FCL*Capital*

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A matter of chance

“Im only human
Of flesh and blood im made
Human
Born to make mistakes”

(From the 80s hit song ‘’Human’’)

Human beings are born to make mistakes. And despite the extraordinary explosion of information in the investment arena - now surrounded by Bloomberg Terminals and non stop news flow- the hard fact is that the basic inputs and outputs about investing haven’t changed that much in the past 100 years- we collectively make informed guesses about the future of specific assets and asset classes and the sum of our opinions shows up in prices.

Two basic facts make the puzzle of investing-possibly the definitive human puzzle- specifically interesting.

The first is our limitation as human beings about guessing and knowing about the future, a theme which we discussed in our past letters about forecasting. [1]

The second interesting thing is the incredible tendency of the the collectivity of investors - known as a market - to deviate from cold blooded rationality - thanks to the twin gods of greed and fear.

1 Most recently in our September 2015, January 2016 letters and in our letter about the book ‘’Superforecasters’’.

A recent paper by two fund managers put these tendencies incredibly clear: participants were each given $25 and told to bet on a rigged coin that had a 60% probability of landing heads. The money prizes were all real, although capped at $ 250 per participant.

Almost a third of participants, despite knowing the fact that the coin was rigged went completely burst- they just started betting too aggressively or after a few successive losses inexplicably switched sides, became too nervous and started betting tails.

Only a fifth of participants were really able to game the system and reach the $250, they basically did the right strategy and kept betting heads every time no matter how many rounds they lost. Eventually of course the 60% chance of a coin toss landing heads became decisive and assured that they made money. If played enough times, a tendency finally appears after all. But this is being said while i write this letter with no emotion at stake. During the game many of the players- some of them professional money managers, some of them high level executives, lawyers, doctors and so on- eventually lost faith in themselves or in simple mathematics and lost everything until their last dime.

And what is the optimal strategy for a game like this? First of all, of course, since the game is rigged, to bet heads in every round. It is sometimes easy to forget, but each single round is completely independent and no matter how many times in a row the coin lands tails, there is still a 60% chance of winning if you bet heads next time. Therefore if the last round was heads or not, this is completely irrelevant. In the next round keep betting where there's a 60% chance of winning and eventually maths comes back with a vengeance. Just like value investing in the stock market.

Second, just like no matter how certain you are on a particular investment opportunity you should always to some extent spread your bets, likewise, the right strategy for this game was obviously not to bet everything on first round since there was still a 40% chance of losing and the more times you bet heads the more chance you have of eventually winning.

Actually, the optimal strategy for a game like this has been in mathematical literature since 1955. It is known as the Kelly Criterion. It holds that you basically should bet a constant percentage proportion of your money every time. [2]

In a repeated game with a known probability, you should basically double the probability of winning and subtract one. Therefore, start betting 20% of your money (0.60 * 2 - 1). Do that and there is a 95% mathematical chance of eventually reaching the maximum $ 250.

But that's the theory. In the game itself, amazingly two thirds of players bet on tails at least once, despite knowing they would only have a 40% chance of winning. Probably they thought - like so many money managers - that they were on a ``winning streak`` or on a ``losing streak`` or that since many heads happened now there would have to be some miraculous form of ``compensation``.

The possibilities for human beings to practice their irrationality are endless.

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2 Once again, in a similar fashion to many wealth planning advisors when it comes to asset classes like stocks, bonds, private equity and so on.

Betting on a financial asset- be it a beach front residential estate, a technology stock or a bond- is obviously more complex than betting on a coin. You have to make your chances go up - they are not fixed - so the state of the economy, the corporate governance of companies, the credit cycle, all play a part in this more complex betting game that is investing. The more you study and the more insightful are your thesis the more rigged your coin becomes.

The good news is that In the long run stock investing is not that different than gambling with a loaded coin in your favor-after all the stock market does go up over the long term since we as a society keep progressing. Keep invested in the stock market of any economy that is not about to go into war and that has a population that is not fastly declining and chances are that after a few decades you will have made a lot more money than if you had invested in fixed income or even if you had invested in the vast majority of private business opportunities apart from a few extraordinary ones.

Besides, there is one huge advantage in stock investing as compared to coin flipping- each bet is not made in isolation. We can, as a matter of fact, take advantage of the irrational behavior of other participants - when they are particularly irrational, if we are able to use that in our favor the game becomes especially rigged for us (although very few have the necessary discipline and level headness to take advantage of that) .When, as in most times, the participants are reasonably rational the game becomes a bit tougher and the odds a little closer to even.

The Kelly Criterion also holds that the more certain you are of a especific outcome (and note humans have a tendency to overestimate their probability of success) the more you should bet on it. This should work for asset classes (bet heavily on the stock market when stocks are particularly undervalued) as well as specific investing ideas.

In the past month all of these philosophical, mathematical and practical thoughts ran through our heads in our largest investment: Braskem.

Being our largest position, surely, since we try to be rational beings, we believe it is one where we thought we had an edge. But investing is and will always be a probabilistic activity.

With the very negative news flow of Braskem mired in the ``Lava Jato`` scandal and the company's previous Chairman being arrested, Braskem, a world class company was basically trading at half the price multiples of its international peers.

	EV/EBTIDA (2017E)	Free Cash Flow yield (2017E)
Braskem	3.3	24%
Lyondell Basel	6.41	8.61%
Basf	6.9	5.26%
DOW	7.88	6.45%

Our rational bet (our rigged coin if you will) was that eventually a settlement would be reached and investors would once again pay attention to the company's value. Sure, this was an idea for investors able to stomach strong short term volatility in exchange for long term gain.

Tellingly, there were times this year, when the stock was nose-diving, that this position exceeded 20% in our portfolio, very close to the ``rigged coin`` example as dictated by the kelly criterion.

As we write this letter, news of an imminent settlement between Braskem and the Brazilian, American and Swiss authorities emerged. If the penalty imposed on Braskem is the one being mentioned in the media, we calculate it at no more than 2% of the company's net present value.

Cold mathematics would dictate that Braskem should double in price and that has been the main rationale for our thesis in the past few years. [3]

Obviously, reality is more complex. More negative news could emerge. And also, the parent company could use Braskem, to bear most of the brunt, since the company is so healthy.

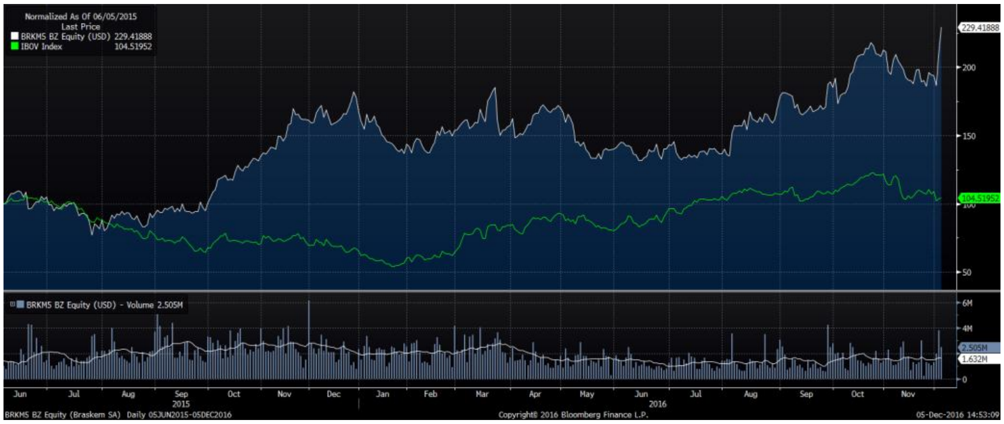
3 Braskem was already heavily discounted before the Lava-Jato incident for different reasons.

We do not believe this will be case. Recent media reports state that Braskem will pay roughly half the total Odebrecht settlement. We think this is unfair - Braskem after all, is only indirectly involved in the worst allegations and is not a public contractor, which is the heart of the scandal. Nonetheless, the shares rallied with the news and with good reason. But if a worse outcome than this emerges - Odebrecht using its controlled company as a piggy bank, our investors should know that we will not hesitate going to go to any lengths , including judicial means , to prevent this from happening. We are not overly concerned and do not think this will be the case.

All in all the news was a major positive: as our thesis implied, once the veil of uncertainty was lifted, investors started to realize the company was trading at basically half of what could be an appropriate price.

This does not mean, of course we will sit and watch the shares double in price. Some imminent negative piece of news could still emerge. And even if the shares eventually double in price, probably as they approach what we think are reasonable levels, the old Graham’s concept of margin of safety dictates we should start selling. We don’t want to wait until it they completely converge. Safety is more important than grabbing the last penny.

Finally, we do think Braskem should trade at some discount, although a lot smaller than the current one.



Braskem (+ 128%) vs Ibovespa (+ 4,6%) in US Dollar terms in the past 6 months. 4

There are still many rigged coins out there in global financial markets. This was just one of them. From time to time we will err on our calculations and make mistakes, but overall we will try to keep flipping to take profits out in this game. One thing that makes us think we can be successful is the fact that other investors are still making some giant mistakes and showing remarkable irrational behavior, worse than betting tails on a rigged head coin are out there. They trade short term security for long term success. These rigged coins are out there. We will keep searching for them

4 Note the inflection point reached in the past couple of days when news of the settlement emerged.

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ANBIMA A presente instituição aderiu ao Código ANBIMA de Regulação e Melhores Práticas para os Fundos de Investimento.

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