Introducing the 3D challenge – Debt, Demographics and Disruption (with a US case study)

1. **Introduction**

As a response to the Financial Crisis of 2008, central banks have been running persistent loose monetary policies (NIRP and aggressive asset purchase programs) in order to generate some growth and inflation. Even though the measures chosen by policymakers mainly came from the burst in the housing market (US and Europe), developed economies have also been cornered with another long-term big issue: the 3D problem – Debt, Disruption and Demographics. Demographics reveal a dramatic aging of the developed world's population ('Baby Boom effect'), which has been playing a role in the desire of consumers to save more than actually spend. In addition, the long-term solvency of public and private plans has also been a growing concerns across the developed nations, adding pressure on current workers to increase their amount of savings based on a shift in expectations of higher taxes to sustain the secular change in demographics. The effect of an increase in savings have been one of the main factors of a decrease in inflation expectations across the world in addition to a sluggish growth, forcing policymakers to maintain a loose monetary policy, cutting rates to even negative territory and diversifying the asset purchase programs (corporate bonds, ETF and Real estate). The slowdown of inflation, and even deflation for some countries, is an issue for developed nations as it increases the country's debt in real terms, putting the country under pressure and questioning its long run sustainability.

Even though increasing volatility in the exchange rates as a response to monetary policy shocks has been the subject of a body of empirical studies since the early 1990s, it is cleared that the aggressive stimulus announced by policymakers have had a large impact on each of the country's currency (i.e. Japanese Yen and Abenomics in December 2012, the Euro and Draghi's QE announcement in May 2014). This effect has pressured the *rest* of the central banks in the world to act identically (top 50 central banks around the world have seen a total of 700 interest rate cuts since the collapse of Lehman Brothers In September) if the officials didn't want to experience an appreciation of the exchange rate (See article on the ECB's impacts on European Central Banks' Economies). As you can see it in Figure 1, the major central banks (Fed, ECB, BoJ and PBoC) have accumulated $10 trillion of assets in their balance sheets since early 2008, for a combined total of $18.5 trillion as of May 2017. Moreover, the balance sheets of the ECB ($4.6tr), the BoJ ($4.5tr) and the PBoC ($5tr) are all bigger than the Fed's one for the first time in history.

Figure 1. Total Asset of Major Central Banks (Source: Yardeni Research)
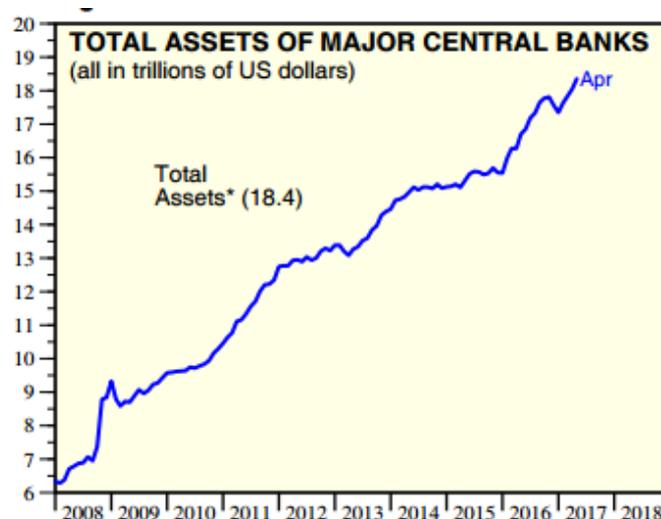
One specific country where the 3D Problem has cornered the government into a difficult situation over the past 20 years is [of course] Japan, but I thought today we could focus on a different economy as Japan has been the main topic of many of my posts (see here for the *global* picture). Hence, I thought we could cover the US as a *case study* of the 3D problem.

2. The US Case Study

A. Reviewing the US Demographics

We heard from many studies that over the next twenty years, roughly 70 million of American 'Baby Boomers' will retire, or 10,000 people every day. That is a significant trend with profound economic consequences, as it is known that retirees contribute much less to the economy than young workers. More importantly, a third of them (23m) have zero retirement savings and all they hold is equity in a house, which they would probably have to sell in order to finance their *retirement*.

On the top of that, only 2,500 millenniums are entering in the workforce, which puts the US government under pressure as somebody will have to *fill* the gap. As investor Stanley Druckenmiller pointed out at the DealBook Conference in 2015, government outlays paid to individuals have surged from 28% in the late 1960s to 68% today. As a consequence, the senior poverty rate has gone from 30 to 9 percent; but on the contrary, the child poverty rate (poverty is defined as an annual income below $25,000 for an average family of four) went up from 21 to 23 percent during that same period, which put the US on the 34 position (based on the child poverty rate) compared to the other developed nations. The US government spends $8,000 per capita on children, while $44,000 go to the seniors. And that is not the end of the problem, as the over-65 population is going to grow over a 100% over the next three decades, while the working 18-64 population is going to grow by 17 percent [only]. If we assume that every retiree was going to get his social security payment and Medicare payment and take the present value of the future government's liabilities, the federal debt would be over 200 trillion US dollars (instead of $20 trillion as it is reported), assuming the interest rate will be at 4 percent (and not higher).

B. US Federal and Household debt

As we showed in our study on corporate defaults rates (here), the total US credit debt – consumer, corporate and government – was of 64.1 trillion USD as of Q1 2016 (in which there is roughly 40.5 trillions of debt and the rest of loans), up almost 10tr USD since Q4 2008. And the three main securities of the 40-billion-dollar bond market are the Treasuries (35%), the Mortgage related debt (23%) and the corporate debt (22%).

1. US Federal Debt and Budget

The total US Federal debt stands at [almost] 20 trillion US Dollars according to the US debt clock website, and falls into two broad categories: Intra-governmental Holdings (5.55tr USD) and Debt held by the Public (14.4tr USD, according to FRED). The intra-governmental debt holdings represent balances of Treasury securities held by 230 federal agencies, such as the Social Security Trust Fund, Military Retirement and Health Care, and Civil Service Retirement and Disability Trust funds.

The *marketable* Treasuries are the ones held by the Mutual and Pensions funds, Federal Reserves and Foreign countries, and are split between T-bills, notes, bonds and TIPS.

Over the past decades, the US has mainly been a debtor nation, running large fiscal deficits on the back of potential domestic and foreign buyers of the riskless US debt. In Figure 3, we can see the President's proposed total spending and revenue for the Fiscal Year 2016, which was submitted [by Obama to Congress] on February 2nd of that year.

As a reminder, the spending budget is composed of the mandatory (i.e. Social Security, Medicare…) and discretionary spending, which accounted for 2.63tr and 1.15tr US Dollars respectively. The rest, $283bn (equivalent of 7% of total spending), is the interest paid on the debt, which corresponds for roughly 1.5 percent of the country's GDP. On the other hand, the proposed revenue collected mostly from individual income, payroll and corporate taxes was of $3.5tr, creating an expected $600bn deficit for FY2016 (eventually revised at $587bn in October last year).

Figure 3. President Proposed Budget for FY2016 (Source: CBO)
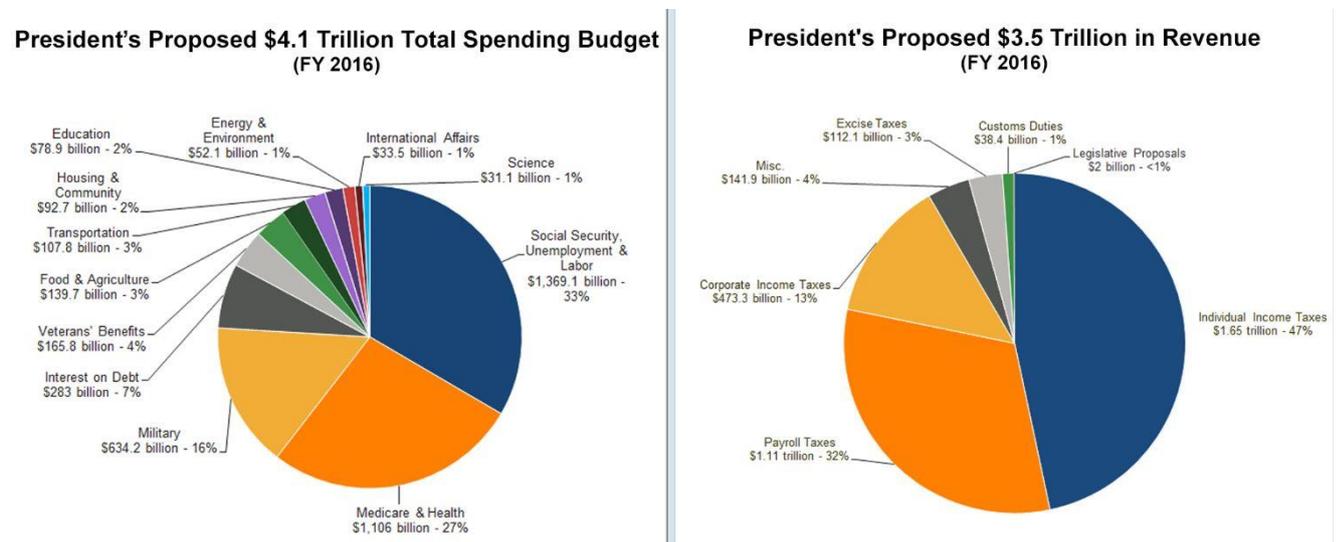
The question now is 'For how long can the US continue to print fiscal deficits?'. An important report to look at is the Budget and Economic Outlook, published by the Congressional Budget Office and updated every January. If we look at Table 1, we can see that mandatory spending is going to grow between 5 and 10 percent per year over the next decade (2017 – 2027), and the US is potentially going to cumulate a total deficit of $9.4tr as the revenues are not going to match the exponential growth in spending.

Table 1. CBO's Baseline Budget Projections, by Category (Source: CBO, January 2017)

	Actual, 2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	Total 2018-2022	Total 2018-2027
						In Billions of Dollars								
Revenues														
Individual income taxes	1,546	1,651	1,781	1,871	1,957	2,052	2,148	2,249	2,355	2,470	2,590	2,714	9,809	22,187
Payroll taxes	1,115	1,150	1,190	1,230	1,265	1,312	1,364	1,417	1,468	1,525	1,583	1,640	6,361	13,993
Corporate income taxes	300	320	340	352	382	377	381	385	396	408	422	439	1,832	3,882
Other	306	283	293	280	274	278	284	295	308	322	336	347	1,408	3,016
Total	3,267	3,404	3,604	3,733	3,878	4,019	4,176	4,346	4,527	4,724	4,931	5,140	19,410	43,078
On-budget	2,457	2,566	2,734	2,834	2,951	3,060	3,183	3,318	3,462	3,622	3,789	3,958	14,760	32,911
Off-budget[a]	810	838	870	899	928	959	993	1,028	1,064	1,102	1,142	1,182	4,649	10,168
Outlays														
Mandatory	2,429	2,484	2,585	2,764	2,925	3,097	3,329	3,455	3,583	3,827	4,076	4,305	14,700	33,946
Discretionary	1,184	1,209	1,210	1,238	1,257	1,284	1,315	1,340	1,367	1,405	1,439	1,475	6,304	13,330
Net interest	241	270	295	332	380	435	492	550	604	657	714	768	1,934	5,228
Total	3,854	3,963	4,091	4,334	4,562	4,816	5,135	5,346	5,554	5,890	6,228	6,548	22,938	52,504
On-budget	3,078	3,157	3,227	3,409	3,575	3,761	4,008	4,143	4,271	4,524	4,774	5,000	17,980	40,692
Off-budget[a]	776	806	864	925	987	1,055	1,127	1,204	1,283	1,366	1,454	1,548	4,958	11,812
Deficit (-) or Surplus	-587	-559	-487	-601	-684	-797	-959	-1,000	-1,027	-1,165	-1,297	-1,408	-3,528	-9,426
On-budget	-621	-591	-494	-575	-624	-701	-826	-825	-809	-902	-985	-1,042	-3,219	-7,781
Off-budget[a]	34	32	6	-26	-60	-96	-134	-176	-218	-264	-312	-366	-309	-1,645

2. Household debt

According to the latest New York's Fed report, total US household debt reached a record high of $12.73tr as of March 31, 2017. It is up 14 percent since the second quarter of 2013, which was when the post-2008-crisis deleveraging *ended*, and $50bn above its Q3 2008 peak. The major contributor of that 4-year increase is inevitably the rise in mortgages, which accounted for 56% ($258bn) of the annual change ($473bn), followed by auto and student loan debt (Table 2).

Table 2. Household debt (Source: NY Fed)

Household Debt and Credit Developments as of Q1 2017

CATEGORY	QUARTERLY CHANGE*	ANNUAL CHANGE**	TOTAL AS OF Q1 2017
MORTGAGE DEBT	(+) $147 BILLION	(+) $258 BILLION	$8.63 TRILLION
HOME EQUITY LINE OF CREDIT	(-) $17 BILLION	(-) $29 BILLION	$456 BILLION
STUDENT LOAN DEBT	(+) $34 BILLION	(+) $83 BILLION	$1.34 TRILLION
AUTO LOAN DEBT	(+) $10 BILLION	(+) $96 BILLION	$1.17 TRILLION
CREDIT CARD DEBT	(-) $15 BILLION	(+) $52 BILLION	$764 BILLION
TOTAL DEBT	(+) $149 BILLION	(+) $473 BILLION	$12.73 TRILLION

An interesting chart to look at in this report is the 90+ days delinquent loans by type (see Figure 4). As you can see it below, a rise in mortgage delinquencies in 2009 was *naturally* tracked by a rise in credit card, auto and home equity revolving (loan in which the borrower uses the equity of his house as collateral) delinquencies. Then, when the panic was *halted* through a series of governmental (TARP) and central bank interventions, the mortgage delinquency rate started to decrease, bringing down the other rates with him (except for student loans).

Figure 4. Percent of Balance 90+ Days Delinquent by Loan Type (Source: NY Fed)

Percent of Balance 90+ Days Delinquent by Loan Type
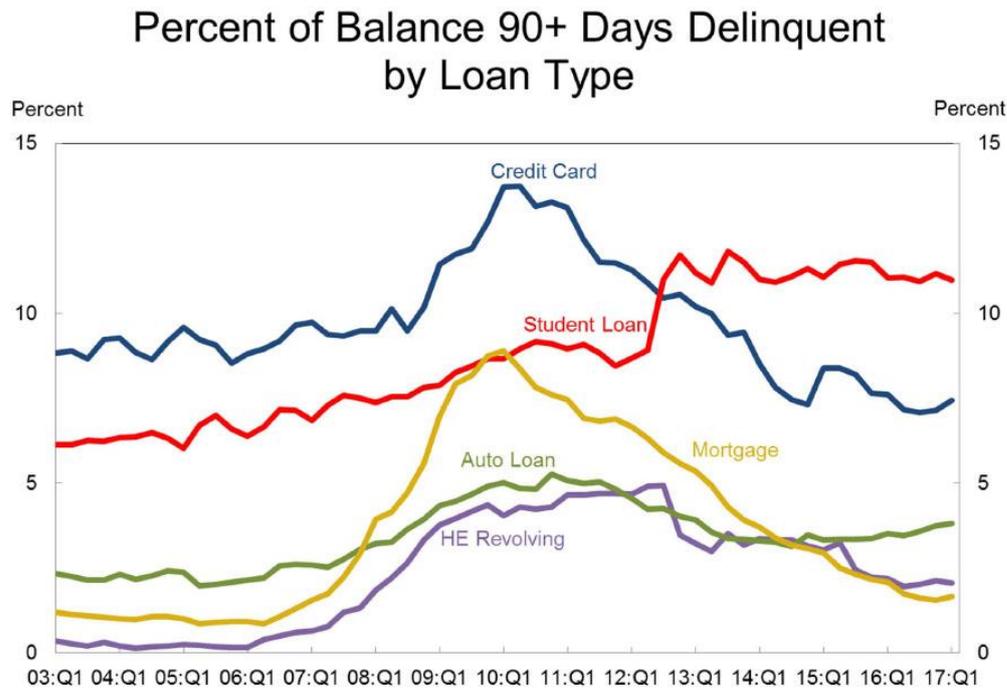
Source: New York Fed Consumer Credit Panel/Equifax

However, what we observe today is a relatively low mortgage delinquency rate (1.7%), while the student (11%) and auto loan (3.8%) delinquency rate has been going north. We can also see a recent *spike* in the credit card delinquency rate, which now stands at 7.5% of the total $764bn. In my opinion, the purchase of financial securities (Treasuries and agency MBS) by the Fed has pushed asset prices higher in general, and particularly the housing market. The situation we have today is an artificially low mortgage delinquency rate through the easing measure employed by all central banks across the globe, while an uncertain future for the millenniums. The increase in the student loan can be explained by either the lack of jobs (due to disruption) or a poor salary relative to the university tuition fees.

You certainly have come across the bartenders and waiters versus manufacturing workers chart (See Figure 5), which shows basically in which industry jobs have been growing since the Financial Crisis. According to the Bureau of Labor Statistics, the US has gained 1.7 million waiters and bartenders and lost 1.5 million manufacturing workers between December 2007 and December 2016. Hence, a low employment rate (like today at 4.3% in the US) doesn't necessarily mean that the economy is improving and that delinquencies on credit card, auto and student loans will go down automatically.

Figure 5. Waiter/Bartender vs. Manufacturing Jobs (Source: ZeroHedge)

Source: BLS, Zero Hedge
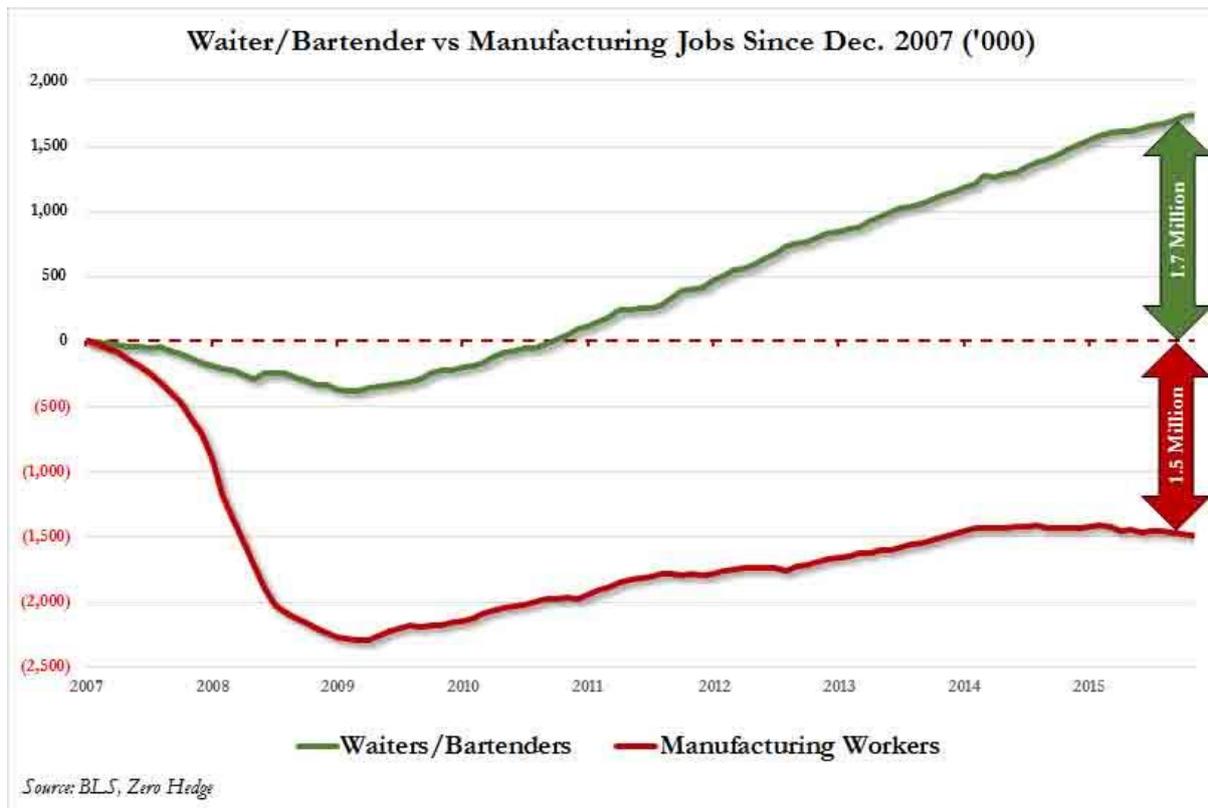
In this last part of the case study, we will talk about the development in disruptive technologies and its potential negative impact on the future of the working population.

C. Disruption

We know from history that slowing growth is most often attributed to leverage (i.e. debt) and demographics. However, the development in disruptive technologies can potentially accelerate the process, pushing the US (and other developed economies such as Japan or Europe) to a long and *ugly* deflationary deleveraging.

1. The Goods & Service sector crisis

From a market's perspective, we have seen that the goods & service sector has been subject to a crisis over the past few years. In the US, we are talking about a Retail store crisis, with big US department store sales experiencing massive declines (i.e. Macy's, JC Penney, Nordstrom…), which can be seen through the constantly declining market capitalisation of those companies. As you can see in Figure 6, the S&P Composite 1500 Department Stores is currently trading at 137.4, down from 300+ in early 2015.

Figure 6. S&P Composite 1500 Department Stores Index (Source: Google Finance)

As a response to a declining share price, retailers are constantly updating the number of closing store. (on the upside). Here is a quick list of major retailers that are closing stores in 2017:

- Ascena Retail Group – 268 stores
- Gymboree – 450 stores
- Sears and Kmart – 66 additional stores
- J.C. Penney – 138 stores
- Macy's – 68 stores
- Bebe stores – 180 stores
- Abercrombie & Fitch – 60 stores
- Guess – 60 stores
- Crocs – 160 stores
- The Limited – 250 stores
- Wet Seal – 171 stores
- American Apparel – 110 stores
- BCBG – 120 stores
- Michael Kors – 100 to 125 stores
- Payless ShoeSource – 512 stores
- Rue21 – 400 stores
- RadioShack – 1,000 stores
- Hhgregg – 220 stores
- GameStop – 150+ stores
- Staples - 70 stores
- CVS – 70 stores
- Family Christian – 240 stores

2. Fast foods reactions: Drones and Robots

In the *fast food sector,* the creation of 'Flippy', the burger-flipping robot will also create job losses in a near future. At first, fast food restaurants started to install self-ordering kiosks in order to counter higher labour costs, in addition to increasing efficiency and operational mistakes. In the meantime, if the *kitchen* is also replaced by robots, I don't know how many people will be working in MacDonald's in the future.

More recently, we all heard that Domino's will soon begin using robots to deliver pizzas instead of the customary delivery man or woman. Not to mention that it also announced last year that it was launching a pizza-making robot that each costumer will be able to track with a live camera during the preparation. Therefore, those announcements clearly show that Domino's is trying to reduce its number of [human] employees as much as possible. As a response, the stock price went up dramatically over the past couple of years. More importantly, Domino's share price growth has outpaced the most successful tech companies in the world since 2010. To give you an idea, the stock hit a low of $3.03 per share in November 2009 (21st) and is now trading at $207.27, which corresponds to an outstanding 6741% return.

3. From Nifty Fifty to Nifty Five: FAAMG stocks

Another story that has been making the headlines recently is the one on the FAAMG stocks: Facebook, Amazon, Apple, Microsoft and Alphabet. As Goldman reported, this group of five stocks have been the key driver of both the SPX and NDX returns year-to-date. According to their study, the group of 5 accounted for 55 percent of the NASDAQ's YTD gain, with a 6-month realized volatility below that of an average stock in the SP500. Without the influence of those tech stocks, which could also be called 'growth stocks', the market would have gone nowhere.

An interesting point that those growth-oriented stocks have in common is the significantly low number of employees. If we look back in **2001**, the top 5 publicly traded companies (by market cap) were:

#	Company	Market Cap (Bn $)	# employees
1	GE (General Electric)	406	315,000
2	Microsoft	365	60,000
3	Exxon	272	98,000
4	Citi	261	270,000
5	Walmart	260	1,000,000
	Total	**1,564**	**1,743,000**

As you can see it, in 2001, the top five publicly-traded companies had a combined market capitalization of $1.56tr for slightly over 1.7 million employees. In today's economy (**June 2017**), we have the following top five:

#	Company	Market Cap (Bn $)	# employees
1	Apple	740	116,000
2	Alphabet	650	72,000
3	Microsoft	535	114,000
4	Amazon	456	340,000
5	Facebook	427	17,000
	Total	**2,808**	**659,000**

The combined market cap of the current top 5 US public companies is approaching 3 trillion US Dollars (almost twice bigger than the 2001 top 5), but the workforce has dramatically shrunk with a total of 659 thousand employees.

4. The 'incredible' Tesla Story

I thought that another story to mention is the one on Tesla. With the stock price more than doubling since last December, Tesla market cap has now reached $61.50bn and overtook GM ($52bn) and Ford ($44.50bn) to become the most valuable US car maker. It has a larger market cap than French Peugeot ($16.5bn) and Renault ($27bn) and Italian Fiat Chrysler Automobiles ($16bn) all combined, and is on its way to overtake German Volkswagen ($76.5bn), the world's biggest car maker.

An 'incredible' ratio introduced by a few analysts is the market-cap-to-number-of-cars-sold. In 2016, Tesla [only] sold 76,285 cars, compare to 10 million for GM and 6.65 million for Ford. That gives us the following ratios:

#	Company	Market Cap (Bn $)	# Cars sold	Ratio ($/car)
1	Tesla	61.5	76,285	806,187
2	GM	52	10,000,000	5,200
3	Ford	44.5	6,500,000	6,846
4	Volkswagen	76.5	10,300,000	7,427

This ratio of market-cap-to-car-sold doesn't necessarily means that the stock is overvalued, but I am constantly asking myself the question 'How big can it get?'. As we did in the previous section and now that we have these ratios in mind, let's see how many employees are working in each of these car maker companies:

#	Company	Market Cap (Bn $)	# employees
1	Tesla	61.5	**17,800**
2	GM	52	225,000
3	Ford	44.5	201,000
4	Volkswagen	76.5	627,000
5	Renault	27	125,000
6	Peugeot	16.5	184,000

3. Conclusion

The goal of this article was to link the aging demographics, which is a current topic in most of the developed nations (if not all), with the new Economy and the development in disruptive technologies. The fact that more people are exiting than entering the workforce (4-to-1 ratio in the US as we saw) is going to be a burden for each over-indebted government, and the loose monetary policy run by central banks over the past decade hasn't solved this long-term issue. The liquidity added (Figure 1) since 2008 has [just] benefited to a few stocks in the public (FAAMG) and private (unicorns) sectors, which don't employ enough people to sustain a consumption-driven system, while all the other sectors are experiencing a crisis with expected job cuts.