



Were financial markets (in)sane in 2020?



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ABSTRACT

Relative to other global institutions, financial markets performed remarkably well in 2020 and investors ought not to be ashamed of their reactions relative to consumers. It would be a terrible abuse of language to characterize 2020 as being financially irrational. The Covid crisis in 2020 was one of the most orderly crises ever. The damage and the reward across companies, sectors, and countries made a lot of sense. Although there are pockets of extremely high valuations in the tech sector, humility has always been a virtue when it came to valuing tech firms. While stocks are very expensive in absolute terms especially in the US, they are not relative to governmental bonds. But there is a big caveat to all this: the rise in the monetary supply since 2010 has been so incredible that markets have dived deep in uncharted waters. Central banks must find our way back to homeland.

The word “sane” is a fascinating adjective. It has three entries in the Merriam-Webster dictionary. “Sane” means: first, “proceeding from a sound mind, i.e., rational”; second, “mentally sound, especially able to anticipate and appraise the effect of one's actions”; and third, “healthy in body”. Sane is therefore extraordinarily holistic. It is related to rationality *and* to *both* mental and physical health. Logically so. Healthy human beings are more likely to make rational decisions, and vice versa.

When human beings decide to disinvest from stocks, cash out, fly to safety, average down their positions, or put fresh cash into stocks, they drive the markets and make the



difference in the medium to long term, even in a world dominated by algorithm-driven orders sent almost at the speed of light.¹ Robotization has undoubtedly transformed financial markets since 2000, but the question that is regularly on everyone's lips has remarkably remained unchanged for decades: Do financial markets function properly? In 2020 were they “sane” despite the sanitary crisis?

The only absolute truth is that everything is relative

This sentence was written by Auguste Comte in 1817 and summarizes one of the most important “principles” that no one should ever forget when trying to judge the functioning of markets.

John Maynard Keynes was aware of this “law of relativity” when he introduced the concept of the beauty contest in Chapter 12 of *The General Theory of Employment, Interest and Money* (1936) to explain price fluctuations in equity markets: we price shares based on what we think everyone else thinks their value is, or what everybody else would predict the average assessment of value to be.

Of course, Keynes would have been too smart to conclude that the fundamental value of shares is irrelevant in their pricing. Valuation can be done by forecasting the levered free cash flow available to the firm’s shareholders and creditors, irrespective of how comparable firms perform. Sounder as it may be, this valuation method cannot be applied to a significant number of assets, the value of which are often determined by our “beliefs” and the value of stories that we tell each other (Damodaran, 2017). Gold or cryptos would be valueless if “beliefs” did not matter. It also explains why the valuation of a firm is often relative to its peers and based on market multiples.

So, judging markets in “absolute terms” only would be a mistake. The functioning of markets must also be evaluated by looking at investment alternatives, how we as individuals act, and how other global institutions perform.

Global institutions failed miserably

From a macro perspective, the first global institution which comes to our minds and which drives our lives *strictly speaking*, is the World Health Organization (WHO). Remember two key dates. On Monday March 30th, WHO executive director of health emergencies Mike Ryan said that "there is no specific evidence to suggest that the wearing of masks by the mass population has any potential benefit. In fact, there's some evidence to suggest the

¹ Algorithms are (still) designed by human beings. They learn from other algorithms but also from other human beings’ decisions to trade, trying to “anticipate and appraise the effect of one's actions”, i.e., trying to be “sane” in a sense.



opposite in the misuse of wearing a mask properly or fitting it properly". On Friday June 5th, WHO director-general Dr Tedros Ghebreyesus said that "in light of evolving evidence, the WHO advises that governments should encourage the general public to wear masks where there is widespread transmission and physical distancing is difficult, such as on public transport, in shops or in other confined or crowded environments". Astonishing to see how the world can change in two months' time.

Political institutions are global as well. In every country, political leaders give advice to their citizens, among them the most powerful one. During the coronavirus briefing on April 24th, President Trump floated the idea of 'an injection inside': "I see the disinfectant where it knocks it out in a minute. One minute! And is there a way we can do something, by an injection inside or almost a cleaning? Because you see it gets in the lungs and it does a tremendous number on the lungs, so it'd be interesting to check that. So, that you're going to have to use medical doctors with, but it sounds interesting to me."

Governments also make decisions based on experts who look for scientific evidence. Unfortunately, many of them reported to very different extents of accuracy. The pockets of confusion and misinformation that still remain today, has endangered public trust. Fake articles were even published within a couple of weeks in top peer-reviewed medical journals. The Surgisphere scandal has tarnished the reputation of *The Lancet*, one of the most highly regarded medical journals in the world. It then led scientists to test alternative journals, such as the *Asian Journal of Medicine and Health*, in which was published and then retracted a ludicrous article entitled "SARS-CoV-2 was Unexpectedly Deadlier than Push-scooters: Could Hydroxychloroquine be the Unique Solution?". Coauthors included Nemo Macron (Palais de l'Elysee), Sylvano Trottinetta (Collectif 'Laissons les Vendeurs de Trotinette Prescrire'), and Willard Oodendijk (Belgian Institute of Technology and Education, BITE), located in Couillet (of course). In the acknowledgements, the coauthors were even kind enough to thank Didier Raoult "with or without whom we would be nothing".

Scared retail investors often behave like scared consumers and citizens...

Naming a global institution which has functioned well since the lockdown has been challenging, to say the least, and from that macro perspective financial markets ought not to be ashamed of their reaction. Still, the question remains from a micro perspective: do retail investors as individuals behave more sanely than consumers and citizens do?

We have all observed consumers flocking to large supermarkets to buy everything that could help survive a Third World War, from oil, rice, flours, pulses, breakfast cereals, sugar, honey to paper toilets. Citizens were also scared to the point of wearing masks while walking alone, driving their bike in empty streets, or swallowing any conspiracy theory that

their best Facebook friend would have found on the Web the day before. Does the community of retail investors behave differently?

The picture that market critics like sharing the most is probably the one shown in Figure 1 where investors make decisions in panic mode. In a sense, they have a point: why would people behave differently when they invest, consume or vote?

Figure 1. How market critics see investors



Source: KAL (1969).

Since the works of Amos Tservsky and Daniel Kahneman (Nobel 2002), we know that investors mainly respond to two systems which explain their cognitive biases and heuristics quite well. System 1 is typically fast, automatic, and impulsive thinking; it would make 98% of our thinking and help us assess situations and deliver updates. System 2 is slow, rather conscious, aware, and considerate and helps us seek missing information and make decisions.

System 1 undoubtedly matters a lot in finance – it explains why momentum is so important – but it would be an abuse of language to characterize it as being irrational as market critics always do. When people use mirroring and mimicking, trying to anticipate others' action, they are not “mentally insane”. This is what the second entry for “sane” in the dictionary reminded us. In such circumstances, investors use a kind of universal signal, giving them a feeling of safety and security, sometimes to the detriment of others, like in a

bank run. System 1 should certainly not be viewed as irrational. In the not-so-distant past, it helped us survive to natural selection in the first place.

...but their System 2 is stronger when they combine time and diversification

There is nevertheless a way to resist to System 1: retail investors must diversify and lengthen the investment horizon as much as possible, especially when exuberance becomes the buzzword among pundits. In 2021, many pundits will certainly cite again Alan Greenspan’s famous speech at the American Enterprise Institute on December 5th, 1996, entitled “The Challenge of Central Banking in a Democratic Society”, during which he said:

“Clearly, sustained low inflation implies less uncertainty about the future, and lower risk premiums imply higher prices of stocks and other earning assets. We can see that in the inverse relationship exhibited by price/earnings ratios and the rate of inflation in the past. But how do we know when irrational exuberance has unduly escalated asset values, which then become subject to unexpected and prolonged contractions as they have in Japan over the past decade?”

On that day, the Nikkei 225 was down more than 3%. Should the American investors have taken it as a warning signal and closed their positions at that time, as many pundits suggest we should do today, succumbing to System 1? Certainly not.

Buying the S&P500 in December 1996 would have been a much better decision instead. As indicated in Table 1, this decision would have led to an *annualized* log return (ALR) equal to 22.15% until April 2000, equivalent to a Holding Period Return (HPR) of 109.26%. But April 2000 was just a couple of months before the collapse of the dot-com companies, as any market critic today would remind us immediately. What happens next?

Table 1. Investing in the S&P500.

	HPR	ALR
Dec 1996 – Apr 2000	109.25%	22.15%
Dec 1996 – March 2009	13.23%	1.08%
Dec 1996 – Jan 2021	676.95%	8.51%
Sep 2000 – March 2009	-46.25%	-7.30%
Sep 2000 – Jan 2021	265.05%	6.38%
June 2008 – March 2009	-48.37%	-88.14%
June 2008 – Jan 2021	250.67%	9.97%

Source: Refinitiv (S&PCOMP, Total returns). HPR is the holding period return computed from monthly simple total returns. ALR is the annualized log return using continuous compounding. Returns are computed before transaction and management fees. Author’ calculation.



In fact, the ability to keep one's nerve and not selling during the dotcom collapse would have been extremely rewarding thereafter. By resisting to panic, the total HPR would have *never* turned negative, with the lowest point reached in March 2009, equal to 13.23%, corresponding to an ALR of 1.08% (Table 1). So, even the 2007-2008 financial crisis would not have put the account in the red. Holding the long position even further, until end of December 2020, would have led to an ALR equal to 8.51% and a HPR of 676.95%. In other words, 100 USD invested in December 1996 would have grown to 776.95 USD in the end of December 2020.

The conclusion is that retail investors can minimize the impact of System 1 on their investment decisions if they lengthen their investment horizon and diversify enough to avoid bankruptcy, i.e., the “absorbing barrier” as we say in the jargon. Buying and holding a diversified portfolio for a sufficiently long period of time, as system 2 would invite most investors to do, is widely preferable.

Even if investors happen to buy at market tops, time is a very reliable friend. Assume an investor buys in September 2000, at the peak of the market, just before the crash of the dotcoms. The worst HPR would have been recorded in March 2009, down by 46.25%. But patience is a virtue when the portfolio is diversified: the ALR would have been *constantly* positive starting from December 2011, reaching a very attractive 6.38% today, corresponding to a HPR of 265.05%. When investors happen to buy at market tops, lengthen the investment horizon beyond 10 years is the least-worst solution.

Now market critics would argue that the situation would be much worse had the same investor bought in June 2008, just *before* the ‘2008 dirty summer’ and the collapse of Lehman Brothers in September. The worst HPR would have been recorded in March 2009 again, down by 48.37%. But patience would have made a huge difference again: the ALR would have been *constantly* positive starting from February 2012, reaching 9.97% at the time of writing, corresponding to a HPR equal to 250.67%.

So, retail investors would be much better off remaining indifferent to all the dismal predictions which flourish every year from pundits who often use fear as a very effective marketing tool to attract the attention of naïve investors. Economics is known as the “dismal science” and unsurprisingly some pundits like pretending they are the new Pythia of Delphi of the 21st century. This is the best personal strategy: when pundits want to make noise, they should ring the alarm bells when people are on the verge of panicking. In these circumstances, System 1 naturally drives people towards prophets who are believed to save lives by showing the way out... often to impoverishment.



The reaction of market professionals

Retail investors can use their System 2 more wisely than consumers when they diversify and lengthen their investment horizon. But in real life, market professionals make decisions regularly and cannot stay on the sidelines when market prices tumble, just asking their clients to “be patient and trust them”. Hence, a lot of market professionals try hard to take advantage of System 1 to predict “irrational exuberance”. Those who tried in the late 90’s failed miserably and were fired in 1997, 1998 or 1999. The same happened this year to many bearish hedge funds, including the highly respected London-based Lansdowne Partners. But how did market professionals react collectively to the lockdown decisions made across the globe?

The US exceptionalism

Let us focus on the most active US equity indices and disregard the last quarter of the year during which the discovery of vaccines was announced to the markets. In late September, i.e., around six months after the lockdown decisions, Table 2 clearly shows that the V-shaped rebound benefited all indices, with returns ranging from 24.64% to 46.95% (column 3).

Table 2. US Equity markets before the vaccines.

2020-09-26

Updated at 21:08:45

Percent Changes (%)

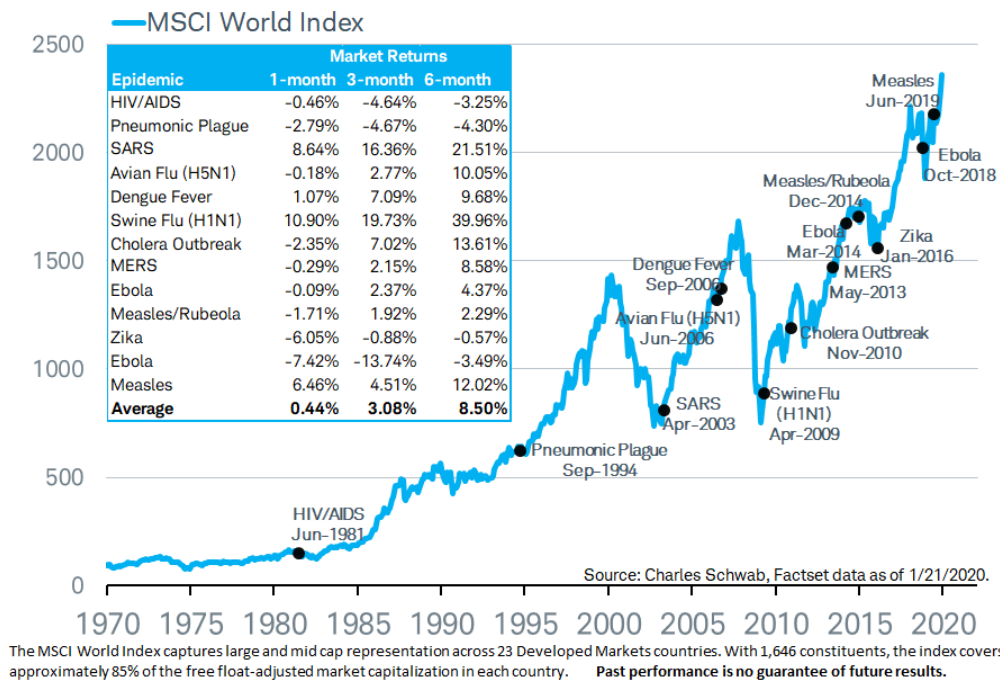
Index Name	Last	6M	MTD	YTD
Ws5000 TMI FC/d	33,816.19	32.61	-5.56	2.83
DJ INDU AVERG/d	27,173.96	25.59	-4.42	-4.78
S&P 100 INDEX/d	1,529.00	31.55	-6.71	6.02
NASDAQ 100/d	11,151.13	46.95	-7.92	27.69
SP 500	3,298.46	29.79	-5.77	2.09
S&P MIDCAP 400/d	1,817.27	27.71	-5.67	-11.91
SP 600	834.93	24.64	-7.11	-18.24
RUSSELL 3000 I/d	1,929.70	31.60	-5.64	1.98
RUSSELL 1000 I/d	1,836.41	31.68	-5.64	2.93
RUSSELL 2000 I/d	1,474.91	30.29	-5.57	-11.60

Source: Refinitiv. The date of this screenshot is 2020-09-26, 9. YTD = Year-To-Date. MTD = Year-To-Date. 6M= 6-months-To-Date. Last = last price.

Being patient was a rewarding decision as well in the past. Figure 2 plots the MSCI World Index and identifies 13 episodes of epidemics. The index ended up higher in 9 cases out of 13 six months after, with an average return of 8.50%. To my dismay, this was the only very poor benchmark I could use during a live conference given in February 2020 before the Covid-19 turned into a pandemic. I too boldly (and luckily) said: “only if markets are still significantly down in six months’ time, we might then face a bearish market more difficult to handle with”.

Figure 2. Epidemics and the MSCI World Index.

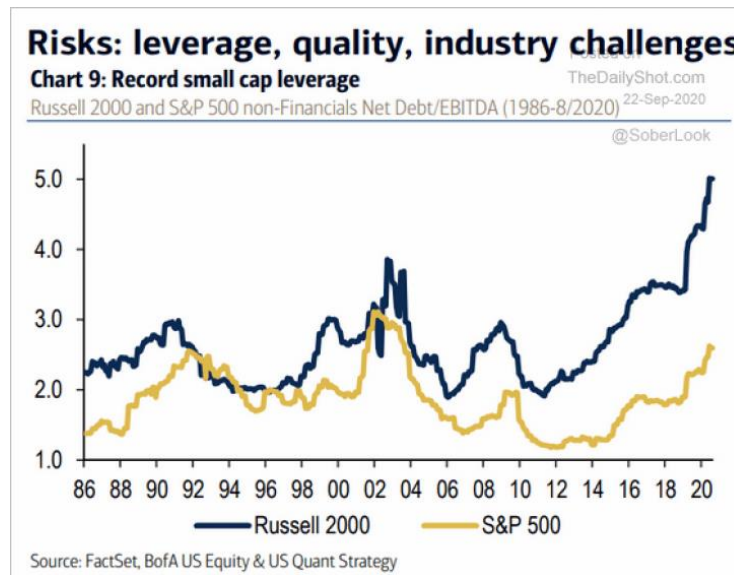
Immune: world epidemics and global stock market performance



Small, mid and large caps

There are two other interesting insights in Table 2. First, small- and mid-caps were hit more heavily and recovered more slowly than large caps. In late September (year to date, in column 5), the S&P400, S&P 600 and Russell 2000 were still down by 11.91%, 18.24% and 11.60% respectively, while the S&P 100 and 500 were up by 6.02% and 2.09%. This market reaction was pretty sane given the much higher leverage among small and mid-caps. Figure 3 shows the net-debt-to EBITDA ratio for the large firms included in the S&P500 and the smaller firms included in the Russell 2000 (excluding financials). Leverage was more than twice higher among smaller firms. The market was pricing the leverage effect: the drop in sales has more of an effect on firms that have to repay large debts.

Figure 3. Leverage among small, mid and large caps



New versus old

Second, the ‘new economy’ totally outclassed the ‘old economy’: the Nasdaq 100 was up by more than 27%, while the Dow Jones Industrial Average was down by more than 4%. This market reaction was again sane. Not only the tech industry would never catch the Covid-19 but it would also benefit from its spreading.

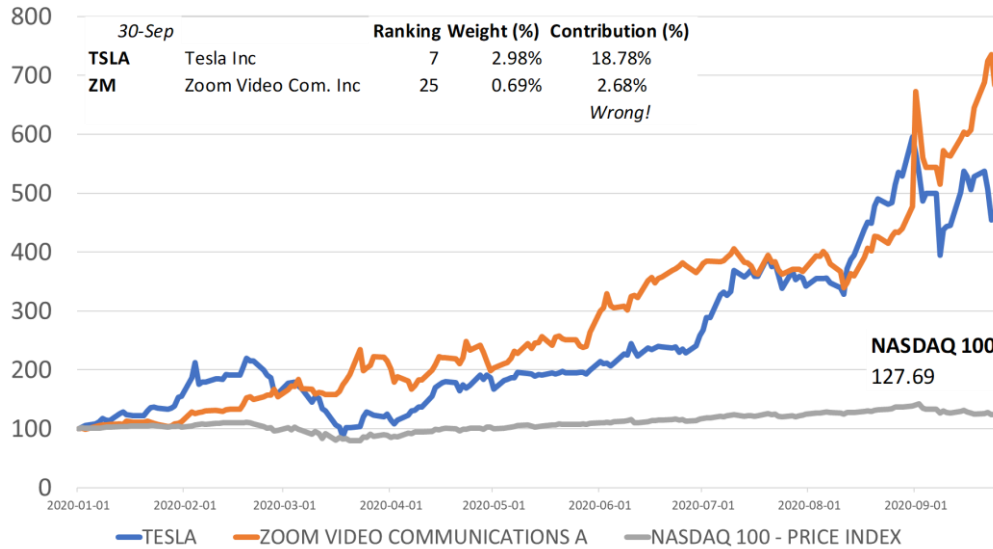
It was also incorrect to claim that the performance of the Nasdaq was distorted by a few stocks which admittedly recorded a very questionable, if not insane, performance, as reported in Figure 4. By the end of September 2020, Tesla stock price was multiplied by 7 and Zoom by 5.

Market critics, who often happen to be dumb commentators, immediately claimed that the Nasdaq was “overvalued” by more than 20% because of the contribution of Tesla and Zoom to the Nasdaq performance, i.e., 18.78% and 2.68% respectively. Their conclusion was in reality even more “insane” than the price jumps observed for these stocks.

Any Master student knows that using *current* market weights in retrospect over 9 months to recompute an index performance is doomed to give a very biased estimate, to say the least. In fact, the performance of Tesla or Zoom has not skewed the performance of tech stocks much. The exclusion from the Nasdaq index of these two “virus” stocks in an attempt to “purify” it, would have led to a performance of 22.51% instead of the observable 27.69%, as indicated in Figure 5. This is obtained by using their *historical*

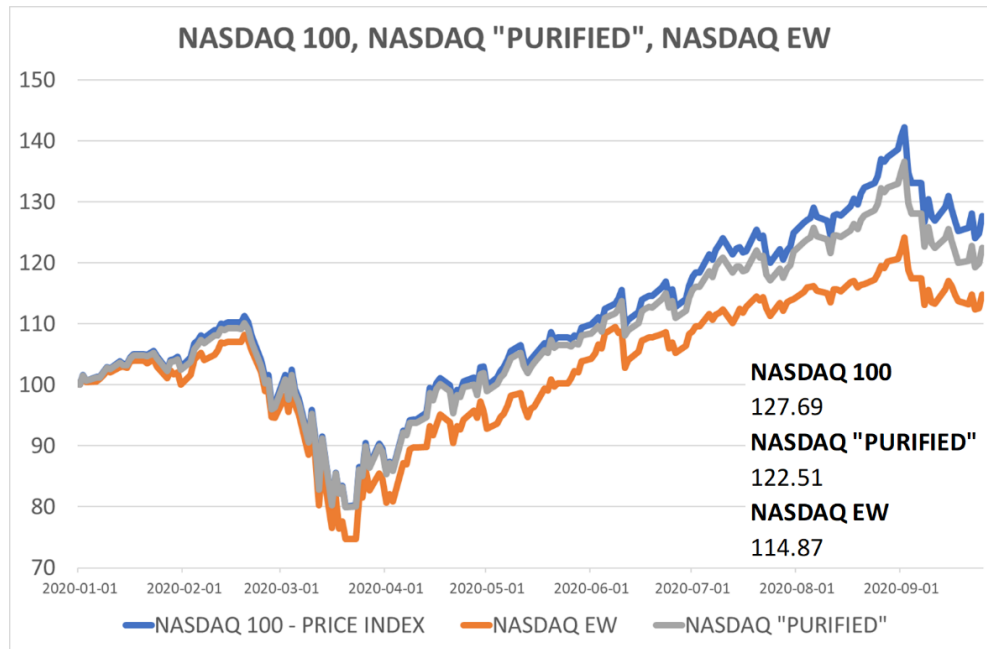
market weights and not the current ones. Even an “equally-weighted” Nasdaq index including all the stocks, would have been up by 14.87%. The performance of the tech industry was therefore not limited to a couple of very questionable valuations.

Figure 4. NASDAQ 100, TESLA and ZOOM



Source: Refinitiv. Author's calculation.

Figure 5. Recomputing the Performance of the NASDAQ 100



Source: Refinitiv. Author's calculation.



Market critics also blamed the FANGAM stocks (Facebook, Amazon, Netflix, Google-Alphabet, Apple, Microsoft) for driving the NASDAQ 100 to “irrational” levels. They just forgot that *all* these 6 stocks are also included in the S&P100 index which was up by 6.02% (only). Again, this clearly indicates that the outperformance of the tech sector was not restricted to the few winners “taking it all”.

The US equity market has nevertheless been undeniably driven up by these stocks. They represent today around 40% of the market capitalization of the Wilshire 5000 index. It was around 30% at the start of the year. Although this situation is dangerous from the point of view of diversification, these companies are still very “special”.

First, they benefit from a huge “insurance premium” for familiarity. Everyone knows these firms, most of us use them in their everyday lives like probably no other companies in the world. They offer a huge feeling of security, which is a very valuable intangible asset in times when the world sees death around the corner.

Second, they are cash machines and “cash is king” in finance. Think about the iPhone, the ad business for Facebook and Google, the soft and cloud business for Microsoft, the subscription business for Netflix, or the AWS cloud business for Amazon.

Third, their user base was just unthinkable 25 years ago: 2.7 billion users for Facebook and more than 1 billion for Microsoft, Google, and Apple.

Fourth, they sit on the most valuable virtual gold mines of the 21st century, from which personal data can be extracted. And still, “78% of people would bank with a tech firm like Amazon or Google”, according to Accenture (2017).

Of course, these stock valuations are very high and holding some of the stocks beyond what they already represent in broadly diversified indices has probably never been so “insane”, given the heightened risk of legal and political backlash they face. But humility is a virtue when it comes to judging how “irrational” the valuations of these stocks are. Remember Amazon 20 years ago after the collapse of the dotcom companies. In December 2001, its EBITDA was still negative and its stock price was 13.54, slashed by 76% in a single year. Today Amazon stock price is close to 2400 and its 2019 EBITDA was 32 billion.

Positive and Negative Discrimination across Sectors

The last column of Table 3 shows the performance from the start of the year to the end of September 2020 of all the key economic sectors in the US, as proxied by the S&P sectoral indices. The worst performing sectors were the energy, real estate and financial sectors. On the opposite side, the best performing sector was the information technology sector, followed by the consumer discretionary sector and consumer services, which both

benefited from the boost in online shopping (with Amazon and Home Depot being the two most important components in both indices).

There was again evidence of an incredible capacity by the market to separate the wheat from the chaff. The shock is indeed stronger in sectors exposed to a looming debt crisis: construction, real estate development, banking, durable goods (often bought on credit). On the other hand, the food industry, pharmaceutical companies and tech have been doing well.

Sectoral differences also explain the differences between countries. The United States benefited from its specialization in technology while the European indices suffered from a strong exposure to the manufacturing industry and construction.

Table 3. US sectoral markets.

2020-09-26
Updated at 21:05:48

Enter RICs		Sector Index Name	Last	Percent Changes (%)		
				6M	MTD	YTD
US	.15SP10	S&P ENERGY	226.95	7.10	-14.23	-50.16
US	.15SP15	S&P MATERIALS	405.95	39.95	-1.59	-0.88
US	.15SP20	S&P INDUSTRIALS	692.48	30.42	-2.03	-6.55
US	.15SP25	S&P CONSMR DISCR	1,058.78	51.51	-5.28	17.85
US	.15SP30	S&P CONSMR STPLS	682.37	18.29	-3.53	0.21
US	.15SP35	S&P HEALTH CARE	1,268.42	21.87	-4.64	1.34
US	.15SP40	S&P FINANCIAL	421.57	11.03	-6.22	-24.43
US	.15SP45	S&P INFO TECHNOL	2,013.83	44.20	-7.68	22.69
US	.15SP50	S&P C1500 CSrv	190.90	31.45	-7.98	5.55
US	.15SP55	S&P UTILITIES	336.62	4.17	-0.89	-10.85
US	.15SP60	S&P Real Estat	194.75	9.97	-4.62	-15.21

Source: Refinitiv. The date of this screenshot is 2020-09-26, 9. YTD = Year-To-Date. MTD = Year-To-Date. 6M= 6-months-To-Date. Last = last price.

The winning ticket

The rise of Amazon and the likes happened in the US in a generation time, and no astute observer of the current financial landscape, who likes historical books, should be surprised. Since the extraordinary rise of Amsterdam at the end of the 16th century, we (should) perfectly know that economic development is all the stronger when capital, labor, and technical progress abound and benefit from a temperate climate, a culture of risk, and the rule of law to avoid crony capitalism. In which country are all these economic growth drivers most easily combined nowadays?

The US will undoubtedly lose their leadership one day, as it happened to all dominant civilizations in the past, but this is unlikely to happen tomorrow. The recipe for their

immense economic success has indeed remained unchanged for centuries and is likely to remain unchanged for the centuries to come. Financial markets in 2020 have just made it even clearer than before.

The US and the World

For financial markets to rebound quickly in such a pandemic, there are indeed two indispensable ingredients: innovation and capital. Keeping the virus under control does not play any vital role in these circumstances, and this is worth dozens of % points as Table 4 clearly shows in the last column.

Table 4. US equity markets versus Europe before the vaccines.

	Enter RICs	Index Name	Last	6M	MTD	YTD
US	.NDX	NASDAQ 100/d	11,151.13	46.95	-7.92	27.69
US	.SP500	SP 500	3,298.46	29.79	-5.77	2.09
UK	.FTSE	FTSE 100 INDEX/d	5,842.67	6.03	-2.03	-22.54
CH	.SSMI	SMI PR/d	10,216.28	13.56	0.80	-3.77
SE	.OMXS30	OMXS30 INDEX	1,783.87	25.69	0.99	0.68
DK	.OMXC20	OMXC 20	1,335.42	30.97	1.07	17.58
FI	.OMXH25	OMXH25 INDEX	4,215.65	31.37	-2.16	-0.15
EU	.STOXX50E	ESTX 50 PR/d	3,137.06	14.97	-4.14	-16.24
EU	.FTEU3	FTSEurofirst 3/d	1,380.00	12.78	-2.79	-15.02
EU	.SPE350	SPE350 EUR	1,412.35	12.68	-2.96	-15.77
EU	.STOXX	STXE 600 PR/d	355.51	14.35	-3.00	-14.51
EU	.LCXP	STXE LRG 200 P/d	356.06	12.90	-2.84	-14.42
EU	.MCXP	STXE MID 200 P/d	426.80	18.19	-3.34	-16.05
EU	.SCXP	STXE SML 200 P/d	282.66	24.16	-4.12	-11.79
DE	.GDAXI	XETRA DAX PF/d	12,469.20	29.45	-3.68	-5.89
FR	.FCHI	CAC 40 INDEX/d	4,729.66	8.69	-4.40	-20.88
IT	.FTMIB	FTSE MIB/d	18,698.36	11.15	-4.76	-20.45
ES	.IBEX	IBEX 35 INDEX/d	6,628.30	-2.21	-4.90	-30.59
NL	.AEX	AEX-Index/d	540.91	16.34	-1.51	-10.53
BE	.BFX	BEL20/d	3,163.67	10.51	-5.07	-20.03
AT	.ATX	ATX-INDEX VIEN/d	2,083.02	4.27	-6.05	-34.64
PT	.PSI20	PSI 20 INDEX/d	3,995.60	1.34	-7.10	-23.37
GR	.ATF	FTSE ASE LAR C/d	1,473.58	11.18	-2.63	-35.88
RO	.BETI	BUCHAREST BETI	8,961.59	19.03	-0.40	-10.18
PL	.WIG	WIG/d	48,294.74	18.12	-6.46	-16.49

Source: Refinitiv. The date of this screenshot is 2020-09-26, 9. YTD = Year-To-Date. MTD = Year-To-Date. 6M= 6-months-To-Date. Last = last price.

The only indices in Europe which closed the month of September in positive territory were those of the Nordic countries (OMXS 30, OMXC 20, and OMXH 25) where the “Welfare State” has been less dysfunctional than in countries such as France or Belgium, to name a few.

Table 5 compares the performance of the US equity markets (through the NASDAQ 100 and the S&P 500) to worldwide indices across all continents. From the start of the year to the end of September 2020, countries which emerged unscathed were China (SSE Composite), South Korea (KOSPI 200), and New Zealand (S&P/NZ 50). None of these countries combines the above-cited economic drivers as well as the US, but they have been all able to control the spreading of the virus. This is worth dozens of % points as well.

Table 5. US equity markets versus the Rest of the World (excl. Europe).

		Updated at 10:31:00		Percent Changes (%)		
<i>Enter RICs</i>	Sector Index Name	Last	6M	MTD	YTD	
US	.NDX	NASDAQ 100/d	11,151.13	46.95	-7.92	27.69
US	.SP500	SP 500	3,298.46	29.79	-5.77	2.09
CA	.GSPTSE	S&P/TSX COMP I/d	16,065.35	26.62	-2.72	-5.85
MX	.MXX	IPC/d	36,583.71	8.24	-0.70	-15.98
BR	.BVSP	BVSP BOVESPA I/d	96,999.38	32.10	-2.38	-16.12
AR	.MERV	S&P MERVAL/d	42,042.45	72.42	-10.23	0.89
CN	.SSEC	SSE COMPOSITE/d	3,219.42	16.13	-5.19	5.55
HK	.HSI	HANG SENG INDE/d	23,235.42	-1.06	-7.71	-17.57
JP	.TOPX	TOPIX INDEX	1,634.23	11.97	0.99	-5.06
JP	.TOPXC	TOPIX Core30	746.25	10.32	-0.56	-6.15
JP	.JPXNK400	JPX NK400	14,684.76	12.46	0.50	-4.50
KR	.KS200	KOSPI 200 INDEX	303.57	29.85	-1.16	3.34
IN	.BSESN	S&P SENSEX/d	37,388.66	25.40	-3.21	-9.37
AU	.AXJO	S&P/ASX 200	5,964.90	23.18	-1.58	-10.76
NZ	.NZ50	S&P/NZX 50 GR/d	11,797.08	23.44	-1.18	2.66
SA	.JTOPI	TOP40 -TRADEAB/d	49,547.74	24.63	-3.28	-2.50
NG	.NGSEINDEX	NSE ALL SHARE/d	26,319.47	23.39	3.92	-1.95
TN	.TUNINDEX20	TUNINDEX 20	2,951.50	6.22	0.32	-5.66
MA	.MASI	CASA ALL SHARE/d	9,952.63	2.33	-1.80	-18.23
SA	.TASI	TDW MAIN IDX/d	8,275.56	29.78	4.22	-1.35

Source: Refinitiv. The date of this screenshot is 2020-09-26, 9. YTD = Year-To-Date. MTD = Year-To-Date. 6M= 6-months-To-Date. Last = last price.

Time is relative value

Market critics are shocked by current company valuations globally, but they miss a point: time is not value. Time is relative value.

The basic principles of company valuation make it clear. Shareholders own companies and the fundamental level of the stock market is given by the sum of all future profits of listed companies, adjusted by the risk-free rate (that of 10 or 20-year treasury bonds) and the risk premium which reflects risk aversion.

When a shock like the Covid-19 crisis hits the market, investors sell risky assets to cash out or fly to safety by investing in bonds. In other words, the stock market tumbles because the risk premium skyrockets. But when the *level* of rates is very low, the *most distant, long-term* future profits weigh *more heavily* on stock prices. Vice versa, the *least distant, short-term* future profits, expected over the next couple of years, matter less. Therefore, shocks which are expected to last 1 or 2 years are less destabilizing that it could have been with interest rates closer to 10%. In a world of low interest rates, the market gives more weight to long-term profits. Even a strong and lasting crisis weighs much less heavily in the face of the infinite future.

Using neutral expectations about key input parameters and assuming a long-term growth rate equal to 1.75% (slightly higher than the current 30-year T-bond yield to maturity in the US), the current level of the S&P500 on the 1st of January 2021 can be theoretically justified, as indicated in Figure 6.

Figure 6. Justifying current market valuation of the S&P500.

Level of the index =						3756.07
Current dividend and buyback yield =						3.80%
Expected growth rate in market earnings for next 5 years =						4.60%
Current long term bond rate =						0.92%
Risk premium =						5.23%
Expected growth rate in the long term =						1.75%
Intrinsic Value Estimate						
		1	2	3	4	5
Expected Dividends =	\$	149.30	\$ 156.16	\$ 163.35	\$ 170.86	\$ 178.72
Expected Terminal Value =						\$ 4,140.90
Present Value =	\$	140.65	\$ 138.60	\$ 136.58	\$ 134.59	\$ 3,205.66
Intrinsic Value of Index =	\$	3,756.08				
Under- or Overvaluation						0.00%

Source: Refinitiv and Aswath Damodaran. Author's calculation.



Now, most financial analysts predict a two-year recession and expect a rapid recovery by the end of 2022, with profits going back to the level anticipated in early 2020. But some of them anticipate a permanent scar of 5% on profits. The theoretical estimation of this effect would be a fall in the S&P500 by 5.3% on the current market value, all else equal. This is digestible to say the least. Based on this very simple theoretical analysis, there is *currently* no obvious sign of “irrationality” at the market level at least, even in the “very pricey” US equity market.

From the CAPE to the ECAPEY and the BEYR

There are quite a few useful metrics to determine how “pricey” is a market, the most famous among them being the 10 year cyclically adjusted price-earnings ratio (CAPE).

Robert Shiller (2013 ‘Nobel’) used the CAPE in his 2000 book, *Irrational Exuberance*, to correctly conclude that the US market was in System 1 mode in the late 90’s.² From January 1999 to September 2000, the CAPE was constantly above 40, with an all-time high at 44.20 in December 1999.

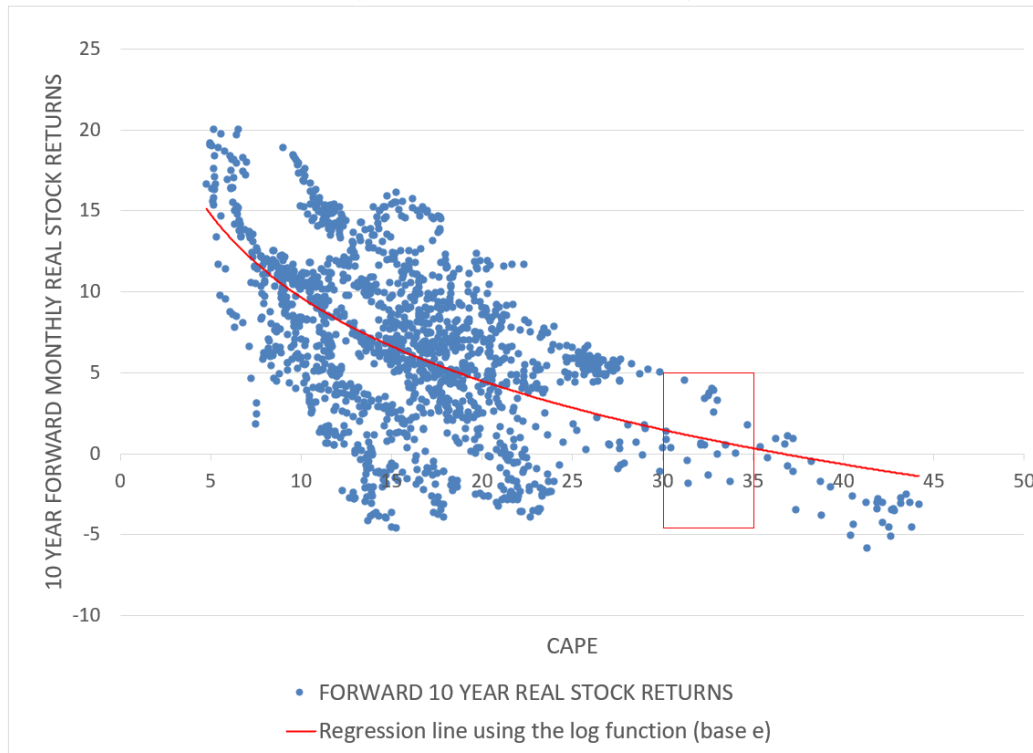
Although the 2020 Q4 real earnings for the S&P500 are not yet available, we can comfortably say that the CAPE of the S&P500 is currently close to 33.5. This is historically very high since it corresponds to a 97.8 % historical percentile, meaning that the CAPE has been above 33.5 in only 2 months over 100 since January 1881. This hold true even when the “total return” version of the CAPE is used instead.³

Figure 7 plots the 10 year forward monthly stock returns against the CAPE. We notice the nice fit using a logarithmic interpolation with a R-square above 30%. All the months during which the CAPE was between 30 and 35 are included in the red rectangle. This sample includes 9 months in a row, from June 1997 to February 1998, as well as 6 months in a row from March 2001 to August 2001. For the most pessimistic analysts, it also includes the months of August and September 1929. The average and median annualized returns that we obtain by zooming on this 30-35 CAPE range, are respectively equal to 15.44% and 7.36%.

² Robert Shiller was reportedly Greenspan's source for the term “irrational exuberance” that the former Fed chairman used in his 1996 talk.

³ The unadjusted PE ratio in the US / EU / Emerging markets is 22 / 18 / 15 against a 30-year average of 15.5 / 13.8 / 13 (equivalent to a 42% / 30% / 15% premium).

**Figure 7. CAPE versus forward 10 year monthly real stock returns
(from Jan 1881 to Dec 2010).**



Source: Robert Shiller (<http://www.econ.yale.edu/~shiller/data.htm>). Author's calculation.

There is another metric on which Robert Shiller has put more emphasis lately to nuance the claims that markets were in “irrational mode” (Auteurs, 2020).⁴ This is the so-called “Excess CAPE Yield” (ECAPEY), which is just the difference between the CAPE and the 10-year T-bond yield to maturity in real terms. The higher the ECAPEY, the more attractive stocks *relative* to govy bonds. This metric has been well known for years by scholars such as Giot and Petitjean (2007, 2009). Although this metric does not show sufficient predictability from a statistical perspective, it has been proven to be a very useful valuation metric in many cases in the past to estimate the *relative* attractiveness of stocks.

Currently, the ECAPEY is equal to 3.81% which corresponds to a 53.6% historical percentile, i.e., the ECAPEY has been below 3.81% in 54 months out of 100 since January 1881. In other words, stocks happened to be more attractive than they currently are (relative to

⁴ Irrationality is in the eye of the beholder. I instead prefer using “System 1 mode”.

bonds) in 46% of the cases. This indicates that US stock markets do *not* currently look particularly expensive *with respect to* govy bonds.

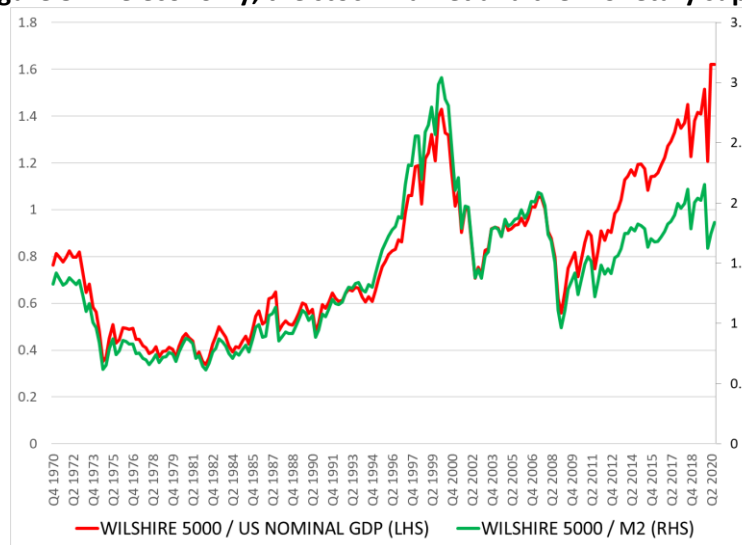
There is an alternative to the ECAPEY. This the Bond-Equity Yield Ratio (BEYR). This is the ratio, and not the difference, between the 10-year T-bond yield to maturity in real terms and the CAPE. The higher the BEYR, the more attractive govy bonds relative to stocks. Currently, the BEYR value is negative and its corresponding historical percentile is 17%. This indicates that bonds happened to be more attractive than they currently are (relative to stocks) in 83% of the cases. The use of the BEYR points even more clearly to the relative attractiveness of stocks in the US.

Torrents of money

The picture is nevertheless not so rosy as these basic metrics would indicate. The only reason why markets have survived this health crisis and rebounded so quickly is because central banks over the globe have simultaneously injected torrents of money in the financial system and been followed by very expansionary fiscal policies. There has never been in the past such a synchronous and rapid conjunction of monetary and fiscal policies across all continents, leading to a massive rise in the monetary supply.

In the late 1990s, Warren Buffet alerted investors to the high probability of a sharp market correction by relying on a simple ratio, i.e., the ratio between the Wilshire 5000 total market capitalization and the nominal GDP. As indicated in red in Figure 8, he was fully right since the ratio reached its all-time high just before the 2000 dotcom market correction.

Figure 8. The economy, the stock market and the monetary supply.

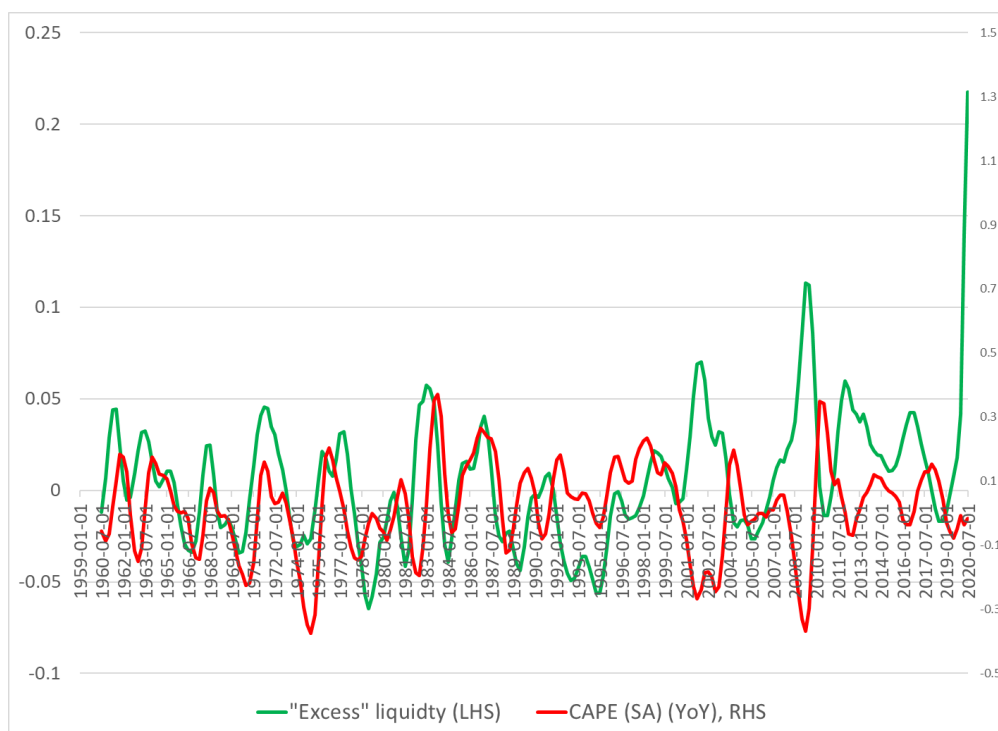


Source: Refinitiv and St. Louis Federal Reserve.

Since the 2008 financial crisis, there has been nevertheless an incredible disconnect between the “Buffet” ratio and its “monetary” alternative, i.e., the ratio between the Wilshire 5000 total market capitalization and the M2 monetary supply (in green in Figure 8). Had there been no “fast and furious” increase in the monetary supply, markets would have arguably corrected as much as they did the years 2000-2001. Unfortunately, Warren Buffet had probably “his” ratio too much in mind when making decisions this year and it did not turn out very well. The Berkshire Hathaway stock price was up by 2% only in 2020, lagging the S&P500 by a significant margin.

Figure 9 clearly indicates the sharp *and* quick rise in “excess liquidity” in green, as measured by the difference between the year-on-year growth rate of the quarterly monetary supply and the year-on-year growth rate of quarterly nominal GDP (smoothed over 3 months). The contrast is vivid when it is plotted against the year-on-year rise in quarterly CAPE (smoothed over 3 months). The reaction of the Federal reserve in 2008-2009 looks miserable in comparison to what happened this year.

Figure 9. Excess liquidity and CAPE.



Source: Refinitiv and St. Louis Federal Reserve.



Conclusion

In all the figures and tables above, there was no obvious sign of “market irrationality”. The overall reaction of markets to this unprecedented explosion of “liquidity” was rational, which does not mean all valuations are sane. “(Quasi) cash is king” in finance and it would have been a tremendous error of judgment to pretend it does not weigh on market valuations, at least through its direct impact on interest rates and asset risk premia.

Market critics like considering that markets are driven by System 1 only, which would explain why “market irrationality” is so prevalent, but system 1 is not irrational. The stock exchange is not a global casino where the wealthiest players would know the martingale and abuse the naïve investors by exacerbating fear and greed in the marketplace. If it were, it would not be so hard for professionals and hedge funds to beat the market, once luck, transaction costs and risk are correctly accounted for (Wigglesworth, 2020).

This has led Aswath Damodaran (Stern Business School, NYU) to say on August 20, 2020 during a talk online: « I describe this crisis as the most orderly crisis I have seen in my lifetime because the damage and the reward seem to make sense ». I cannot agree more, and I have never seen in my lifetime such a sharp contrast between the response of financial markets to this crisis and the blatant failure of the “Welfare State” to deal with it. There is nevertheless a big caveat to all this. Central banks have undoubtedly doped financial markets and the rise in the monetary supply since 2010 has been so incredible that no single expert in the world, who is sane in body and mind, would deny that markets are in uncharted waters, in particular the bond market in Europe which has become the least-worst textbook example of a financial monopsony market where a single buyer calls the shots.

Central banks have made the sun shine over the last decade. Without the Fed, God knows what the banking system would have become in the aftermath of the Lehman Brothers collapse; without the ECB, God knows what the eurozone would have turned into after the 2010 balance-of-payments crisis.

For not making it rain like cats and dogs in the decade to come, central banks must find our way back to homeland. This is not the duty of financial markets... but theirs, again.



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