$ Discount rate (a.k.a. required rate of return) for the first period

$k_n =$ Discount Rate after year n

Now dividing each side by $Earnings_0$ to get the P/E ratio as done above for equation (5):

$$(10) \qquad \frac{P}{Earnings_0} = \frac{\boldsymbol{P}}{\boldsymbol{E}} = \frac{(Payout\ Ratio)\ x\ (1+g)\ x\ (1-\frac{(1+g)^n}{(1+k)^n})}{(k\ -g)} \quad + \quad \frac{(Payout\ Ratio_n)\ x\ (1+g)^n x\ (1+\ g_n)}{(k_n+g_n)(1+k)^n}$$

Just like equation (6) above, **equation (10) clearly and unquestionably defines the P/E ratio in terms of fundamentals. Equation (10) quantitatively describe that the P/E ratio will increase**



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**with the payout ratio and the growth rate *g* for both the growth and the steady state periods. The ratio will instead decline if k and $k_n$ increase (if for example the ERP or the interest rate, or both increase).** Both equation (6) and (10) unmistakably prove the same reality: when used as value metrics, multiples must reflect the same set of fundamentals used in a DCF. Once again, the difference is that these fundamentals are explicitly "declared" in the DCF while they are implied (buried, concealed) in the multiples … i.e. defined by someone else and blindly accepted by the consumers of multiples.

Note that the findings of equation (6) and (10) above were based on the Price to Earnings ratio. It is relatively easy to come up with the same conclusions based on other popular multiples such as the Price to Book ratio by simply applying basic equity algebra.[21]Note in addition that the analytical framework exploited above can be applied also in case the firm does not pay a dividend. As mentioned above, a conclusion of M&M is that, if the analysis is carried out correctly, it does not matter which cash flow is used – e.g. the free cash flow, the stream of dividend or the stream of Earnings – the results will be exactly the same.

Despite the findings above, equation (6) and (10) or equivalently their discounted cash flow constructs continue to be broadly ignored, the former because of its restrictive assumptions (e.g. constant growth), the latter for its complexity and for its demanding input. Complexity? Agreed, if one has access only to an *Abacus*. Demanding input? For the layperson busy going through walks of life other than finance, no question. However, in today's world of quantum computing, Big Data, Machine Learning, Artificial Intelligence, etc., it is quite surprising that such a "wealthy" industry as the wealth management industry (forgive the punt) to these days prefers to rely on conventions and concealed assumptions instead of analytics and explicit expectations … *or rely on alchemy instead of science*!

## 3. Multiples: The Secular Underpinning

***"There is no way to carry on constructive discussion of an undefined concept."***

***Jack L. Treynor***

Having explicitly determined the links between multiples with the fundamental drivers of value, we can now turn to the analysis of the "conventional" bedrock for these popular value metrics. Again, the challenge here is the lack of theoretical origin, thus making it by default taxing to either appreciate or debunk the rationale behind the popularity of these metrics. Accordingly, and not for lack of curiosity and ambition, this section is bound to be somewhat descriptive, albeit and to the extent applicable referring to the analytical framework developed in section 2 above to draw conclusions.

[21] Hint: DPS = Book Value x ROE x Payout Ratio



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### 3.1 The Relative Valuation Approach

According to their conventional interpretation, multiples have literally zero meaning as an absolute value metric. For example, the widely quoted Price Earnings ratio only tells an "investor" how many years it will take to get back the initial monetary outflow or, conceptually equivalent, how much an investor is willing to pay for each $1 dollar of Earnings[22]. Those are not much of "absolute value" statements, e.g. a P/E of 10 times is not necessarily more or less attractive than a P/E of 15 times … *as they say, it depends*! Investors grounding their decisions to invest on this multiple are not paying for the stock immediate Earnings but for the future ones, i.e. they are purely speculating that those Earnings will stay put or improve. Furthermore, that practically implies that all the future Earnings would have to be paid out as dividends, which would very much be the exception and not the rule. In addition, if that were to be the case and recalling equation (7) and its derivation above, this would also mean that management does not believe that any new investments would generate returns higher than the cost of funding them. Thus, rational management would distribute all the Earnings to the investor, i.e., value creation would be zero! Hence, very few serious investors would argue for value based on the absolute level of a multiple only and in a vacuum, that is without additional analysis or data … *it would depend!*

Thus, normally, and instead multiples are used as relative value indicators, that is, they are used to compare the price of a stock relative to some reference benchmark. The idea is that this approach may allow to spot discrepancies and therefore value that can possibly be arbitraged, an overly simplistic[23] yet extremely popular approach broadly referred to as mean reversion. Typically, the reference point, i.e. the mean, is defined with respect to time (history), comparable assets (e.g. other stocks, sectors, industries, etc.), or markets (e.g. countries, benchmarks, etc.). As it should appear immediately obvious, this approach is totally dependent and skewed by the selection of the reference point, i.e., the mean. For example, in the year 2000, a Dot.com stock trading at 100 times may appear outrageously expensive when compared to the historical mean of ~ 15 times for the S&P500; yet, the same stock may be outright cheap when compared with the market mean for all Dot.com stocks trading at 200 times Earnings!

To start with, a common practice out there is to relate current multiples to historical averages. The conceptual foundation is that long term capitalization rates of an economy do not change much over time, even if economic structures mutate markedly – note: retail or energy are vastly different now than just 5 or 10 years ago. The argument goes that cycles pushing Earnings above long-term levels will eventually end while sectors or industries enjoying return on investments higher than normal will see their comparative advantage dissipate with competition and time. I.e. economies, sectors, and businesses will naturally trend towards the steady state. That is, in terms of equation (7) above, markets and stocks will over the long-term trend towards their

[22] Some erroneously also call it "equity duration", equating it to the very rigorous, analytical, and meaningful metric for bonds.

[23] If one blindly believes in the stability (stationarity) of the mean -- as everyone using this approach implicitly does -- one only needs to know how to add or subtract, literally!



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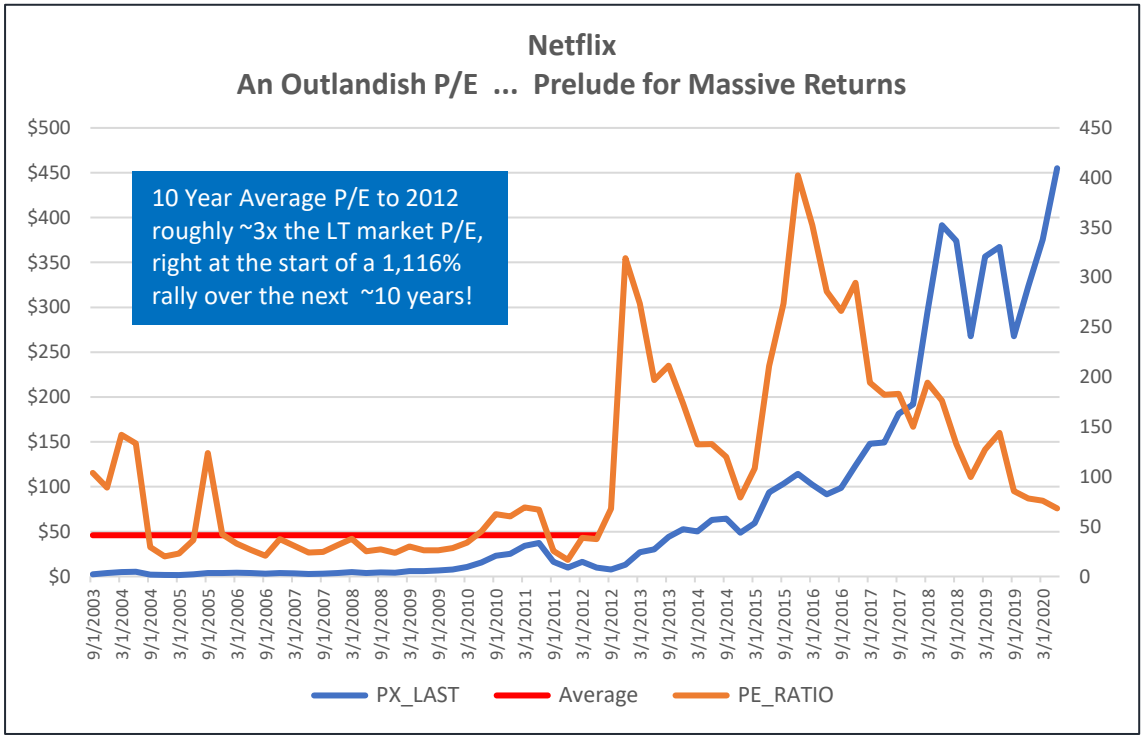
respective $\frac{1}{k}$, the steady state P/E. [24] Thus, any deviation from this "biblical" rate will be arbitraged away … eventually! The trouble with this approach is well quipped by Warren Buffett "*If history is all there were to the game, librarians would be the richest people in the world.*" The following graph illustrates this point succinctly: based on this approach alone, had one relied purely on historical averages of P/E ratios (stock versus market), one would have sold Netflix … right at the onset of a massive rally. The current (2018 to date) "frustration" of sitting out massive rallies in the technology sector on the count of wrong signals coming from stratospherically high multiples should be sufficient to generalize the Netflix example. Possibly in fact, the overreliance on multiples to assess value and pick stocks may be one of the reasons behind the generalized poor performance of most discretionary (active) investments strategies.

**Figure 2**




Source: Bloomberg

Even assuming that comparisons with historical averages are fair game, the question remains: which historical period? The last 100 years? 50 … 30 … 20 years? A question with many, albeit all subjective answers. In addition, the dilemma is that as illustrated in Figure 3 below, the P/E ratio can exhibit quite a bit of dispersion around pretty much any mean (arbitrarily) selected, swinging by more than 50 percent from peak to trough, several times during the 30 years reported.

[24] John Maynard Keynes famously wisecracked: *"In the long term we are all dead."*



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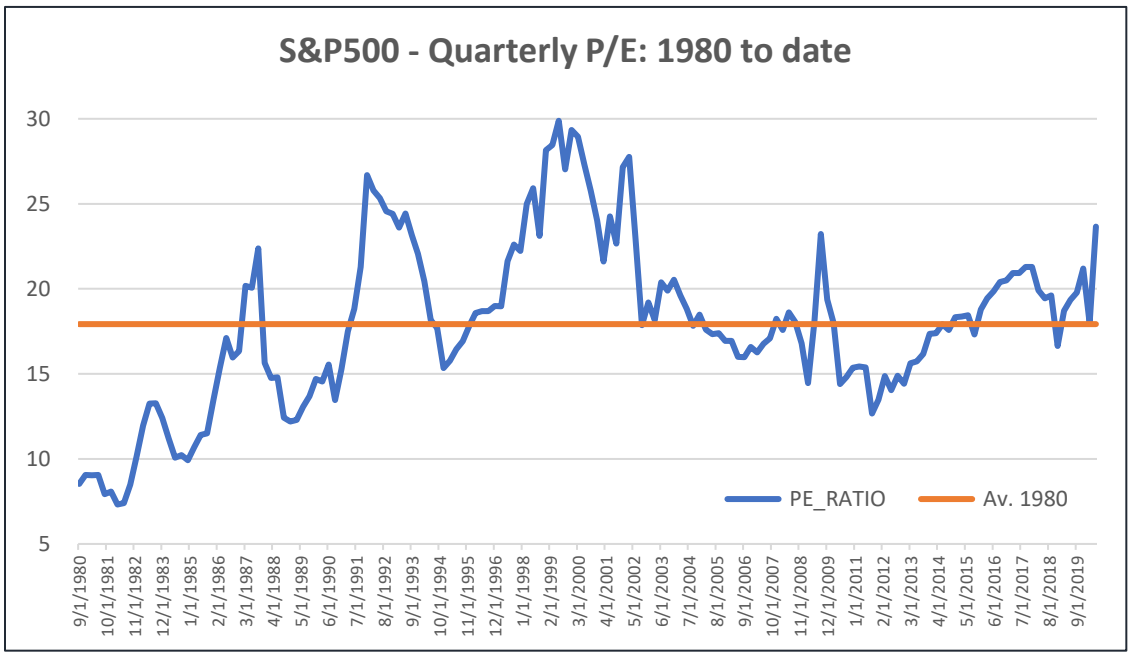
**Figure 3**




Source: Bloomberg

In order to remove both the Earnings volatility and the (arbitrary) selection of the historical period, Nobel Laureate R. Shiller developed an ingenious methodology, the Cyclically Adjusted Price Earning, defined as the ratio of the current stock price divided by a 10-year moving average of inflation-adjusted Earnings. The approach makes total conceptual sense as the average Earnings of a cycle will have much better information contents than the Earnings of a single (random) year. Despite its popularity however, the CAPE has failed to provide a reliable investment signal, in particular continuing to point to sizeable market overvaluation by remaining above the historical average for the better part of the last 30 years, with the notable exception of 2009 (see Figure 4 below). As further elaborated below in Section 3, while the CAPE concept is convincing, the problem may very well be with the Earnings, a variable that is derived applying accounting guidance and suggestions, thus making the CAPE an average of "suggestions"!



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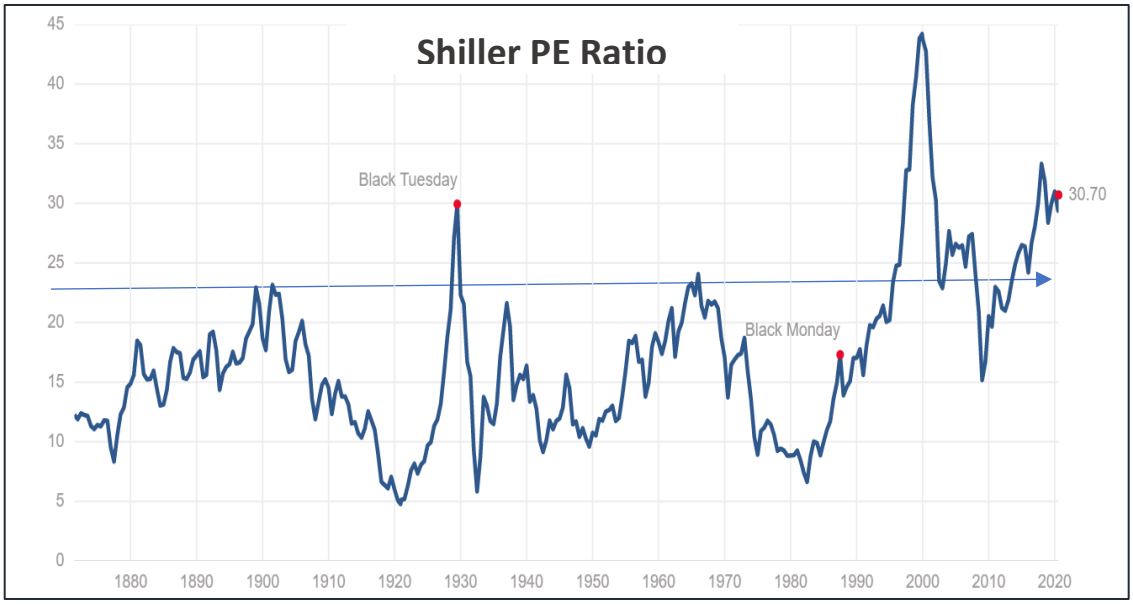
**Figure 4**




Source: https://www.multpl.com/shiller-pe

The next common application is to relate equity multiples to one or more comparable firms, the logic being that similar business will have similar capital requirements, similar capital structure, will be dependent on the same economic trends, will have similar profit margins and risk, and will face similar competition. It stands to reason therefore that they should also have similar valuation … and, according to convention, they should also have similar multiples!

In a perfect market, there is no question that that should be the case, especially if the comparison is based on the same set of fundamental value drivers … i.e., the same set of fundamental drivers identified in equation (10) above! The trouble is that it is extremely difficult to find two businesses that are the same or at least "within the ballpark" to justify comparisons and assess value. And it is equally difficult to substantiate this approach empirically.

Table 1 below reports the main fundamental value drivers together with the main multiples for the most popular Tech stocks, i.e. the famous FAANG[25] group slightly expanded. The last line reports the deviation of each variable from its mean. As can be appreciated, the deviation is massive in pretty much all cases, making any comparison futile. Yet, these names and their multiples, together or worse yet as a group, are very often referred to when debating value in the entire Tech sector.

[25] Facebook, Amazon, Apple, Netflix, Google



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**Table 1**

| Name | Market Cap (in B | ROIC * | Cost of Equity ** | Long Term Growth | P/E | P/B | EV/EBITDA |
|---|---|---|---|---|---|---|---|
| Apple Inc | $1,863 | 28.76 | 8.61 | 11.60 | 33.40 | 26.03 | 22.46 |
| Amazon.com Inc | $1,559 | 9.42 | 7.00 | 32.26 | 121.69 | 21.51 | 35.96 |
| Alphabet Inc | $1,006 | 13.42 | - | 15.83 | 33.92 | 4.86 | 18.88 |
| Facebook Inc | $ 718 | 21.03 | 8.42 | 23.69 | 30.81 | 6.51 | 18.95 |
| Alibaba Group Holding Ltd | $ 692 | 7.40 | 10.70 | 23.50 | 44.23 | 6.44 | 36.50 |
| Tesla Inc | $ 277 | 4.32 | 12.15 | 35.00 | 646.62 | 28.33 | 70.96 |
| NVIDIA Corp | $ 271 | 20.15 | 10.55 | 18.78 | 82.43 | 20.87 | 65.86 |
| Netflix Inc | $ 220 | 14.13 | 7.39 | 32.13 | 75.68 | 23.87 | 57.73 |
| Baidu Inc | $ 42 | 1.26 | 10.94 | 7.00 | 20.66 | 1.83 | 16.70 |
| Twitter Inc | $ 29 | (11.61) | 10.01 | 9.50 | -- | 3.76 | 52.88 |
| **Average** | **$ 667** | **10.83** | **8.58** | **20.93** | **121.05** | **14.40** | **39.69** |
| **Deviation from the mean** | **$ 604** | **10.87** | **3.26** | **9.53** | **188.32** | **10.00** | **19.69** |

Source: Bloomberg as of August 4, 2020. *Return on Invested Capital. ** As calculated and reported by Bloomberg.

Table 2 below reports the same variables for a group of US National regulated utilities, that is a group of stocks which can justifiably be classified as “steady state” businesses and are therefore highly and directly comparable. Despite the more homogenous and legitimate grouping, the deviation from the average for each variable is nonetheless large enough to challenge comparisons across businesses that should be extremely similar.



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**Table 2**

| Name | Mkt Cap | ROIC * | LT EPS Growth | Cost of Equity** | P/E | P/B | EV/EBITDA |
|---|---|---|---|---|---|---|---|
| NEXTERA ENERGY INC | $ 137,748 | 6.10 | 8.63 | 8.01 | 32.43 | 3.72 | 17.21 |
| DOMINION ENERGY INC | $ 67,719 | 4.76 | 3.54 | 7.32 | 15.76 | 2.56 | 9.16 |
| DUKE ENERGY CORP | $ 62,108 | 4.38 | 4.02 | 8.47 | 16.40 | 1.38 | 11.16 |
| SOUTHERN CO/THE | $ 57,554 | 4.38 | 4.30 | 8.96 | 17.43 | 2.08 | 11.86 |
| EXELON CORP | $ 37,545 | 5.79 | 1.39 | 9.26 | 13.04 | 1.16 | 7.25 |
| XCEL ENERGY INC | $ 36,643 | 6.01 | 6.04 | 8.32 | 26.12 | 2.74 | 13.00 |
| WEC ENERGY GROUP INC | $ 30,187 | 6.43 | 6.39 | 8.46 | 25.86 | 2.92 | 15.90 |
| PUBLIC SERVICE ENTERPRISE GP | $ 28,231 | 5.52 | 4.29 | 9.26 | 16.27 | 1.82 | 11.16 |
| CONSOLIDATED EDISON INC | $ 25,510 | 6.07 | 3.35 | 6.94 | 17.68 | 1.40 | 10.46 |
| DTE ENERGY COMPANY | $ 22,265 | 5.30 | 6.00 | 9.55 | 17.80 | 1.90 | 12.08 |
| EDISON INTERNATIONAL | $ 20,810 | 5.01 | 4.26 | 8.99 | 13.70 | 1.46 | 10.19 |
| ENTERGY CORP | $ 20,713 | 5.49 | 5.06 | 9.58 | 10.03 | 1.99 | 7.92 |
| AMEREN CORPORATION | $ 20,033 | 5.88 | 7.03 | 8.14 | 25.69 | 2.48 | 12.26 |
| Median | $ 19,064 | 5.90 | 4.73 | 8.91 | 17.73 | 1.85 | 11.16 |
| CMS ENERGY CORP | $ 18,096 | 5.91 | 6.93 | 8.25 | 22.97 | 3.47 | 12.77 |
| ALLIANT ENERGY CORP | $ 13,426 | 7.56 | 5.46 | 8.77 | 21.51 | 2.44 | 13.63 |
| EVERGY INC | $ 12,593 | 5.31 | 6.33 | 9.09 | 19.38 | 1.48 | 10.38 |
| CENTERPOINT ENERGY INC | $ 9,961 | 4.59 | (1.59) | 11.07 | 9.01 | 1.90 | 8.02 |
| PINNACLE WEST CAPITAL | $ 9,157 | 6.01 | 4.78 | 9.17 | 17.76 | 1.67 | 11.01 |
| OGE ENERGY CORP | $ 6,606 | 8.44 | 3.59 | 10.17 | 12.95 | 1.86 | 10.83 |
| IDACORP INC | $ 4,617 | 6.87 | 3.00 | 8.71 | 19.73 | 1.85 | 12.90 |
| HAWAIIAN ELECTRIC INDS | $ 3,918 | 6.48 | 2.92 | 6.87 | 18.99 | 1.72 | 8.30 |
| PORTLAND GENERAL ELECTRIC CO | $ 3,827 | 6.51 | 4.69 | 8.86 | 16.26 | 1.45 | 8.07 |
| BLACK HILLS CORP | $ 3,589 | 5.93 | 5.57 | 9.89 | 15.31 | 1.42 | 12.24 |
| PNM RESOURCES INC | $ 3,395 | 5.60 | 5.32 | 10.86 | 17.79 | 2.00 | 10.08 |
| ALLETE INC | $ 3,135 | 4.90 | 6.40 | 8.68 | 17.70 | 1.38 | 12.14 |
| NORTHWESTERN CORP | $ 2,871 | 6.10 | 3.80 | 10.44 | 17.81 | 1.50 | 11.89 |
| Average | $ 25,234 | 5.82 | 4.68 | 8.92 | 18.26 | 1.98 | 11.22 |
| Deviation From the Mean | $ 28,388 | 0.89 | 1.95 | 1.01 | 4.98 | 0.63 | 2.28 |

Source: Bloomberg as of August 4, 2020. *Return on Invested Capital. ** As calculated and reported by Bloomberg.

Despite the shortcomings, this "comparable" methodology is nonetheless well-established in both market parlance and practice. It is indeed popular and widely used by investment bankers when pricing brand new stocks, i.e., in Initial Public Offering (IPOs)[26]. However, while the reference to comparable may make sense during an IPO, the purpose should be limited to providing "extra color" on current market conditions, sentiments, and pricing timing, leaving the determination of intrinsic value to more reliable fundamental-driven methodologies based on explicit fundamental assumptions … an approach that all investment bankers should be very familiar with and most likely prefer were it not for the market convention!

The third common application mentioned above is to compare equity multiples across markets and countries. And here is where the proverbial "apple to orange" comparison should be abundantly obvious … and painless to discard. Yet, it is in fact all too common to come across

[26] For a thorough review of this practice, see Rosenbaum, J., Pearl, J. *Investment Banking*. John Wiley & Sons, Inc., 2009.



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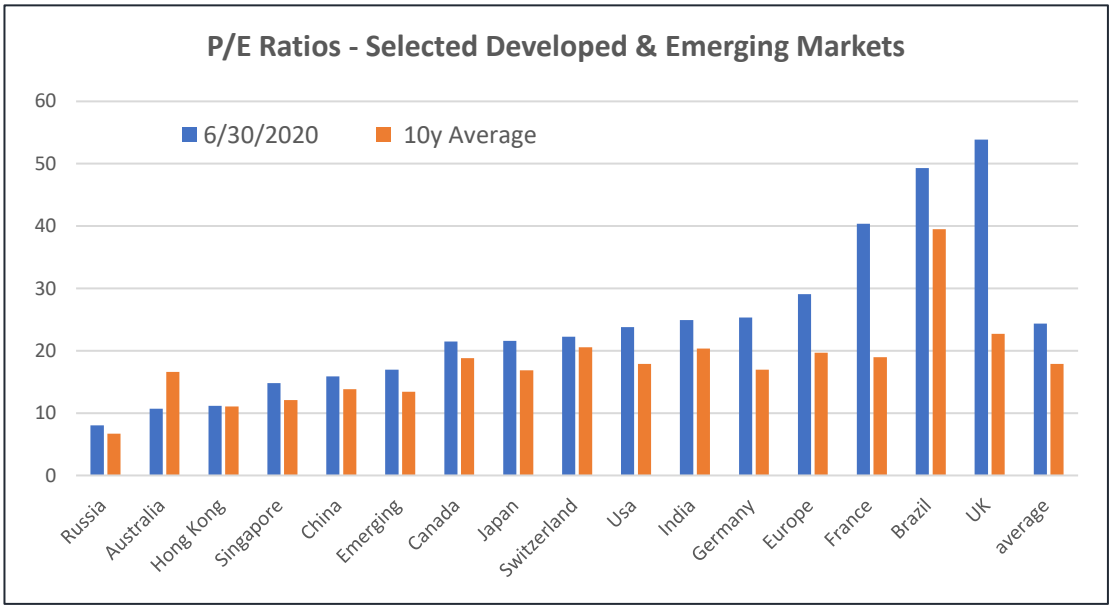
statements in the financial media and specialized research boasting that one country or one region is cheaper than another, e.g. "… the Emerging Markets P/E are trading at a historical discount relative to Developed Markets!" The hard reality is that regions, countries, and markets move based on their own ecosystem with sizeable dispersion in growth rate, inflation, political and credit risk, fiscal and monetary stances, accounting standard, financial penetration, etc., all impacting fundamental drivers of value differently. Figure 5 below graphs the current P/E and the 10-year average P/E for a selected group of developed and emerging markets. As can be seen, the dispersion from the lowest multiple (Russia) to the highest (the UK) is staggering. Now, the objection to this comparison will immediately be that there are obvious structural differences between the economies of these two extremes … and that is exactly the point! They are different and cannot and should not be compared … *one is an apple, the other an orange!* Remarkably, the difference is equally staggering between Russia and Brazil, both Emerging Markets, and both commodities exporters. Thus, relying on equity multiples to assess and rank value across regions, countries and markets is just senseless if not outright (financially) dangerous.

**Figure 5**




Source: Bloomberg

## 3.2 The Conundrum: Accounting or Economics?

One further hindrance affecting Multiples is the reliance on accounting principles to determine economic concepts and finance quantities such as value, a conceptual leap filled with froth. While accounting is a reputable, legitimate and crucial discipline, it is not a perfect science as it is structured around a series of principles and guidelines with indispensable leeway to accommodate for specific situations to improve the accuracy of the reporting process. This leads invariably to interpretations which, albeit totally legitimate, distort comparison of financial variables across markets and individual stocks. Not to mention distorting metrics depending on these results, i.e. Multiples.



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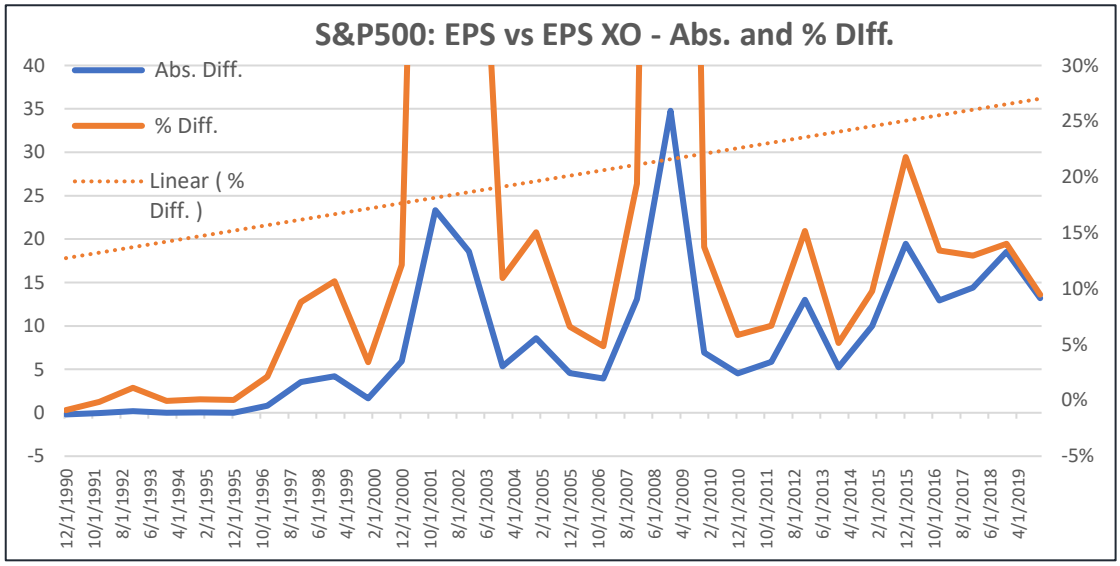
Indeed, Earnings, or the crucial drivers of several Multiples, are derived from financial statements built in turn by applying a plethora of accounting guidelines differing across countries, markets, industries, etc. Yet, Earnings are (and should be) Earnings, no matter the origins; they should be universally comparable and safely quoted across markets and securities. Not necessarily the case and the practice out there.

As a glaring example, financial accounting does recognize and provide clear guidance in treating gains or losses from events that are unusual and infrequent, i.e., extraordinary items/events such as the sale of a warehouse no longer used for operations. And financial accounting does correctly provide for properly reporting Earnings before and after the extraordinary event. The trouble is that the Earnings used to calculate the quoted P/E is the Earning affected by the extraordinary event. The graph below reports the difference between these two "versions" of Earnings for the S&P500 for the last thirty years:

**Figure 6**




Source: Bloomberg

As can be appreciated, the difference is not only sizeable but has been on an upward trend for the last 30 years reported in the graph. The impact on the P/E using the two different versions of Earnings is equally sizeable. The graph below illustrates this point by reporting the percentage of underestimation of the P/E ratio using the final Earnings instead of Earnings before extraordinary items. The conclusion is the same: an ever and growing presence of items that are considered, i.e., justified by the accounting principles, "unusual and infrequent"! And yet, most of the financial media "narrates" only on the basis of the final reported "unusual" Earnings and then goes on to compare it with history, markets, etc. This in turn is leading others to refer to good-old mean-reversion arguments, comparing historical "usual" Earnings with "unusual" ones … *the alchemy of finance continues to prosper!*



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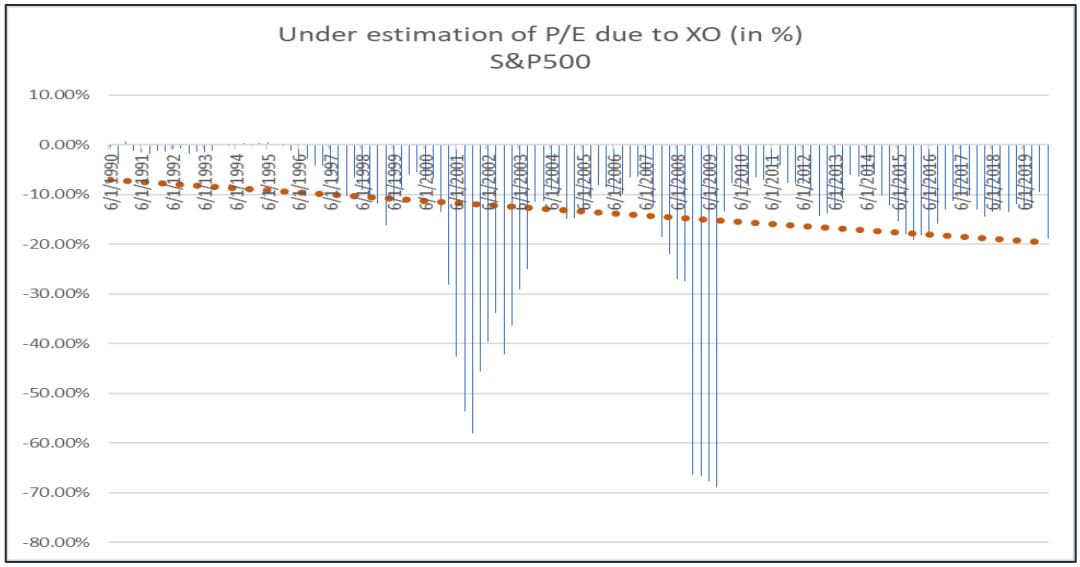
**Figure 7**




Source: Bloomberg

Table 3 below extends the same exercise across a few selected well-advanced markets reporting the percentage difference between final Earnings and Earnings before extraordinary items. The curious thing is that the extraordinary items seem to occur with frequency and size only in the US markets. Even removing the US small caps (RTY) massive dispersion from the table, the difference between the S&P and other major benchmarks is staggering … these "other" markets never seem to suffer either gain or pain from extraordinary events, and when they do, the impact is miniscule … *intriguing!*

**Table 3**

| | SPX | RTY | SXXP | TPX | UKX |
|---|---|---|---|---|---|
| 12/31/2002 | 68.12% | -192.82% | 2.80% | 0.29% | 3.44% |
| 12/31/2003 | 10.97% | 264.34% | 1.27% | 2.63% | 2.78% |
| 12/31/2004 | 15.06% | 76.81% | 0.73% | 0.00% | 0.46% |
| 12/30/2005 | 6.60% | 30.05% | -1.06% | 0.02% | -0.90% |
| 12/29/2006 | 4.86% | -10.63% | 0.86% | 0.04% | 1.35% |
| 12/31/2007 | 19.42% | 77.57% | 1.26% | 0.04% | 0.78% |
| 12/31/2008 | 182.86% | -111.65% | -3.20% | -0.17% | -22.18% |
| 12/31/2009 | 13.73% | -227.56% | 1.47% | -0.36% | 2.99% |
| 12/31/2010 | 5.86% | 6.49% | -0.39% | 0.02% | 0.61% |
| 12/30/2011 | 6.68% | 37.91% | -1.16% | 0.00% | 0.31% |
| 12/31/2012 | 15.17% | 63.19% | -0.29% | -0.02% | 0.72% |
| 12/31/2013 | 5.15% | 38.79% | 0.86% | 0.01% | 1.33% |
| 12/31/2014 | 9.78% | 41.88% | -1.51% | 0.01% | -2.01% |
| 12/31/2015 | 21.78% | 11107.41% | 0.07% | -0.03% | 0.03% |
| 12/30/2016 | 13.43% | 154.59% | 0.86% | 0.00% | 0.67% |
| 12/29/2017 | 12.97% | -1104.93% | -6.19% | -0.01% | 0.57% |
| 12/31/2018 | 14.03% | 179.97% | -1.57% | 0.01% | -6.34% |
| 12/31/2019 | 9.48% | 1841.21% | 0.88% | 0.00% | 0.05% |
| **Average** | **24.22%** | **681.81%** | **-0.24%** | **0.14%** | **-0.85%** |

Source: Bloomberg. RTY= US small caps, SXXP= Europe, TPX= Japan, UKX=UK Footsie 100.



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Now, nitpicking on the instances of the impact that accounting principles have on valuations, albeit a prolific subject, is well beyond the scope of this paper[27]. The purpose of this final section instead is to generally expose this other "inconvenient truth" afflicting multiples.

Accordingly, a more constructive way to generalize and assess the influence that accounting has on financial analysis is to recall the seminal work of Jack Treynor[28], both a practitioner and a luminary of finance, part of a small group of exceptional thinkers that shaped modern finance. In a most famous and acclaimed 1972 paper, "the Trouble with Earnings"[29], Treynor brilliantly and conceptually exposed the pitfalls of mixing together accounting practices and financial principles. The author first draws attention to and defines the different meaning of Earnings for the financial analyst and for the accountant. For the former, Earnings are unambiguous and have a well-defined economic meaning. For the latter, Earnings instead are the result of applying a series of mechanical "rituals" to estimate "current value" of assets in the development of Earnings. The accountant defines Earnings as the result of matching costs with revenues, making in the process plenty of necessary yet subjective allocations to costs which will differ depending on the individual situation … for example, depreciation. Using these different (and often conflicting) definitions, Treynor then famously goes on highlighting and warning on the circularity of this set up:

*"If Earnings is the difference between the worth of the firm at the beginning and the end of the accounting period, then analysis of a firm's worth logically precedes measurement of Earnings, rather than the other way around"*

Yet, and here is the conundrum underlined by Treynor, the analyst uses the findings of the accountant to determine (economic) value. Treynor thus concludes that "… the controversy will disappear only when the concept of accounting Earnings loses its central role in securities valuation."

Treynor applied this framework in another famous article recounting the accounting and valuation trials and tribulations of an imaginary fast food firm named "Feather Feast"[30]. The firm goes from boom to bust. In the boom period, the accountant depreciates the asset across 12 years; a very conservative "judgment" given the boom and given that the economic life (of the business and the asset) could easily be "forecast" to be 30 or 40 years by an economist or financial

[27] For the sceptics, please note the seldom but unfortunately practiced form of aggressive accounting, legal in most cases yet distorting. See for example https://www.accountingtools.com/articles/what-is-aggressive-accounting.html.

[28] Jack L. Treynor, was a key member of a tiny group of theorists from which the efficient market hypothesis (EMH), the capital asset pricing model (CAPM), and the random walk hypothesis emerged in the 1960s. In the words of Robert Merton, a Nobel laureate, Treynor was "… a leader in the intellectual development and incorporation of modern finance into practice". Although others who worked on related ideas received Nobel Prizes, Mr. Treynor is recognized as one of the discoverers of the capital asset pricing model (CAPM), a cornerstone contribution to finance that codifies the role of risk in expected investment returns.

[29] Treynor, Jack L. "The Trouble with Earnings." *Financial Analysts Journal*, vol. 28, no. 5, Sep-Oct. 1972, pp. 41-43.

[30] Treynor, Jack L. "Feathered Feast: A Case." *Financial Analysts Journal*, vol. 49, no. 6, pp. 9-12, 1993, doi: 10.2469.



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analyst. In the bust period however, 12 years suddenly become "aggressive"; indeed, revenues do not even cover costs to start with in this period. Feather Feast's CEO, concerned about the impact on valuation of the accounting practice, decides to consult the most reputable and highest accounting authority. Besides being amusing and a literary jewel, the answers of the (imaginary) accountant would make the most twisted pretzel look like a straight breadstick (worth reading!).

Indeed, it may be this latter article and its findings that has led many pundits to conclude that financial Earnings are just a "suggestion." And it may have been this same article that has led others to go even further and quip "*Cash (flow) is a fact, Earnings is just an opinion*".

## 4. Conclusions

Whether analytically, descriptively, or practically, the principal conclusion of this paper is that Multiples have no theoretical underpinning and, more to the point, have zero economic value meaning. They remain for all intents and purposes a matter of market convention and convenience. Indeed, the myths and manias of using them in investment parlance may have more to do with behavioral sciences than finance or economic science; as the title of this paper insinuates, multiples might be a perfect example of *financial alchemy*!

As presented in our analysis, Multiples are "alleged" to incorporate into one single number the combined economic impact of several drivers of value, such as profitability, risk, cost of capital, growth, time, etc. The snag is that the value of these drivers is hermetically concealed into one ratio, e.g. a ratio that, as put by Jack Treynor "… *has taken on a kind of mystical significance completely unrelated to economic reality.*[31]" To that end, Multiples are of little use to the fundamental investor concerned primarily with extracting from current market conditions the implied expectation for these drivers and then assessing their likelihood. I.e. multiples are of little use to fundamental investors that would rather dissect the present instead of blindly forecast the future … very often a painful exercise in overconfidence.

Our postulate is that, while it was defensible to use Multiples during the time of "Abacus and small data", it is reprehensible that in the modern time of quantum computing, Big Data, AI, FinTech, etc. multiples continue to be widely preferred over more robust, gold-standards of valuation grounded on sound economic principles. Thus, our conclusions and practitioner recommendation are to treat multiples for what they are: a widely popular momentum indicator and a barometer of market sentiment.

[31] Treynor, Jack. 1972. *Op. CIt.*



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