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Consumer Credit: An Analysis of the Last 20 Years

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Introduction

Consumer credit and consumption are deeply intertwined and interdependent elements in current years but has consumer credit always been such an important determinant for households' consumption. How the concept was born, how it developed over the years and changed in economic growth years and in crises are the question this research tries to answer.

The relevancy and size consumer credit has gained in the last decades, as a key component of the credit expansion and financialization of debt from the 1980s onward motivates such a choice. Understanding better the consumer credit trend means understanding better the conditions that made it so widely used and the possible impact and implications this credit, and debt, growth could have for financial stability, consumption levels and income growth.

This work will take in consideration three main subjects, the United States, the United Kingdom and the Euro Area, with attention on consumption levels and consumer credit pre-conditions and responses., analyzing how each one reacted to three crises that occurred in the 2000/2020 span, the 2008 crisis, the European sovereign debt crisis and the Covid-19 crisis.

Monetary policy transmission mechanism and monetary policy transmission channels will be analyzed too, given their importance in alleviating liquidity and credit constraints and their deep link among interest rate, credit and income, via not only investment but also consumption.

The basics on consumption and intertemporal choices theories will be analyzed too, as a theorical foundation on which to pose the following data.

The research was conducted via confrontation of academic papers on the topics at hand, at times integrated with a bit of textbooks' economics, in order to get new insights on the matter, combining data from central banks and statistical institutions datasets. By combining and confronting different aspects, topics acquire a more complete outlining, also favored by the privilege to observe the crisis with data on the following years, which allows to clearly filter models and papers proved wrong by subsequent events (this is of course not the case for the pandemic crisis).

The credit expansion happened almost simultaneously but for different reason, in the United States stagnating income led to higher borrowing to maintain the same consumption level and led to a growth in the market for households' debt, planting the seeds for future financial distress. In the Eurozone, many peripheral countries were inebriated with the lower interest rates provided both by the new single currency and by the fierce banking competition that brought margins down, prompting a surge in private borrowing for consumption.

Rising consumption levels remain a good indicator of improving standard of life and well-being, while consumer debt trends can give a more complete look on the sustainability of said consumption levels and hint at some causes for financial distress for households.

Chapter 1

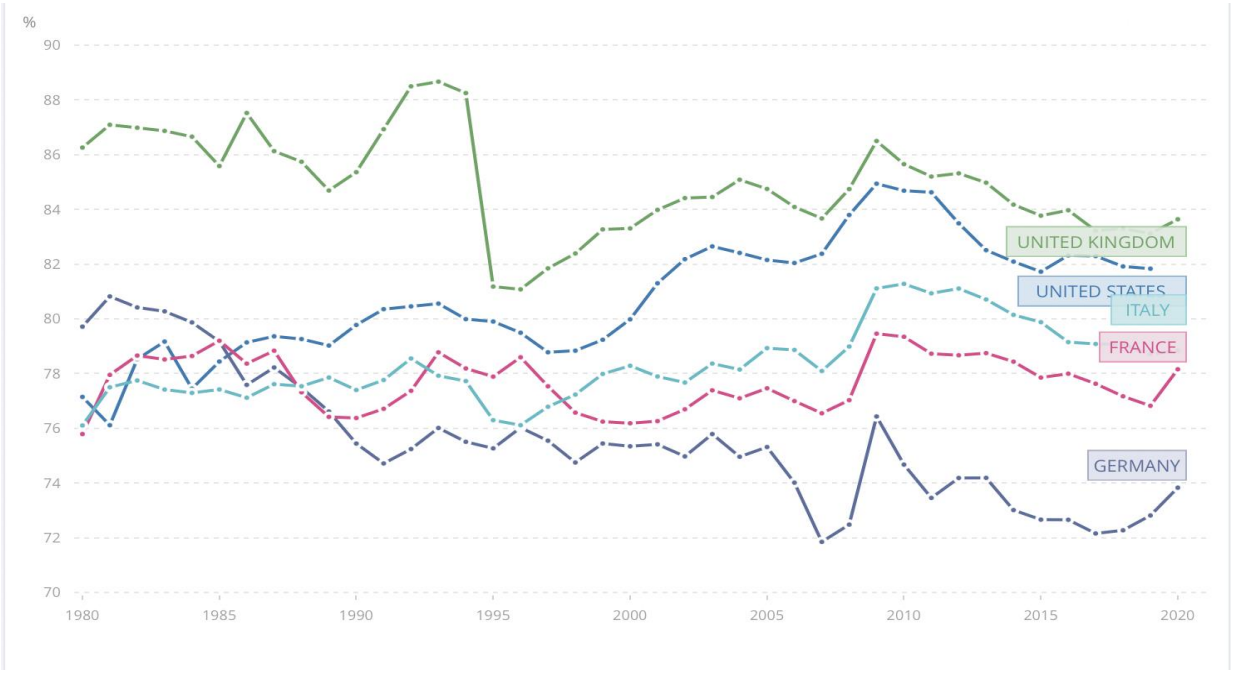
Consumer Credit and Monetary Policy.

1.1 Consumer Credit Relevancy: 2000-2020.

In modern economies, where strong modernization and high standards of living coexists, increases in consumption and income levels is a key factor in further economic development (Diacon et Maha, 2014). In such high-income countries, after 1980, the net average income increased constantly together with consumption, which rose more slowly, but constantly, with a small decrease at the peak of the 2008 crisis.

Considering major developed west economies, consumption plays a central role in determining GDP and employment levels, since it constitutes a significant share of Aggregate Demand.

Chart 1. Final consumption expenditure as % of GDP.



Source: data.worldbank.org

The chart displays aggregate consumption as a share over total GDP for the United States, the United Kingdom and the three first euro area economies, Germany, France and Italy, as a euro area sample. Data shown, from 1980 to 2020, clearly shows the relevance of consumption in national income formation, as the following table shows.

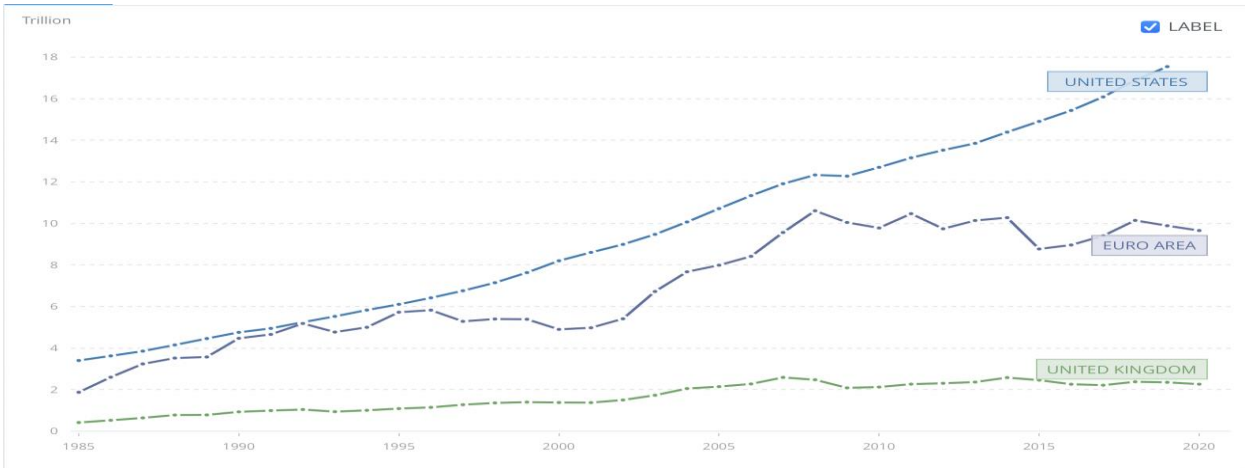
Table 1. Total Consumption over GDP ratio.

Country	Year	Consumption/GDP	
France	2020	78.2	
Germany	2020	73.8	
Italy	2020	78.8	
United Kingdom	2020	83.6	
United States	2019	81.8	

Source: data.worldbank.org

The most recent values confirm the trend, even in the uncertain economic conditions caused by the Covid-19 Pandemic of 2019-2020. To further clarify consumption rise, the following chart considers raw final consumption expenditure expressed in current US$, for the United States, United Kingdom and Euro Area.

Chart 2. Final consumption expenditure (current US$), United States, United Kingdom, Euro Area, (1985-2020).



Source: data.worldbank.org

This chart clearly shows the rise in consumption levels, as in Chart 1, the almost stable values for consumption over GDP ratio after 2010/2011 can be explained as GDP rose together, although with slightly higher values.

Even though total consumption levels kept rising, middle and lower class households' income in the United States, the United Kingdom and Western European countries rose at a slower pace.

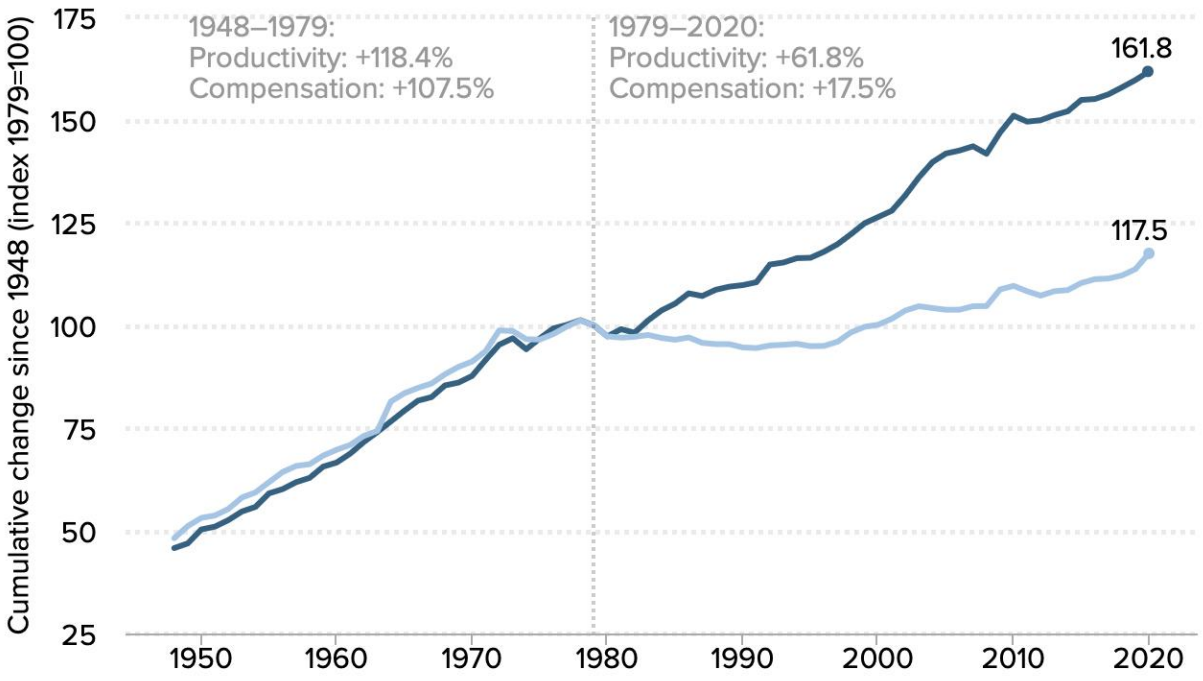
After the 1980s income inequality started rising significantly after a period of relative stability in the 1960s and 1970s, and the trend remained positive throughout the following years till 2008 (Russo et al, 2016).

"Since 1980, in most advanced economies the median wage has stagnated and inequalities have surged in favor of high incomes" (Fitoussi and Stiglitz, 2009), with empirical data showing a large increase in income share of the rich (Russo et al, 2016).

Since consumption was constrained, profitable investment potential in the real economy reduced, encouraging an ever-wealthier elite to floos financial markets with credit, keeping interest rates low,

stimulating the creation of new financial instruments, greater indebteness and speculation. Households had to struggle to maintain the welfare of their families and their relative social status, which greatly reduced household saving, with more debt and longer work hours (Jon D. Wisman, 2013)

Chart 3. Productivity growth and hourly compensation growth, 1948-2020, United States.



Source: EPI analysis of unpublished Total Economy Productivity data from Bureau of Labor Statistics (BLS) Labor Productivity and Costs program, wage data from the BLS Current Employment Statistics, BLS Employment Cost Trends, BLS Consumer Price Index, and Bureau of Economic Analysis National Income and Product Accounts.

Notes: Data are for compensation (wages and benefits) of production/nonsupervisory workers in the private sector and net productivity of the total economy. "Net productivity" is the growth of output of goods and services less depreciation per hour worked.

This bad distribution of income could explain the financial and credit expansion happening in the same years, as more credit, and especially consumer credit was demanded to maintain the same level

of consumption in presence of lower income, as in the harpoon effect discussed by Duesenberry (see Chap. 1. b).

Consumer credit is a form of financing oriented only to consumers, i.e., physical people requesting financial resources for reasons not linked to their professional or entrepreneurial activities. In economic terms, consumer credit is a financing channel to satisfy demand for goods beyond the limit imposed by current available income through a deferment of payments. Goods bought via consumer credit usually are durable goods and can therefore be seen as a form of investment choice themselves. (Mishkin, 2006).

Consumer credit is a relatively modern phenomenon. Beginning in the nineteenth century, installment payment plans were made available by sellers for purchases of furniture, sewing machines, and other domestic goods. Before the 1920s, however, there were few demands for credit for automobiles, durable goods, college tuition, and home modernization and repair that make up the bulk of consumer credit use today. Also, few financial institutions in the nineteenth and early twentieth centuries were willing to extend consumer credit; lenders did not have sufficient information to assess the creditworthiness of most individual borrowers, and the costs of managing such loans in any number would have been prohibitively high. (FED Report, 2006)

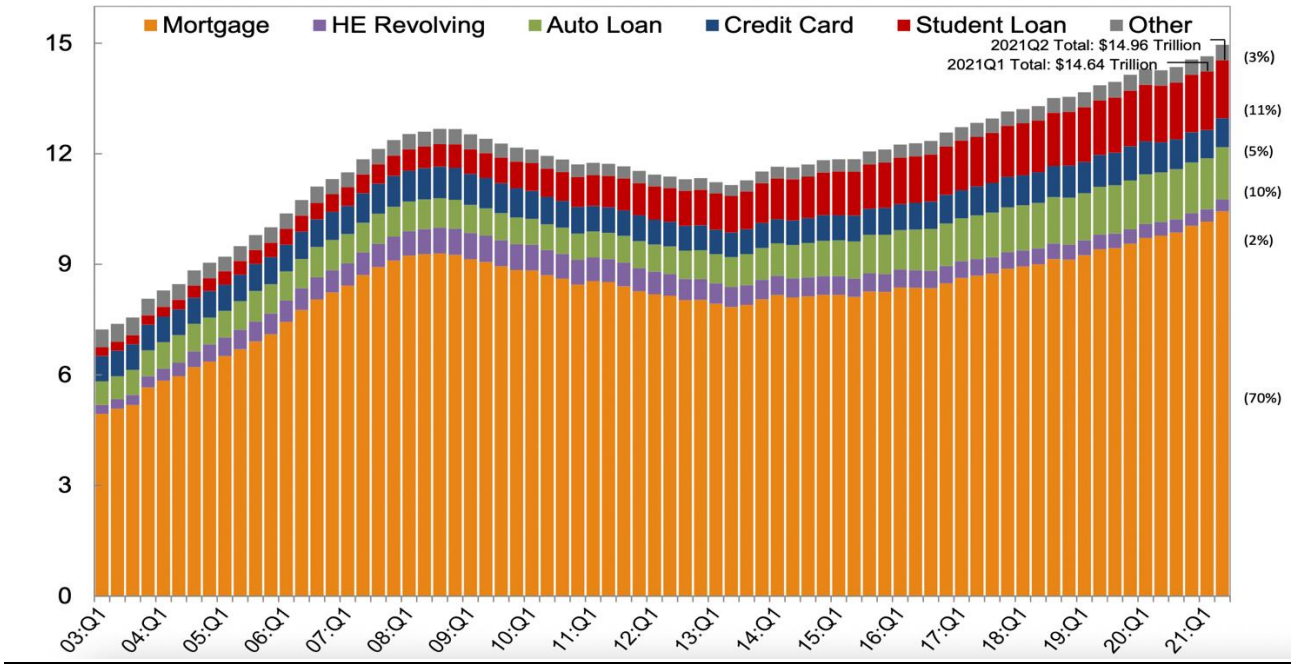
Comparing the influence of consumer credit on aggregate demand and households' expenses requires to take a swift look at the evolution of the channel in the early 2000s', looking both at the most advanced financial markets economies, the US and the UK, and the euro area, where consumer credit's use grew significantly at the start of the new millennium.

The early 2000s.

The relevance of consumer credit market grew across all major economies from the end of the 1990s' and to the early 2000s', as a result of structural changes in the majority of western countries, mainly income growth stagnation, that led to a decrease in propensity to save and a greater financialization of debts (A. Lopes, 2007). Apart from the US and UK, euro area countries experienced similar changes with an average growth in family debt of around 7% between 2000-2004; at the end of 2004, households' credit, so consumer credit and other financing forms, contributed for 15% to the GDP.

The following chart unpackages this debt composition for the US market, showing also a growth trend that accompanies the one seen in Chart 2.

Chart 4. Total US households Debt Balance and its Composition.



Source: New York Fed Consumer Credit Panel/Equifax

As chart 4 clearly shows an overall positive trend can be appreciated on the debt balance for households, even considering the decrease observable after the 2008 crisis and the credit tightening that followed.

This lending boom that was happening around the world, although in different forms and magnitudes - the US market was experiencing pre-2008 growth, Eurozone and New Europe countries especially were tipping toes in new levels of financial competition and integration - was looked suspiciously as research papers questioned its origins and causes. The general understanding was that this credit growth was mostly due to the supply side, encouraged by a good macroeconomic environment with good growth prospects and generally low interest rates, especially in Europe, given the hopes regarding European integration and stability. These effects were incredibly strong in New Europe countries, were

households' credit, composed by both mortgages and consumer credit rose significantly in the years 2000-2004. The following table shows such variations in both the Eurozone and New Europe countries[1] (Coricelli et al, 2006).

Table 2. Forms of Debt in Eurozone and New Europe.

	Eurozone		New Europe (1)	
	2000	2004	2000	2004
Growth in debt (% annual average 2000-2004)	**7%**		**23%**	
- Growth in mortgages	8%		43%	
- Growth in consumer credit	2%		13%	
- Growth in other loans	4%		21%	
Debt/Gross disposable income (%)	**68%**	**75%**	**9%**	**18%**
Debt/GDP (%), of which:	**46%**	**50%**	**7%**	**12%**
- Mortgages (% GDP)	29%	34%	1%	4%
- Consumer credit (% GDP)	7%	7%	4%	5%
- Other loans (% GDP)	9%	9%	2%	3%

Source: F. Coricelli et al, 2006, from UniCredit New Europe Research Network database, based on ECB, National Central Banks and Eurostat.

Particularly interesting is the situation in the New Europe countries where credit growth was astonishing, and again, caused worries for the lower and lower criteria on which financing was conceded. Stronger competition between foreign banks brought profit margins down, encouraging more risky loans (Coricelli er al, 2006). The following table shows data from most of these economies and Turkey, in the span 2000-2005.

[1] "New Europe Countries" is a collective title comprising countries who recently entered the European Union but are not part of the eurozone, such as Romania, Latvia, Bulgaria, Hungary Estonia, Croatia, Czech Republic, Slovakia and Poland.

Table 3. Structural Indicators.

	Households Debt/GDP 2004[v]	Mortgage/ Households Debt 2004	Real lending growth (CAGR '00-'04)	Mortgage growth – Consumer growth (CAGR '00-'04)	Avg Int. Rates Level (2000)[i]	Avg Int. Rates Level (2004)[i]	Avg inflation 2000[iii]	Avg inflation 2004[iii]	Avg Economic growth 2000-2004 (CAGR)
Romania	5%	29%	106%	11%	52%	26%	46%	12%	6%
Latvia	19%	64%	68%	32%	13%	9%	3%	6%	7%
Bulgaria	12%	22%	58%	21%	17%	13%	10%	6%	5%
Hungary	20%	48%	45%	43%	22%	15%	10%	7%	4%
Estonia	24%	70%	39%	17%	11%	6%	4%	3%	7%
Croatia	32%	37%	26%	5%	12%	8%	6%	2%	4%
Czech R.	14%	55%	25%	10%[ii]	9%	8%	4%	3%	3%
Slovakia	10%	55%	21%	-32%[iv]	14%	7%	12%	8%	4%
Poland	13%	31%	10%	32%	14%	7%	10%	4%	3%
Turkey	6%	10%	4%	10%	49%	34%	53%	10%	4%

Source: F. Coricelli et al, 2006, from UniCredit New Europe Research Network database, based on ECB and National Central Banks.

A similar credit expansion was happening in the United States too, where higher levels of credit were linked with riskier lending and lower prerequisites for access to loans and mortgages, feeding the housing market growing prices and preparing the groundwork for 2007/08 collapse.

The following table displays sign of growing financial distress on households' debt, compiling cases of bankruptcy on financial obligation as a whole: payments on revolving credits, mortgages and non-revolving credits.

Chart 5. Consumer bankruptcy filing, 1980-2005.

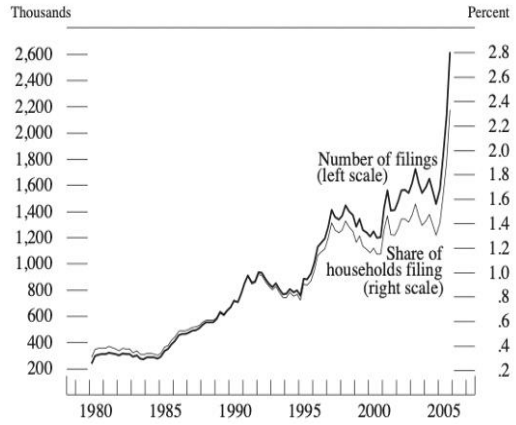
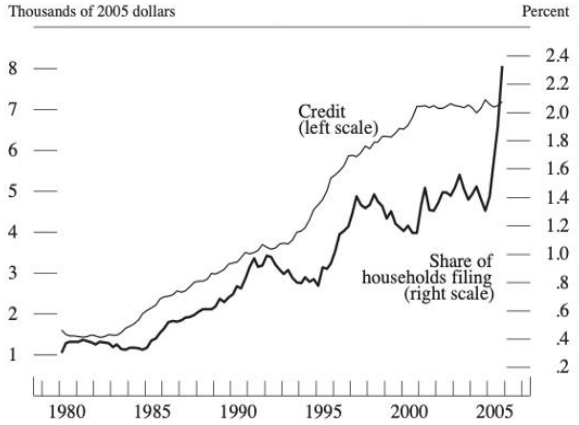


Chart 6. Consumer bankruptcy filings and inflation adjusted amount of revolving credit per household, 1980-2005.



Source: Federal Reserve Board estimates on Administrative Office of US Courts and Census Bureau.

Note: Data are quarterly at an annual rate.

In the Us, consumer credit growth accounted for a modest share of the credit expansion, circa 20%, and it is mostly linkable to the growing use of credit cards.

2020 and the Pandemic.

The credit expansion in the early 2000s' was in fact part of a bubble, as some suspected (analyzing it in the years before the infamous 2007/08 crisis blew up, with the notorious effects on real economies around the world.

But an analysis on consumer credit in 2020 must face a whole new crisis linked to the spread of a Corona Virus, Covid-19, which caused a pandemic that forced the world in lockdown, halting production, trades and long-distance travels and transportation of goods, de facto freezing economic gears.

Consumer credit and retail credit in general fell sharply in the first months of 2020, with data inversely following quite accurately the level of new Covid-19 cases registered.

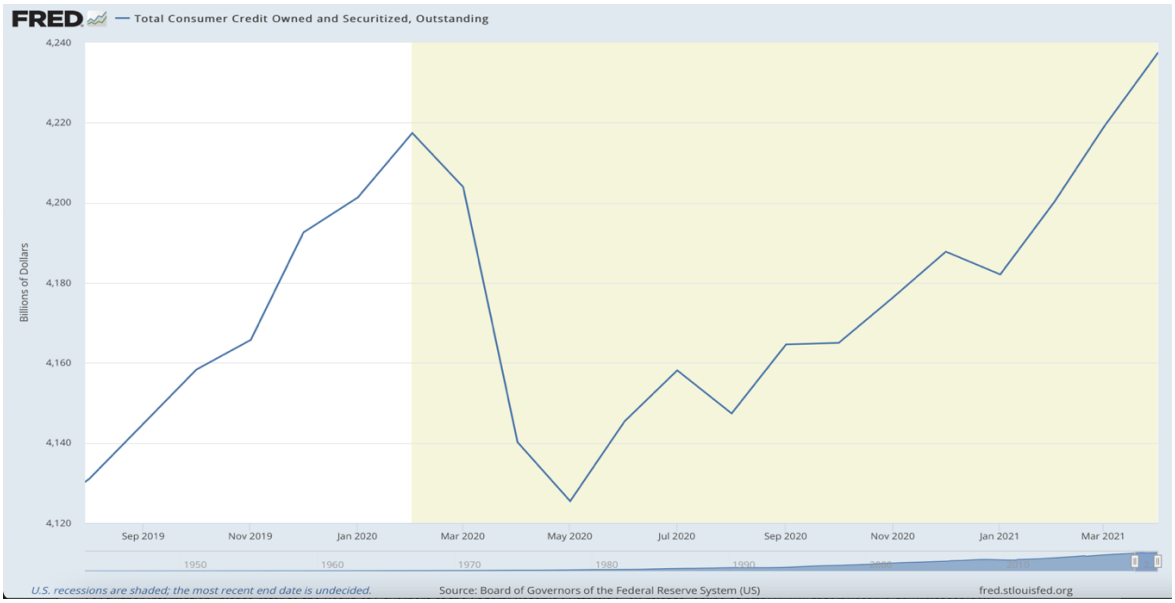
From all, the Italian case is particularly emblematic given the country was the first western country hit by the pandemic, the first to introduce quarantine measures and restrictions and one who suffered the most from consumption reduction with a -8.9%, second only to Spain -10.9% (Dimitris Christelis et al, 2021). Reduction in credit availability with rising liquidity constraints,

worsened economic outlook and falling consumption levels due to the disaggregation of consumption itself for lockdown protocols are the core of the pandemic induced crisis. In the first nine months, in Italy, retail credit reduced by 24,8% compared to the previous year and risks associated with retail credit went up to a still contained 1,9% overall default rate, a value that inverted the downward trend observable in 2018/19 (Assofin, Prometeia, 2020).

The uncertainties tied to Covid-19 pandemic together with the limits imposed on movement and the doubts on the time needed to go back to "normal" brought families consumption down, with values lower and lower until the first trimester of 2021. With the propensity to consume at such a low point, credit, and particularly consumer credit levels went down too, as there were no durable goods bought to finance or consumption levels to maintain. In numbers, loans to buy durable goods, such as electronics, furniture, renewable energy house-implants and other services, experienced a -15,2% compared to 2019, although in the last trimester of 2020 a sudden rise in furniture expenditure reached a +14,4%, caused by the re-opening of physical stores and the growing need to make the houses more comfortable, given the larger amount of time spent inside them.
In the US market, the total consumer credit owned and outstanding fell abruptly after a long growing trend after the 2007 crisis. Values at an all-time high in February dropped by 92 billion USD in May, the lowest point reached, after which the slope came back to a positive value, although growth was weaker and slower than before the Pandemic (FRED.Stlouisfed.com).

As 2021 begun, the retail credit and consumer credit started rising again, as cited by the Fed: "*In the US Consumer credit rose by 18.61 billion USD in April 2021, following a downwardly revised USD 18.6 billion gain in the previous month and well below market expectations of a USD 22 billion rise. Revolving credit went down by USD 1.96 billion while non-revolving credit went up by USD 20.57 billion. On an annual basis, consumer credit rose 5.3 percent, following a 5.3 percent gain in March".*

Chart 7. Total Us Consumer Credit Owned and Securitized, Outstanding.

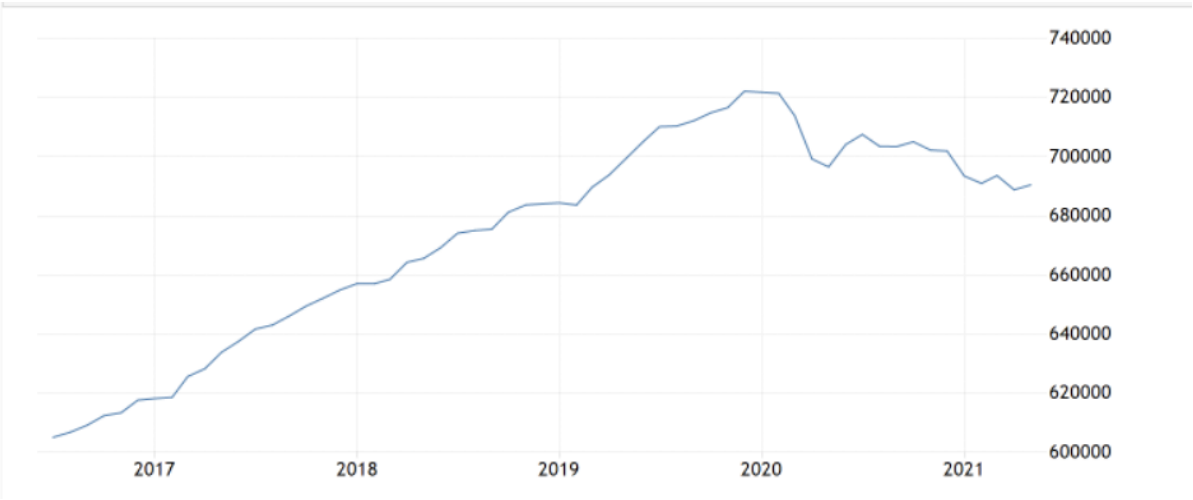


Source: fred.stlouisfed.org

The graph above reports data relative to the US and shows the upper discussed trends. The sharp fall in March, the lowest point in May and the weaker growth in the following months, until expansion gained momentum as in February 2021. More recent data are yet to be collected.

In Europe Consumer Credit experienced the same downfall in the first trimester of 2020, without showing the same positive recovery occurred in the Us market, the trend stays negative although effects of newly implemented policies might invert the downward trend and sustain a positive growth. Forecasts differ according to the amount of the recovery, but Consumer credits level are expected to grow again, even though more slowly than in the Us.

Chart 8. Total Eurozone Consumer Credit.



Source: tradingeconomics.com on ECB data

This chart shows Consumer credit data for the Eurozone in Millions of Euros, on the y axis, in most recent years, where a positive trend can be observed until the first effects of the Pandemic in 2020.

1.2 Consumer Credit relevance in intertemporal choices theory: the baseline models.

Income is a crucial determinant of consumption, but access to credit sources and subsistence activities are also very relevant. Of course, besides economic factors, psychological ones also play an important role, as noted by Katona (Katona et al, 1960), who claimant that the *ability to buy* is not enough, because consumption expenditures are also dependent on the *willingness to buy*. This willingness is influenced by individual rationales, such as attitudes and prospects of future income, and by the state of the whole economy, which create a general optimistic or pessimistic environment. (Diacon and Maha, 2014).

All and all, however, to analyze credit relevance, a survey of the most famous modern consumption theories is useful and necessary.

The intertemporal choice and two period model.

Fisher's theories are the basis for much work on consumption and its function.

Fisher assumes that the consumer is rational and tries to maximize his lifetime utility by regulating his present and future consumption. This constitutes an intertemporal budget constraint that limits consumption based on total resources available at present and future time.

This intertemporal budget constraint takes the form of the following equation:

$$(1)\ C1 + \frac{C2}{1+r} = Y1 + \frac{Y2}{1+r}$$

Where C stands for consumption and Y for income, in Period 1, the present and Period 2, the future. The left side of equation (1) represents present value of lifetime consumption, where the right side stands for present value of lifetime income, so that equation (1) shows all combinations of C1 and C2 that consumes all the consumer's income.

The slope of the line described by equation (1) has a slope of negative (1+r), where r is the interest rate used to actualize period 2 variables. The consumer will optimize its consumption choosing C1, C2 values determined via the confrontation of equation (1) and the indifference curve with

slope Marginal Rate of Substitution or MRS, relative to Consumption 1,2 tangent to the budget constraint, i.e., the optimal point:

$$(2)\ \ 1 + r = MRS$$

In this model a rise in Y increases consumption, both C1 and C2, regardless of whether the income increase occurs in period 1 or 2. A rise in r, on the other hand, may decrease C1 and increase C2, due to the Income and the Substitution effect.

If the consumer is a saver, the rise in r means he can increase consumption in both periods (income effect), as for (1), while the rise in r increases the opportunity cost of current consumption, which tends to reduce C1 in favor of C2 (substitution effect).

In Fisher's theory the timing of income is not relevant in determining consumption choices, because a rational consumer expecting an increase in his future income can borrow in the present to spread the extra consumption over both periods by borrowing in the present. If borrowing constraints are introduced, however, he may not be able to increase C1 and, even though he is rational and forward looking, his consumption behavior could be better described by the Keynesian theory of Absolute Income.

The Absolute Income Hypothesis.

This Hypothesis implies a consumption theory strictly linked to some of Keynes' ideas expressed in The General Theory published in 1936. It derives from four different conjectures:

1. Real consumption C is a stable function of available income Y.
2. The marginal propensity to consume, MPC, has a value above zero but inferior to 1.
3. As Y rises, the average propensity to consume, APC, decreases, but is still higher than MPC.
4. As Y rises the value of MPC decreases.

This synthesis (Annamaria Variato, 2009) has roots in various chapters of The General Theory.

In particular, the second assumption derives from the *fundamental psychological law* of consumption, which states that, ceteris paribus, individuals will be keen to consume more given a higher available income, but not in a measure to perfectly follow the rise in income.
As for assumption four, it derives from Keynes' idea that MPC was not stable in case of changes in occupation and real income and specifically that MPC would decrease as occupation level rises.
Mathematically, the Absolute Income Hypothesis can be expressed as a linear consumption function:

$$(3)\ C = a + bY$$

With $a > 0$ and $0 < b < 1$.

This linear consumption function describes the basic components of the Keynesian system of aggregate demand. A consequence of the linear form is that MPC is constant for different values of available income.
Based on this model, economists predicted that consumption C would grow slower than Income Y, but long time series analysis showed that C/Y ratio was very stable, as APC did not fall.

The Relative Income Hypothesis.

This hypothesis was proposed and developed mainly by James Duesenberry in 1949 and consists of the following two ideas:

1. At a certain time, utility functions are *socially determined*, interdependent between individuals belonging to same income groups, that will try to conform their consumption to a level considered the standard or the norm – the "demonstration effect".
2. Utility functions are interdependent with different level of consumption at different times for the same individual, so that families that enjoyed a higher standard of living will hold to this consumption level even if their income was to fall – the "harpoon effect".

The relative income theory tried to explain the growing discrepancies displayed in observation on empirical data, particularly on long time series analysis, that didn't coincide with Keynes'

original model. Although original and interesting in its highlighting the social nature of consumption, Duesenberry model has quickly fallen behind new theories.

This model, with its almost philosophical focus on the social side of consumption would deeply intertwine with consumer credit, given that both the demonstration and the harpoon effects would need such a form of funding.

The Life Cycle Hypothesis.

The life cycle hypothesis is a model developed by Nobel laureate Economist Franco Modigliani and two of his brightest students, Richard Brumberg and Albert Ando. The theory behind the model assumes that individuals make consumption choices considering both resources available over their lifetime and current resources immediately at their disposal.
Rational individuals save up when working in early stages in life and de-save once retired, making use of the built-up stock of assets. Individuals will, then, alter their consumption decisions to satisfy their needs in different phases of their lives.

The hypothesis makes the case of an individual consumer with an expected Y yearly income, who expects to live T years still and to retire after R years and has W saved up wealth.

His total stock of assets consists of the income he will earn in the remaining working years $(Y * R)$ and his initial wealth stock W. The model considers a stable annual income and an interest rate of zero, so to not have to calculate the interest that could be earned by investing savings over the years.

The consumer can then find its equilibrium level of consumption C by dividing $(Y * R)$ by the length of his life in years, T. By doing so he gets

$$(4)\ \ C = \frac{(Y*R)+W}{T}\ ,$$

that can be written as:

$$(5)\ C = \frac{1}{T} * W + \frac{R}{T} * Y.$$

Assuming all individual consumers will follow the same scheme, the model can be generalized to describe the aggregate consumption function:

$$(6)\ \text{AC} = \alpha * \text{W} + \beta * \text{Y}$$

With α being the marginal propensity to consume for wealth and β the marginal propensity to consume for income.

The Life-Cycle hypothesis can explain the stability of APC that the Keynesian model didn't foresee, since the APC implied in the consumption function (6) is:

$$(7)\ \frac{C}{Y} = \alpha\ \left(\frac{W}{Y}\right) + \beta$$

Across households, wealth does not vary as much as income, so high income households should have a lower APC than low-income households. Overtime, wealth and income increase, causing APC to remain stable.

<u>The permanent income hypothesis.</u>

The permanent income hypothesis was developed by Milton Friedman, a Nobel laureate American economist, in his 1957 book "A Theory of Consumption Function".

Basing his work on Fisher's theory on saving (1907,1930) Friedman argued that the level of consumption does not depend only on current level of income, but rather on the "permanent income" defined as "the amount of consumption the individual can afford keeping wealth intact".

In this model, sudden upwards movement of income level does not affect the permanent income as much because these "windfalls", as Friedman himself says, are considered merely transitory and ineffective in changing significantly the level of consumption.

Mathematically, the permanent income can be expressed as:

$$(8)\ y_{P_t} = iW_t$$

Where y_{Pt} e W_t stand for permanent income and wealth respectively.
The t index shows how both variables depend on the current period.
Finally, i is the interest rate, fixed by hypothesis.

A survey on recent studies on consumption.

In a paper titled "The response of expenditures to anticipated income changes: Panel Data Estimates" by Browning et Callado (2001), Spanish micro data are examined to understand consumer response to the payment of an institutionalized extra wage in June and December. The extra payment was reserved to full time workers, so a comparison is conducted confronting their consumption behavior with the one of workers without extra wage payment.

Their study reveals no evidence of significant sensitivity to the extra payment, so that consumption between two groups had no notable difference, arguing that earlier researcher found a large response of consumption to predicted income changes under the condition of bounded rationality.

The conclusion is that consumers tend to smooth their consumption, so that a change in consumption happens when predicted income changes are large, but less likely in the event of a smaller modification.

In a more recent paper titled “Household expenditure and the income tax rebates of 2001” Johnson et Parker (2006) conduct an analysis on the US large income tax rebate program, consequence of the Economic Growth and Tax Relief Reconciliation Act of 2001. The program provided tax rebates to approximately two thirds of US households, for values varying between $300 and $600.

The rebate checks were mailed randomly over a 10-week period, from late July to the end of September 2001, allowing the authors to identify the causal effect for the rebate by comparing the spending of households which received the check earlier and compare their consumption profile change with the later receiving ones. According to the Permanent Income Hypothesis, a single rebate would have little effect on spending. Furthermore, in the absence of liquidity constraints, spending should increase as soon as consumers begin to expect the tax cut, and not only after they received the check.

The average households spent 20% - 40% of its tax rebate check on nondurable goods during the three months the check was received, finding that expenditure shifts were more significant for households with relatively low liquidity and low income, a consistent result with liquidity constraints effects on consumption, as discussed by Fisher.

1.3 Monetary Policy Transmission and Consumer Credit.

There are different views on how consumers organize their consumption patterns, as discussed in Chapter 1 – b, but there are also undebated elements which can influence aggregate consumption levels increase or decrease. Income, and especially expected income, is a crucial part in all consumption hypothesis, even if different models give different relevance to sudden and small change.

As another example, a stable and healthy financial environment, eases or significantly reduce liquidity constraints, as in period of financial distress, crisis or uncertainties, asymmetric information may rise and lenders availability to lend may decrease, imposing such borrowing limits on many households, without the possibility to smooth out consumption.

Another relevant variable are interest rates, which can affect consumer spending through the substation effect and the income effect. The income effect increases consumption if the consumer has positive savings, since his savings are worth more with higher interest rates. The substitution effect decreases the consumer's consumption since higher interest rates raise the price of consumption, given that each unit consumed is a unit dis-saved.

Income trend, financial stability and interest rates can change based on a variety of reasons, including political stability or instability, the current phase of the business cycle or exogenous shocks tied to spikes in raw materials' costs, prices levels and rate of inflation or, last but not for significance, monetary policy.

This latter, though not being an all-problems *panacea*, definitely has a strong role in determining key variables at the base of consumption behavior, through the monetary policy transmission channels.

Regarding these transmission channels, the focus will be on the ones regarding Consumer Credit, as to understand how monetary policy can affects credit availability and influence consumption, via income growth, credit expansion and assets reevaluation.

Before specifically discussing the credit transmission channel, a short note is necessary as even interest rate channel work its way passing through credit. The conventional schematic following a monetary expansion, as in Mishkin (1996):

$$(9)\ M \uparrow = i_r \downarrow = I \uparrow = Y \uparrow$$

The lower cost of money stimulates a higher level of investments, leading to an increase in aggregate demand and output, all in line with a standard IS-LM model. As Mishkin himself noted, although Keynes thought this channel operated primarily through business investments, households spending and consumer decisions over housing and durable goods, both classifiable as *investment choices*, account for a significant share of the expansionary effect.

Discussing further on conventional channels would deviate from the scope, but before getting to credit channels, it is necessary to point out that the interest rate considered in the schematic is the real interest rate, not the nominal one.

Credit channels:

- Bank lending channel.

  The bank lending channel takes in consideration the special role banks have in solving problems deriving from asymmetric information, due to their intermediaries' position.

The schematic from Mishkin (1996) is as follows:

(10) M ↑ => bank deposits ↑ => bank loans ↑ => I ↑=> Y ↑

This channel works better in an environment where banks still play a central role in

financing firms, so it is more effective towards smaller firms, as already noted by Mishkin, rather than bigger firms, which can refinance themselves issuing bonds or commercial paper on money markets. It would be safe to assume then, for the same reason, this channel will work better in presence of a less developed or strictly regulated financial markets, as in the case for continental Europe, and especially in countries with economies heavily dependent on small and medium firms.

- Balance sheet channel.

The balance sheet channel clearly refers primarily, but not exclusively to firms.

Briefly, the schematic from Mishkin (1996) is as follows:

(11)M ↑ => Equity Prices ↑ => adverse selection and moral hazard ↓=>lending ↑ => I ↑ =>Y ↑

That's to say, an expansionary monetary policy causes a rise in equity prices which lower adverse selection and moral hazards and leads to higher investment spending and higher aggregate demand.

A monetary expansion will influence firms in two other, notable ways.
First, lower interest rates will smooth the credit rationing phenomenon, leading less-risk prone borrowers to borrow more and less risk-prone lenders lo lend more.
Secondly, the lower short-term interest rate should ease the nominal pressure on firm's debts, making the liabilities easier to endure without reducing the real value of the firm assets.

- Household Balance-Sheet Effects.

The latter transmission channel discussed for firms is equally valuable for households and consumer spending. A decrease in interest rates will improve a household's balance sheet since consumer's cash flow will be positively affected. Purchase of durables and

expenses for housing will increase too, thanks to lower cost of borrowing for households without access to other forms of credit.

The schematic is as follows:

(12) M ↑ => Equity Prices ↑ => financial assets ↑ => likelihood of financial distress ↓ => consumer durable and housing expenditure ↑ => Y ↑

Declining cash flows for consumers will induce fear of future financial distress, reducing desire to buy durable goods and housing, leading to less spending and lower aggregate output. In the schematic of this channel this happens not for the lenders unwillingness to lend. But rather from the consumer refusing to spend.

Unconventional Monetary Policy Transmission Channels.

The following channels are taken from the 2011 article "The United Kingdom's quantitative easing policy: design, operation and impact" by Joyce et al, discussing QE transmission channels related to the BOE assets purchase program.

QE transmission channels (Joyce et al, 2011).

Policy signalling channel.

Multiple assets purchase lead market participants to expect longer low rates by signalling them the central bank determination in achieving its inflation target.

This ensures that expected inflation remains anchored to the central bank's target, avoiding expected inflation to drop causing real interest rate to rise, even if nominal interest rates are very low.

Portfolio balance channel.

Central Bank assets purchase push up the prices of those assets and others. Higher prices on assets mean lower yields and, on the other side, lower borrowing costs for firms and households, increasing the net wealth and stimulating spending.

Confidence channel.

The assets purchase program by the Central Bank can lead to a better economic outlook, boosting consumer confidence and willingness to spend, increasing assets prices too via a reduction of risk premia and a rise in expected dividends and profits and further improving balance for households and firms.

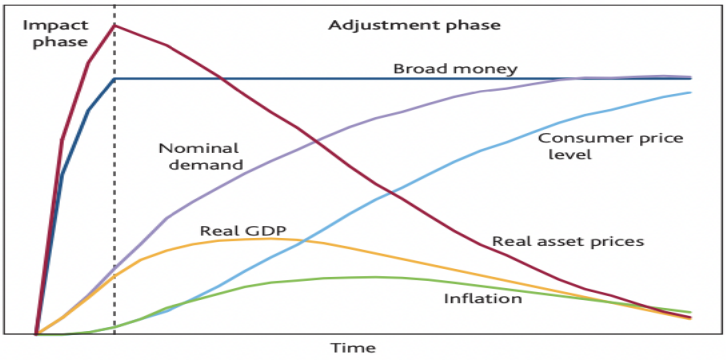
Liquidity premia channel.

Market functioning is heavily influenced by liquidity presence in the markets themselves. Central bank's assets purchase can then increase liquidity via actively encouraging trading, so that assets prices may increase given lower premia for illiquidity.

Bank lending channel.

When non-banks buy assets the banking sector obtains new reserves at the central bank and a corresponding increase in consumer deposits. More liquid assets may push banks to extend loans conceding more credit. Of course, this channel is directly dependent on the stability and health of the financial and banking sector, as noted by Joyce et al, in the original article.

Chart 9. QE qualitative effects.



Source: Joyce et al, 2011.

This chart shows the two phases, the impact phase and the adjustment phase of the economic response to the asset purchase program carried out by the BOE and analyzed by Joyce et al, in the aforementioned paper.

Chapter 2. Recent developments.

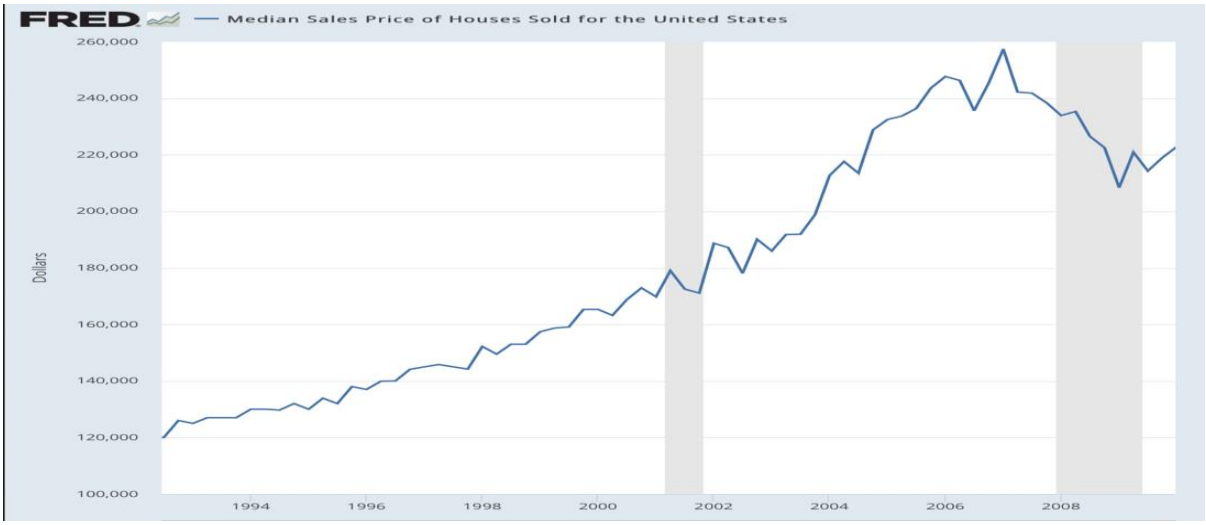
2.1 From the Global Recession to the Pandemic: synthesis of the last ten years' economic trends.

The 2008 Crisis.

The 2008 crisis has been the subject of numerous articles, documentaries, books and even movies, all trying to grasp the reasons and the causes at the heart of the financial disaster, notable for many reasons but mostly for its severity and speed. Financial and banking institutions worldwide accused severe stress and damage, leading to the infamous climax with the Lehman Brothers' implosion on September 15th, 2008. An event that sent the international banking system in total chaos.

The crisis started as a Us financial crack, then spread trough the banking system becoming a global economic crisis, the Great Recession. To chronologically track the unfold of the crisis one must start from the low interest rates of 2000/04. Under Greenspan's governance the Federal Board opted for a series of cuts that brought the target federal fund to 1,75%, when it had been 6,5% two years before. The action was justified to restart the economy after the dotcom bubble burst and, mostly, the terrorist attacks on the World Trade Center in September 2001. The low interest rates were at the heart of the growing prices in the housing market, as they allowed more and more mortgages to be conceded to lower income Americans, mostly via ARMs, or Adjustable-Rate Mortgages. The key characteristic of an ARM was a significantly low interest rate on the first two years, followed by a substantial rise at the third year that would have made monthly payments unbearable if not via a new refinanced ARM, allowed by the relentless rise in house prices.

Chart 10. Median Sales Price of Houses Sold for the US.



Source: Fred.stlouisfed.org on US Bureau of Economic Analysis' data.

The housing market bubble was a reason for the crisis, but not the only one.

In the speech given at the Russell Sage and The Century Foundation on 13th April 2012, Fed governor Ben Bernanke argued that factors often cited as the main cause for the financial crises, i.e., subprime mortgages, could not explain the magnitude of the economic and financial reaction alone, given that similar fallout didn't follow the dotcom crisis. So, the boom and busts of the U.S. housing market were the trigger, while the vulnerabilities were the heavy reliance on the shadow banking sector for various forms of easy, flexible and low perceived cost of short-term wholesale funding, allowed by gaps in their statutory framework, that led to a higher leverage and greater maturity mismatch in the whole sector (Spence, 2008). Private-sector's lack of capacity in tracking risk exposure, poor risk management and misunderstanding of new exotic derivatives led to inadequate risk diversification, where Rating agencies' triple A ratings of asset-backed securities resulted from conflict of interest and faulty models. Coval argued that the excessively high ratings received by structured instruments are attributable to the excessive confidence that rating agencies had in their own abilities to assess risk (Coval et al, 2009).

As Bernanke said in a previous comment, the crisis revealed a need to improve supervisory practices and internal communication, particularly strong risk-management practices in good times as well as bad (Bernanke, 2009).

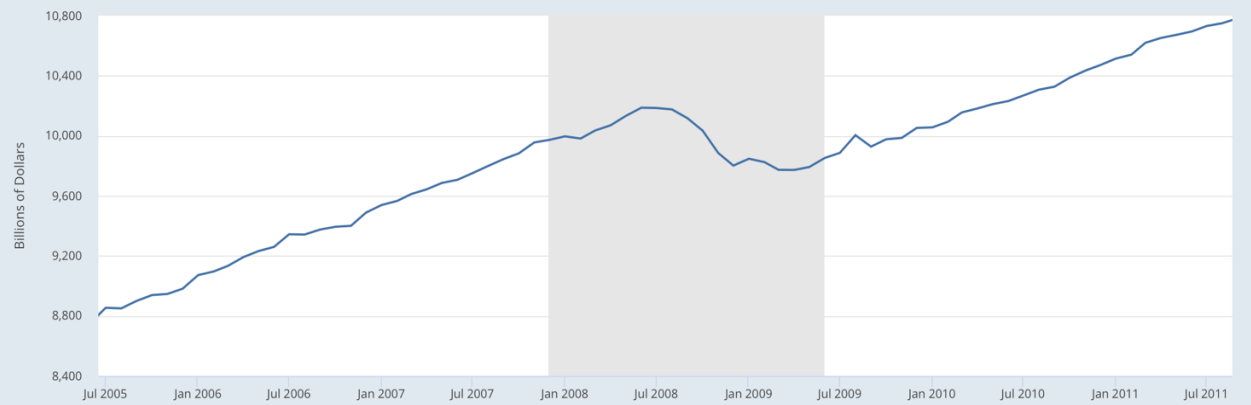
The 2008 crisis' impact on consumption.

The United States.

US household consumption met a sharp decline at the end of 2008 as a result of the worsening economic condition, more scarce credit availability and more uncertainty, following the financial crisis (Jaewoo Lee et al, 2010).

US consumption levels have a relevant role both for the US economy and the global growth prospect, considering both the dimension of the American market and the significance of the American commercial deficit, necessary, by definition, to sustain surpluses around the world (Blanchard, 2009).

Chart 11. US Personal consumption expenditure.



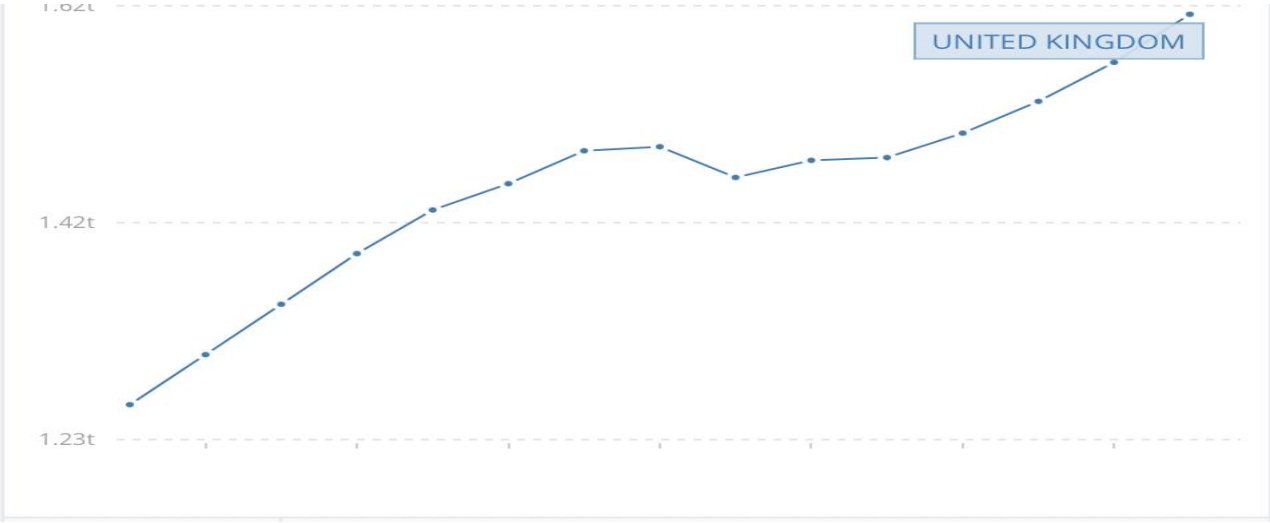
Source: Fredstlouisfed.org on US Bureau of Economic Analysis data.

Chart x shows clearly a halt in the positive trend in personal consumption expenditure, that had lasted since the 80s'. At the time, fears about a stagnation of consumption expenditure rose as the weakened outlook for long term growth persisted with tighter credit conditions caused by a rediscovered appreciation of risks and decline in wealth, particularly households' wealth whose recovery time is quite slow (Greenlaw et al, 2008). The consumption, however, greatly beneficiated from the following monetary policies implemented by the Federal Reserve, as shown in chart x and further discussed here in Chapter 2 Parts 2 and 3, so that consumption levels

outperformed previous expectations and econometric models developed in the immediate aftermath of the crisis, when data suggested such provisions (Jaewoo Lee et al, 2010).

The United Kingdom

Chart 12. Final consumption expenditure, United Kingdom.

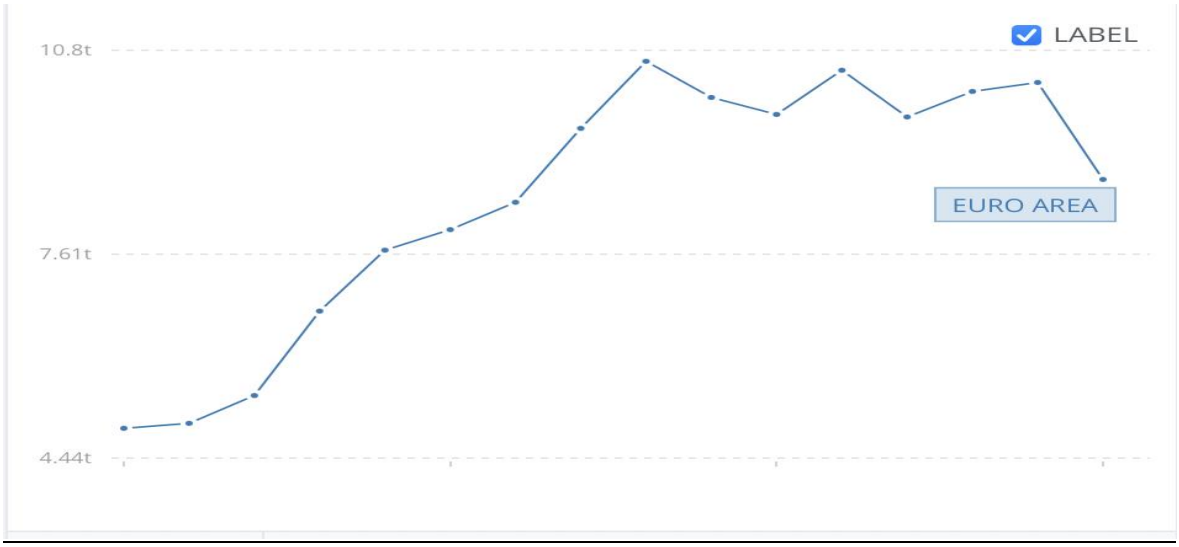


Source: World Bank national accounts data
Note: Data are in GBP for the 2000-2015 period.

As the Chart shows, consumption level's trend slowed in 2008 as the effects of the crisis were travelling east from the United States towards Europe.
A very interesting analysis proposed in a working paper for the Bank of England Philipp Bunn and May Rostom, noted how more highly indebted households – there had been a notable consumer credit expansion in the previous years from 2002 onwards – made larger cuts in spending following the financial crisis. These cuts may have contributed to the reduction of 2% of consumption after 2007 and may reflect tighter credit conditions and increased concerns about ability to meet future payments.

As Karen Dynan wrote in her 2012's paper "Household Debt Overhang Holding Back Consumption?", there is strong evidence for high levels of household debt to be one of the main causes for consumption reduction after the financial crisis in the US (K. Dynan et al, 2012).
Similar remarks can be found in conventional consumption theory, as in Fisher's "debt inflation theory", where he argued that high levels of debt helped to amplify and propagate the initial shock through the economy. This theory was then used to explain the 1990s weak consumption in the UK, as the model proposed by Mervyn King in his 1994 paper analyzed how indebted households had borrowed on the expectation of future income rise, and adverse shocks to their expectations led them to consume less to repay debt. Even if a share of households experienced positive shocks their increased consumption couldn't match the overall trend and not fully offset the effects on aggregate spending (M. King, 1994).
In the UK, in fact, major developments of households' balance sheets from 1992 to 2007 brought household debt from £500 billion in 1992 to £ 1.5 trillion in 2007, primarily caused by a rise in mortgage debt, which, at the eve of the crisis accounted for three quarters of all households' debt, with effect like the ones described by King (P. Bunn et M Rostom, 2015)

Chart 13. Final consumption expenditure, Euro Area.



Source: World Bank accounts data and OECD National Accounts data.

Notes: Data are in EUR, ranging in the 2000-2015 period.

Euro Area consumption levels experienced a strong halt, which slowed the previous positive trend and never fully recovered from the 2008 shock, since the chart shows data from 2011-2015 too, displaying also the consequences of the sovereign debt crisis, which will be discussed further in following paragraphs.

Euro Area seems to be particularly subject to the "Confidence Channel" (S. Dees et P. S. Brinca, 2013), linked to the international transmission of shocks from the United States, together with a worse economic outlook, depending on multiple factors. Those years were in fact, characterized by fears over a possible "euro-break-up", that is, the fragmentation of the European common currency caused by political instability between core/surplus countries and peripheral/deficit countries, with the Greek case being an emblematic example (B. Lucarelli, 2012).

In particular, the significant contraction in output was followed by an anomalous fall in private investment and an increase in households' saving, another component of the drop observable in chart x, while unemployment fell together with GDP. Also, households' debt rose as the public deficit/GDP ratios and debt/GDP ratios, abnormally rising beyond pre-crisis trends, mainly due to the extraordinary measures carried out to support the financial sector, with strong fiscal consolidation policies following soon after and consumption levels stagnating (A. Caruso et al, 2019).

The European sovereign debt crisis.

The sovereign debt crisis in Europe was both a consequence of the 2008 crisis' effects and of some structural problem at the heart of the European monetary union. There was no banking and fiscal union, as in the "dollar union" and national currency devaluations, a traditional yet often abused adjustment mechanism was no longer an option in the EMU.

The original design of the euro area included the Stability and Growth Pact and a "no bail out clause", to address possible free-rider problems, deriving from national governments being able to borrow excessively in a common currency with lower interest rates. Financial regulation and fiscal policy remained a national matter, so that governments would continue to carry the direct and indirect fiscal costs of a banking crisis.

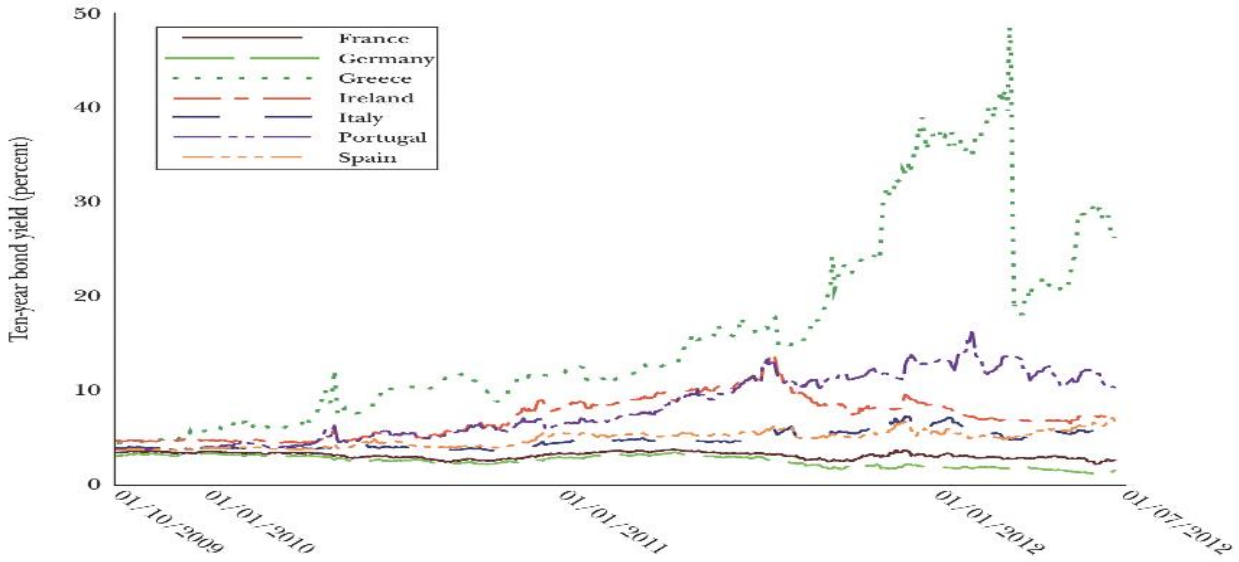
The crisis can, all this considered, be broken into three different crises, a banking crisis caused by bank's undercapitalization and liquidity problems, a sovereign debt crisis with many countries

facing rising bond yields and difficulties in funding themselves and a growth crisis (Shambaugh, 2012).

The global financial shock in 2008 reassessed asset prices and growth prospects, making investors repatriate their funds to home markets, drying up external financial flows, vital to the banking industry in many European countries depending on short term international funding (Merler and Pisani Ferri, 2012). At the end of 2009 some European countries reported a larger deficit/GDP ratio than expected, particularly Greece, where previous years' fiscal accounts were revised too, showing more consistent deficits.

These developments made investors anxious, as the belief that the fiscal costs associated with a medium sized banking crisis could be handled by each state public finances started crumbling. This resulted in a spike in spread in sovereign bonds' yields, that, in a monetary union, reflects volatility and perceived risk associated with the country.

Chart 14. Yields on Ten-Year Sovereign Bonds, October 2009 to June 2012.



Source: ECB data sets.
Notes: Data are expressed in percentage.

Governments of many peripheral states had now problems financing themselves and were relying on funding via IMF protocols, with the ECB cooperation and the EU's support to raise the required capital, far beyond the usual size of IMF loans. Soon, it was clear that Greece was the epicenter of the financial and economic crisis, as after the first bail out, directed mainly to the

banking sector, a second one followed in March 2012. The financial crisis became and economic crisis and a political one too, as the loans conceded to the Greek state came with many unpopular conditionalities, such as job's market reforms, more fiscal pressure and new austerity measures which worsened the country's economy. The Greek crisis could not use currency devaluation to ameliorate austerity condition, so the IMF favored an "internal devaluation", based on wage reductions and, even though the IMF insisted on debt restructuring since 2010, Eurozone lenders refused debt relief (Costas Lapavitsas, 2018). The crisis eventually led to fear of a possible Greek default that could have been the trigger for the fall of the EMU, and this partially led to the third Greek bail out in 2015, when economic conditions had not been improving, and public debt sustainability was at risk.

At the beginning of 2016, six years after adopting bailout policies, the Greek economy started to get better and gained some stability, assessing the gap in competitiveness mainly via nominal and real wages reduction in the 2010/13 span. The crisis created new institutions, such as the European Stability Mechanism, or ESM, to deal with future balances crises, but also seriously deteriorate the public image and trust of the pre-existing European institutions, for some inappropriate moralistic behaviors kept during the crisis' management.

The sovereign debt crisis impact on consumption.

The United States.

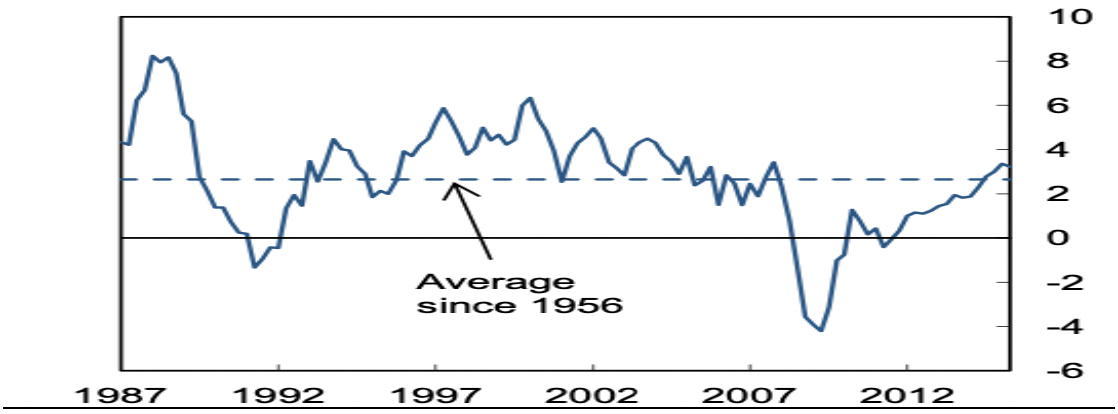
The sovereign debt crisis was a preeminently European crisis, which in Europe can be described as a continuation of the 2008 crisis, the "twin crises", as are often referred to in academic literature on the topic (See J.R Lothian "Monetary Policy and the *twin crises"*).

US consumption levels were not particularly affected by the debt crises in Europe, as they could have been if the possibility of Greece and other peripheral state's default were to become a reality. In that case, contagion through financial markets could have been inevitable and potentially disruptive.

It makes more sense than to study the effects on Europe, particularly Euro Area countries and the United Kingdom whose economy is deeply intertwined, via finance and trades, with continental Europe.

The United Kingdom.

Chart 15. UK Household spending, Percentage *change on a year earlier*



Source, P. Bunn, 2015 on ONS data sets.

As shown in chart from the analysis conducted by Philip Bunn and May Rostom on 2015, households' consumption in the UK did not receive negative influence from the sovereign debt crisis in Europe, as the country was still recovering from the post-2008 crisis consequences, actual consumption started rising and came back above the average sine 1956 in 2014, as Income and other macroeconomic indicators were coming back to better values.

Euro Area countries.

Early tensions in the sovereign debt markets had distorted monetary and credit conditions, making the monetary policy transmission mechanism of the ECB less effective, raising the cost of loans to households and non-financial corporations. Financial strains spread rapidly from Greece, after the originally concealed budget deficits were revealed, to Ireland, that suffered the consequences of a deep banking crisis and to Portugal, penalized by balance-of-trade deficit. The financial distress then acquired systemic proportions when the Spanish and the Italian government bonds interest rates registered abnormal values and banks problems with wholesale funding worsened credit conditions (S. Neri, 2013).

Credit constraints, i.e., the impossibility for households to borrow against future income, can and did influence households' consumption, and are relevant, as already stated, since they effect monetary policy transmission mechanism.

Marginal propensity to consume slightly decreased as a cause of more credit constraints (B. Garbinti et al, 2020) and uncertainties on the future of the monetary union. Consumption levels however, had a slightly more pronounced decrease when the robust fiscal measures to counteract the financial instabilities transitioned to proper austerity measures.

European Countries that cut spending between 2010 and 2014 experienced a decline in nominal wages, a. real exchange rate depreciation, a fall in the relative prices of non-tradables, achieving an internal devaluation but it was not the case for the countries who imposed consumption taxes. These internal devaluations were desirable as countries in a currency union, unable to perform nominal exchange rate devaluation, could obtain the same competitiveness benefits via austerity policies, "exporting their way out of the crisis" (L. Lambertini, 2019).

In comparison to a drop of 4.6% in GDP in 2009, the impact on consumption was less marked falling by 1.8% in the same year, considering the euro area as a whole.

Actual countries experienced different levels of consumption reduction or growth, the deepest decline of which hit Greece in 2011, with losses between 12% and 15%, Romania, Hungary, Bulgaria, Ireland and Poland actual individual consumption fell by between 5% and 9%, while it expanded between 5% and 8% in Luxembourg (C. Gerstberger, 2013).

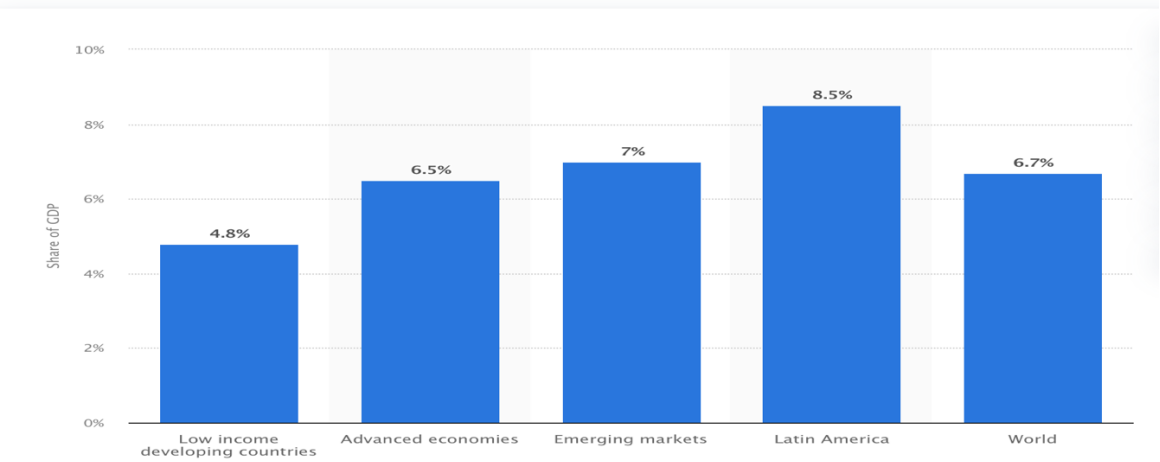
The covid -19 Crisis.

At the end of 2019 in the Wuhan prefecture of China were registered the first patients of the Coronavirus Pandemic that soon reached and affected, with different intensity levels, every country in the world.

As countries adopted strict measures to contain the virus 'outbreak, factories in China were closed after the quarantine policy implemented by the Chinese government locked down workers, also, commercial traffic was almost completely shut down. This led to a shortage of Chinese manufactured pharmaceutical products, semi-finished materials and goods, effectively slowing down the international supply chain and sometimes almost disrupting, as for the tech industry, whose productive processes are highly concentrated in the Shenzhen Province in China.

Output growth around the world stopped after major industries, trade and tourism slowed down, as the sanitary crisis became and economic one.

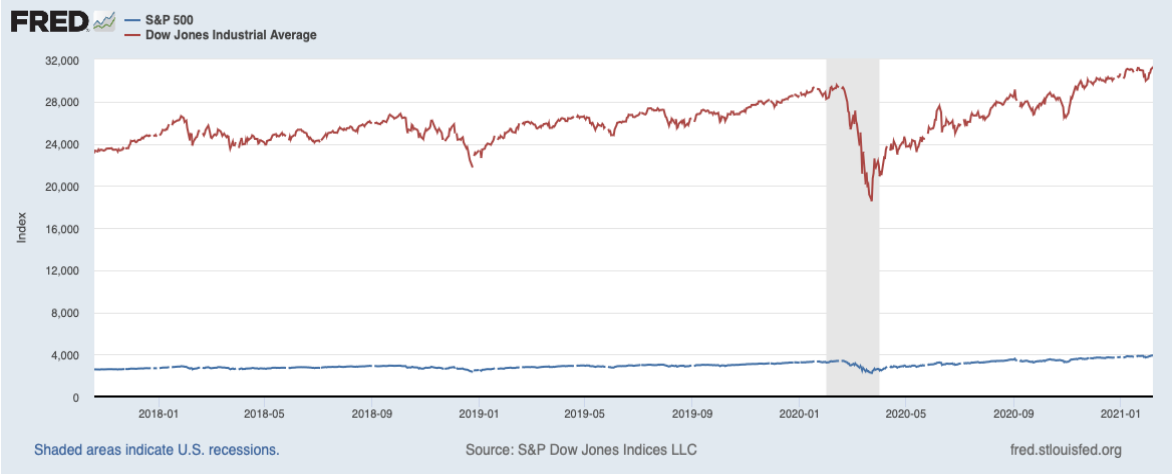
Chart 16. Share of GDP lost as a result of Covid-19 crisis:



Source: Statista.com

The coronavirus crisis' impact on the economy varies for each industrial sector and firm according to many factors, as the possibility to adapt to problems affecting international supply chains, raw materials stock availability or how much the production system inclines towards a just-in-time model.

Chart 17. S&P 500 and Dow Jones industrial Average indexes.



Source: Fred.stlouisfed.org

The Us stock market reacted badly, but quickly regained strength after positive vaccine news and expansionary monetary and fiscal policies were announced.

Covid-19 impact on consumption.

The United States.

Consumption comprised 70% of US GDP in 2019, and, although consumption is generally more stable than income, the Covid-19 crisis is a significant exception, partly because, beyond the shocks to supply, a significant shock comes from disruption of consumption itself. After that, an unprecedented rise in unemployment level, a fall in asset prices and a sharp contraction in credit availability contributed to bring down US real consumer consumption approximately of 20% (J. Muellbauer, 2020).

As the number of Covid-19 cases grew, households across the US altered their typical spending of major categories. At the very first beginning spending increased notably in retail, credit card and food items, as the fear for the disease shook the consumer population, causing consumers to empty supermarket shelves to stock-pile durable goods. This first consumption spike was followed by a sharp decrease, especially in restaurants and retail, businesses most hit by social distancing and quarantine (S. R. Baker, 2020).

More precisely, household spending increase by approximately 50% between February 26th and March 11, with grocery spending had a 7.5% increase compared to the last year levels and credit card spending increase as much (S. R. Baker, 2020).

After the vaccinations numbers started rising and fiscal and monetary policies were implemented however, Consumption level decrease halted and expectations moderately positive, as further discussed in Chapter 2 Par. 2.

The United Kingdom.

Following the crisis there have been notable effects on income and consumption in the UK economy, as households saving ratio rose bringing an increase of £186.1 billion in currency and deposits held by households in 2020 as the Coronavirus Job Retention Scheme and the Self Employment Income Support Scheme protected household income from falling, although microdata shows that high and middle income households are more likely to have seen a raise in savings, and are therefore driving up the saving ratio, while low income, unemployed households are more likely to have witnessed a decrease (Sumit Dey-Chowdhury, 2021).

A sharp decrease in financial consumption expenditure of 21.6% in the second quarter of 2020 reflected measures of social distancing, as mainly "social consumption" was hurt the most, with expenditures on restaurants and hotels dropping 88.4%, recreation and culture -17.7% and expenditure on transport -59.1%, compared to previous year's same quarter. These numbers are more impactful when compared to the lowest downturn for consumption after the 2008 crisis, the -4.1% (Sumit Dey-Chowdhury, 2021).

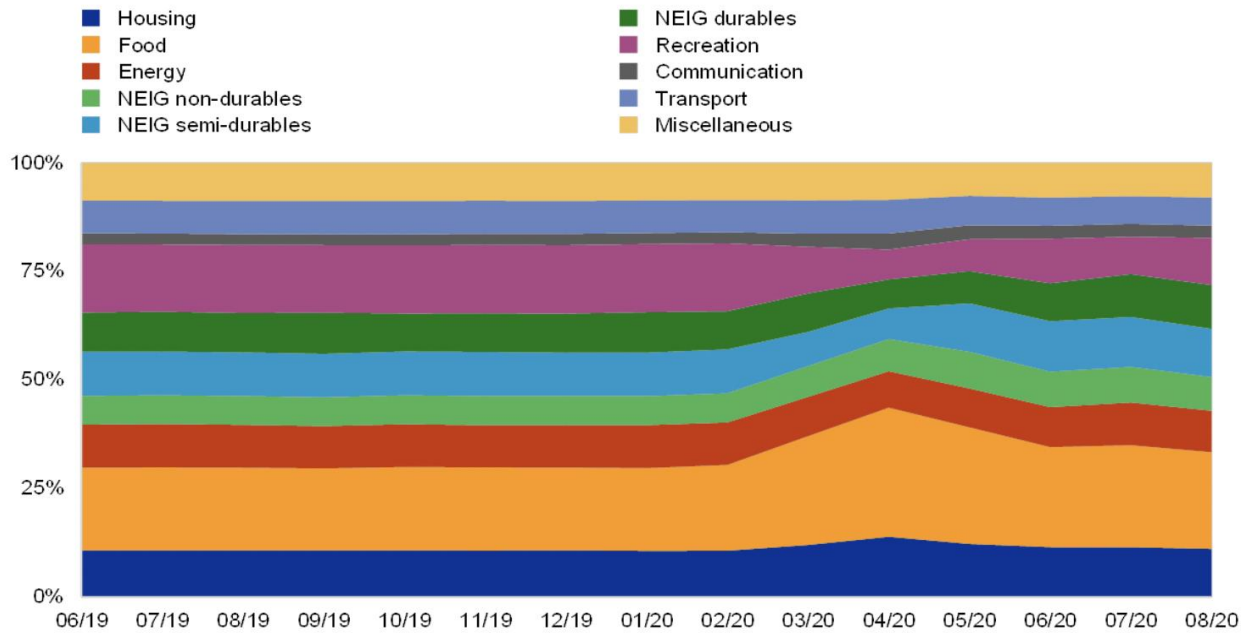
As in the US, the initial rise in online shopping and groceries hoarding reverted, while consumption and income inequality have surged, as did the share of borrowers facing liquidity constraints deriving from difficulties in obtaining financing for both secured and unsecured lending (S. Hacioglu et al, 2020).

Euro Area.

The coronavirus pandemic change consumption patterns in Euro area countries, mainly regarding difference in spending across product categories. In particular, the pandemic led to a large increase in consumption of food and communication services and sharp reduction in other categories, such as recreational and energy goods (O. Kouvavas et al, 2020).

While many shifts induced by the crisis were temporary, such as semi-durable goods, but some categories show persistent changes from pre-crisis trends, as some forma of restriction to movement and social activities persist.

Chart 20. Shares in households' consumption by category. Euro Area.



Source: O. Kouvavas et al, 2020, on Eurostat data.
Notes: Data are in percentages. "NEIG" stands for "non-energy industrial goods".

The chart, from the ECB Economic Bulletin by O. Kouvavas et al, shows the evolution of estimated relative spending, whose patterns are calculated using HICP weights as a starting point and applying growth rates based on turnover data for the retail trade. Some categories show an increase in March and April because the nominal spending related to them suffered a minor contraction then other categories.
There are three main ways the pandemic influenced spending, raising concerns. Firstly, financial concerns are linked to current income, liquidity access and wealth, so that less wealthy households being less equipped to buffer adverse consequences of the Covid-19 crisis. Then, lower income expectations, related to the possibility for family members to maintain the previous occupation or work remotely due to quarantine. Finally, increased concerns about the future, the duration of the crisis and further Covid-19 waves (D. Christelis 2021).

2.2 Monetary policy response.

To counterbalance the last two crises' effects, monetary policy begun experimenting newer and more creative approaches to reach the sought expansionary goals. Focusing on the 2008 crisis first, different Central Banks reacted differently to the crash, due to differences in their long run objective targets. The Federal Reserve Act states "The Board of Governors of the Federal Reserve System and the Federal Open Market Committee shall maintain long run growth of the monetary and credit aggregates commensurate with the economy's long run potential to increase production, so as to promote effectively the goals of *maximum employment*, *stable prices*, and *moderate long-term interest rates*.". The ECB statute, however, only refers to "…the primary objective of the ESCB shall be to maintain *price stability*.".

The 2008 crisis early "conventional" response to the crisis.

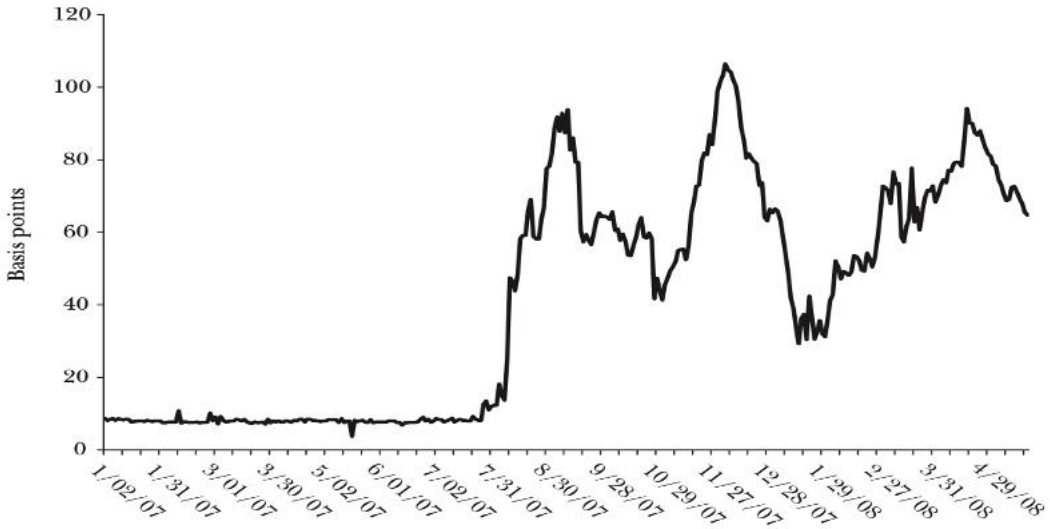
In the early stages of a crisis, central banks should primarily focus on making sure that commercial banks have the necessary liquidity to conduct their daily business and make timely payments and transfers, even more so in the Us, where the total credit outstanding in the economy consisted of approximately $50 trillion.

In late 2007, the Fed provided short-term funding liquidity by buying banks' holdings of Treasury security, but although effective, it was soon clear that traditional central banks tools would not have been enough.

After BNP Paribas halted redemptions from three of its funds because it couldn't value certainly the assets backed by U.S. subprime mortgage debt, the interbank lending market dried up immediately with interbank rates rising steadily, from higher perceived credit risk and banks unable to lend due to uncertainties and constraints regarding their balance sheets (S. Cecchetti, 2009).

Short-term funds supply reduction caused overnight interest rates in Europe to shoot up, and the ECB responded with a short-term liquidity injection 94.8 billion euros worth of overnight repos. The stress in the interbank lending market can be seen by the sudden rise in the LIBOR values in the chart below.

Chart 21. Spread between 3-month Libor and 3 month expected federal funds rate.



Source: Data sets from the British Bankers' Association.

Notes: Values represented are from January 2007 to May 2008, daily.

As credit risk was still high the FED reduced the premium on primary landing from 100 to 50 and then 25 basis points above the federal funds rate and an increase in lending time, from overnight to 30 and 90 days. The Term Auction Facility (TAF), and the Primary Dealer Credit Facility (PDCF) and Term Securities Lending Facility (TSLF), were introduced to keep up the short-term lending supply, along with the extension of a $62 billion credit line with the European Central Bank and the Swiss Central Bank. More precisely, the TFA were used to auction funds to banks in need while preserving their anonymity to avoid showing their excessive financial distress (Armantier, Kreiger and McAndrews, 2008), while the TSLF were introduced in early 2008 to supply dealers with U.S. Treasury securities that were disappearing from the markets after a general flight to quality.

It was on March 14, 2008, that monetary policy took a turn, when the Federal Reserve Bank of New York made a $12.9 billion loan to Bear Sterns, a bank normally not eligible for one, since it was not a commercial bank. Fed officials decided to invoke the article 13, that allows the FED

to fund anyone or anything unable to obtain funding via other means, since they were concerned about the lack of liquidity in the market, therefore unable to absorb the $400 billion assets held by the firm in case of a dismissal sale.

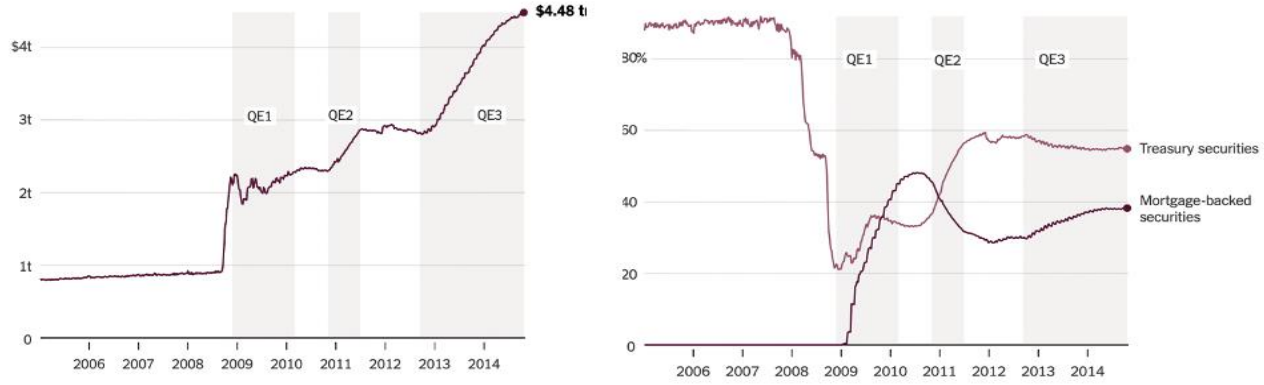
Then on March 16, article 13 was invoked again to create the Primary Dealer Credit Facility, to supply short-term credit in exchange of a large variety of collateral such as "investment-grade corporate securities, municipal securities, mortgage-backed securities and asset- backed securities for which a price is available", with the idea to "institutionalize" loans to Investment Banks, without another Bear Sterns case.

When circumstances led to the eventual failure of Lehman Brothers however, the Fed denied them access to credit twice, either for insufficient collateral and lack of legal authority or for a more political necessity (as argued in L. Ball, 2016, sections 13-14), which worsened financial distress and an even more afraid market.

Towards a more unconventional approach.

Short on tools, the Fed went on to try an innovative one, already adopted by the BOJ in the 90's, with the first round of QE, also later called QE1, in November 2008, when it proposed to buy ~$100 billions of agency debt and ~$500 billion of mortgage-backed securities. The first round was then extended in March 2009, when the Fed used another $850 billion to purchase mortgage-backed securities and debt, and again in 2011 and 2012, with similar sums. Assets purchase programs, or Quantitative Easing, a still debated monetary tool, succeeded in providing an expansionary force at the zero lower bound the Fed had already touched (Joseph E. Gagnon, 2016) and was to be followed soon by other central banks, like the Bank of England, which followed by purchasing £200 billions of assets, between March 2009 and January 2010.

Chart 22. Total Assets held by the Federal Reserve. Chart 23. Percentage of assets held by the Fed.



Source: Federal Reserve Data.

The process was repeated, as shown in the charts, in particular Chart 22, the totality of assets held by the Fed is confronted with chart 23 where the composition of these assets portfolios held is shown.

The ECB's more cautious approach.

According to its more restrictive 2% inflation target the ECB decided to avoid Assets Purchase Programs, sticking to smaller securities purchases, mainly private bonds. At the end of 2011, at the dawn of the sovereign debt crisis, the ECB begun offering Long Term Refinancing Operations, or LTROs, in two single auctions for commercial banks -the first in December 2011 and the second in February 2012, for a total of approximately 1.019 billion euros (ECB's Datasets)- avoiding a possible crisis in banking liquidity in the eurozone.

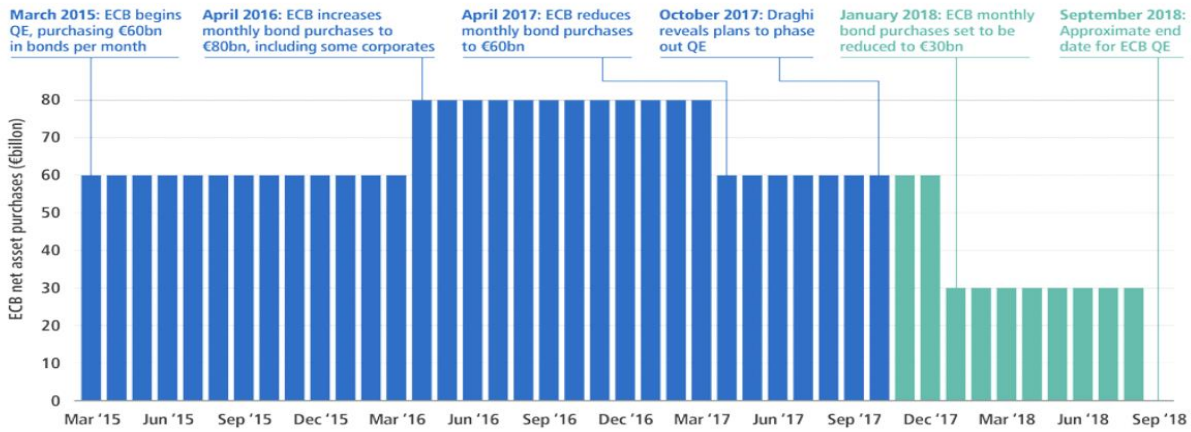
As stagnation persisted, the ECB opted for the TLTRO, Targeted Long Term Refinancing Operation, in 2014, targeted as the purchase program was offered to commercial banks more prone to conceding credit for firms' investments.

The ECB and the Euro system, for example, confronted the problem of lack of liquidity for Greek Banks through LTROs and other facilities, such as the Emergency Liquidity Assistance, and Trans-European Automated Real-time Gross Settlement Express Transfer System (TARGET2). The dangerous link between a worsening current account and an ensuing lack of domestic liquidity was thus broken (Pisani-Ferry, Sapir, and Wolff 2013).

The action was followed by the announcement of a European Quantitative Easing in early 2015, with the ECB would buy 60 billion euros in eurozone sovereign debt securities and private bonds in the secondary market, with an instantaneous alleviating effect on yield's spreads across the eurozone.

The ECB's Board agreed to extend Qe multiple times, reducing from 60 billion euros to 30 billion of assets purchased in early 2017 and then 15 billion in June 2018.

Figure 1. ECB's Assets Purchase Program, visualized.

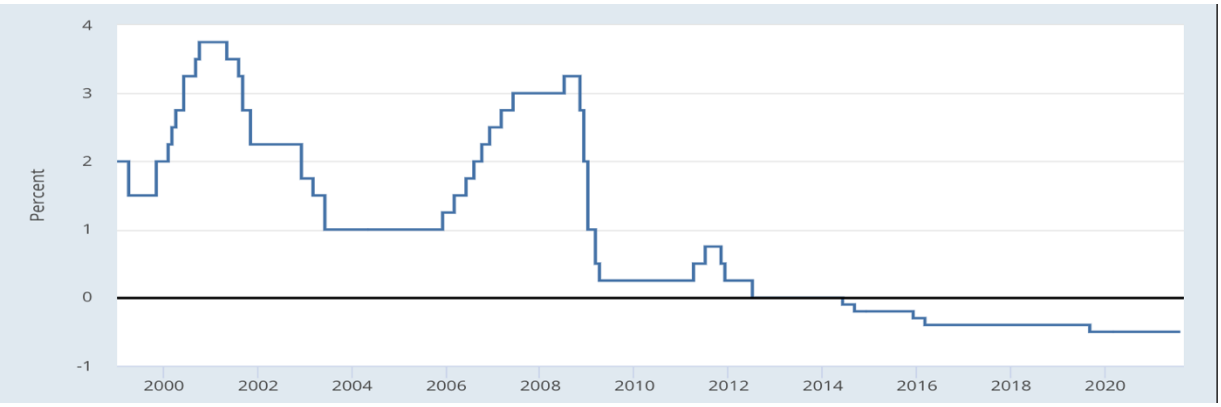


Source Global.pimco.charts.com on ECB's Data sets

Figure 1 clarifies both the chronological order and the raw numbers for the European assets purchase program, the unconventional monetary policy "tool" the ECB board decided to adopt to counteract deflationary pressure and possibly to limit speculation on peripheral government bonds, to assert the irreversibility of the euro.

The ECB also chose to cut Deposit Facility Rate for Euro Area below 0% in June 2014, breaking the "Zero Lower Bound" as Denmark, Switzerland, Sweden and japan did.

Chart 24. ECB Deposit Facility Rate.



Source: tradingeconomics.com

Negative interest rates, considered a momentaneous exception, became the norm for many countries although concerns arose as negative interest rate policies may cause excessive cash hoarding, reduce bank profitability by eroding the interest rate income, or could originate asset price bubbles and weaken the yield on pension savings.

The Pandemic

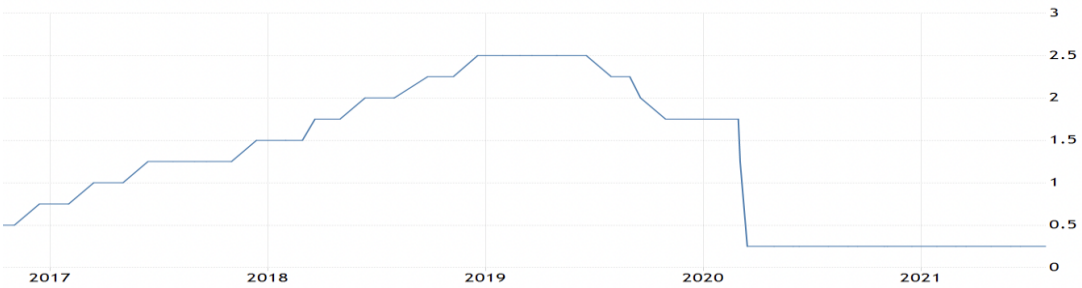
To confront the risks to the monetary policy transmission mechanism and the outlook for the euro area deriving from the Covid-19 outbreak the ECB firstly introduced a non-standard monetary policy measure, the 120 billion euros PSPP, a program dedicated to sovereign bonds purchasing and then resorted to the Pandemic Emergency Purchase Program, basically a form of QE.

The PEPP new total, after increases decided by the ECB's Board, amounts to 1850 billion euros, will accept lower quality bonds and commercial papers and will not terminate until the Covid-19 crisis will be over, and in any case not before March 2022. This measure, together with new LTROs' and PELTROs' (Pandemic Emergency LTRO) auction will ensure liquidity in the markets and the banking sector (Banca d'Italia).

Other Central Banks have reacted similarly but focused on interest rates' cuts, a more difficult option for the ECB, whose MRO is at zero and deposit facility already in negative territory at -0.5%.

The FED cut interest rates twice since March 2020, bringing the Federal Funds Rate to 0,25%, followed by a liquidity injection via a Lending Facility of approximately $1500 billion to ensure market's proper functioning, and announced a QE program of $700 billion.

Chart 25. Fed's fund rate:

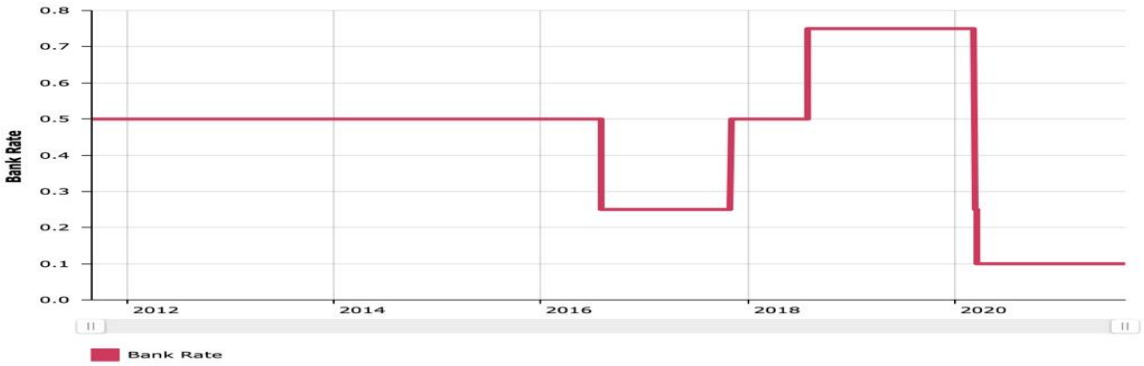


Source: tradingeconomics.com on Federal Reserve's Data

The BoE followed cutting the base rates, or "bank rate", from 0.75% to 0.25%, and soon after 0.10% and announcing a refinancing program directed to small and medium firms to sustain the

national economy, given the “deteriorated risk propension and growth prospective” (BoE bulletin).

Chart 26. BoE’s bank rate:



Source: bankofengland.co.uk

2.3 Impact on Consumer Credit.

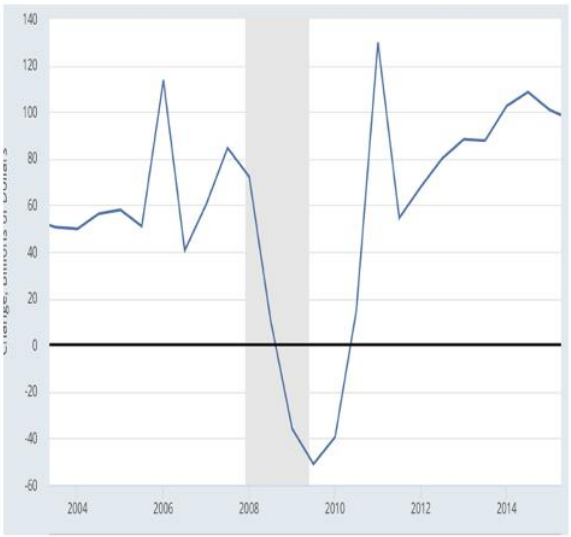
The 2008 Crisis, Quantitative Easing and Negative Interest Rates.

The American housing market had collapsed after the 2008 Recession, as did consumer The massive assets purchases led by the Federal Reserve Board surely helped lowering the interest rates, not only on Corporate Bonds, but also on mortgage rates, with a relieving effect on the housing market and allowing consumers to borrow again, with positive expansionary. On the first following chart is the average corporate bond and mortgage rates compared to QE1, QE2 and QE3 while on second is the percent change in Consumer Credit growth, semi annualized, for the same years in billion off US dollars.

Chart 27. QE on Corp. et Mort. rate, US.

Source: Moody's, Freddie Mac, NYT Calculations.

Chart 28. Consumer credit growth, US.



Source: fred.stlouisfed.org

Notes: data are in percentage change on the previous year.

Comparing Chart 27 and 28 it is possible to appreciate the effectiveness of QE in reducing interest rates, for firms and households, and the effects on consumer credit growth, where the renewed confidence and the lower interest rates, together with the liquidity injected via assets purchase program, alleviated liquidity constraints allowing households and consumer to borrow again.

The sovereign debt crisis.

Greece Consumer Credit never fully recovered, although the decline can be seen also a realignment to the country's most plausible numbers, after the great credit expansion prior to the fiscal crisis. Consumer confidence remains equally low and banks will to lend did not increase significantly. Euro Area's Consumer Credit where all effected and recovery begun only after QE was announced and Deposit Facility Rate went negative, showing great effectiveness.

Chart 29. Total Consumer Credit Greece.

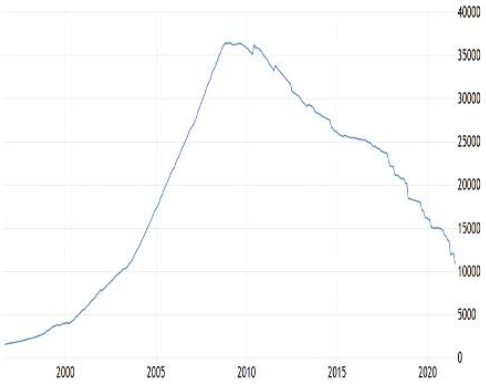


Chart 30. Euro Area Consumer Credit.

Source: tradingeconomics.com on ECB Data.
Note: Data are expressed in EUR millions.

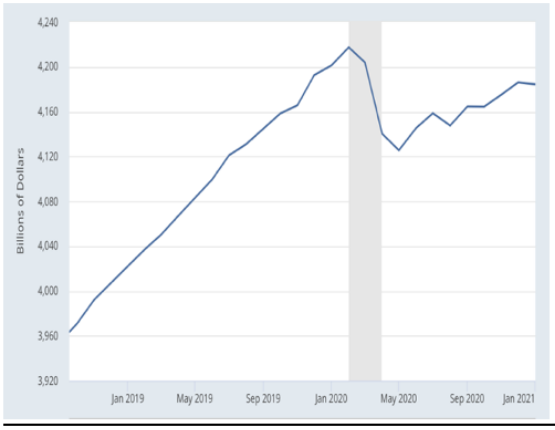
Chart 29 clearly displays how even unconventional monetary policy could not alleviate low liquidity in the markets and liquidity constraints on Greek consumers, this being a more general European problem, as shown in Chart 30.

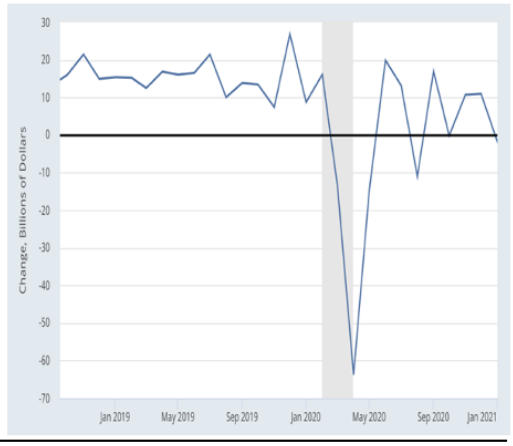
Covid-19 and the Pandemic.

The Covid Crisis caused a drop in Consumer Credit in the US given lower levels of consumer confidence and less investment decisions by households. The expansionary monetary policies implemented worked again, especially the announcement of a $700 billion, together with expansionary fiscal policies, helped better economic outlook on the future, raising confidence and inflationary expectations. The levels of Consumer Credit, a good sign for the overall economy, show this positive trend.

Chart 31. US consumer credit total aggregate.

Chart 32. US consumer credit percent change.





Source: fred.stlouisfed.org

Note: Values in Chart 31 are in billion US$ and refers to total outstanding consumer credit owned.

Euro Area Consumer Credit, first plotted in a bar chart, then in a line chart, with millions of euros in the y axis. The impact of the crisis is clear in the sudden drop observable after March 2021, when major European countries started implementing lockdowns and free movement restrictions, but expansionary monetary and fiscal policy soon made a recovery possible, keeping the positive growing trend, as displayed below.

Chart 33. Euro Area total consumer credit.

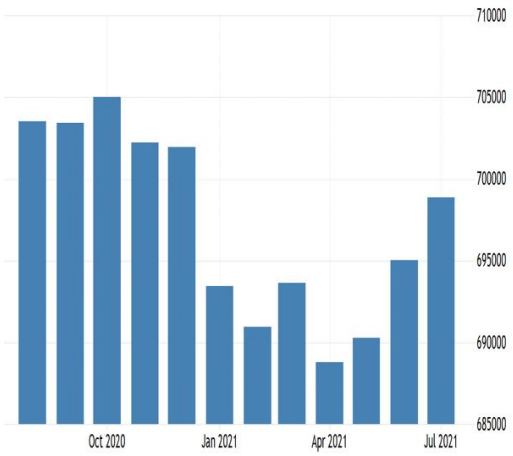
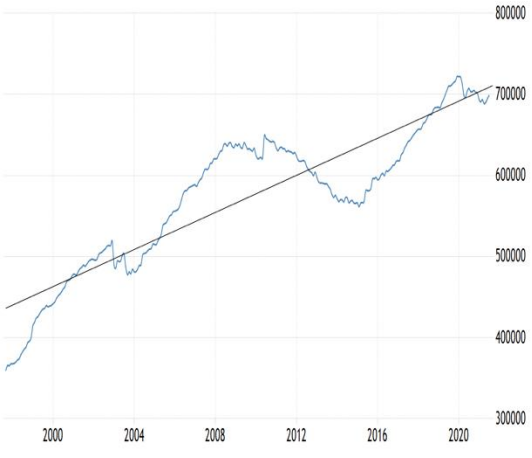


Chart 34. Euro Area total consumer credit and trend.



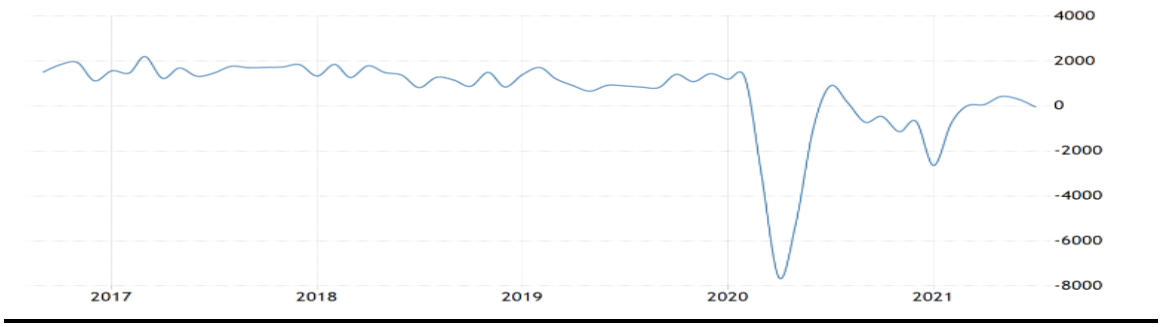
Sources: tradingeconomics.com on ECB Data

Note: Same data are used for chart x and chart x, although the first is plotted in a bar chart while the second in a linear chart, where the trend is determined via a quadratic regression calculation on each value.

The two charts, both representing the same data, allow for a better understanding of the volumes of consumer credit, as displayed in the bar chart version, where the impact of the crisis is clear after January 2021. The line chart, on the other hand, suggest that although the credit expansion halted, the overall trend remain positive for Euro area countries.

Similar trends and observation could be made for UK's Consumer Credit total aggregate.

Chart 35. Consumer Credit aggregate, United Kingdom.



Source: tradingeconomics.com calculation on BOE Data sets.

Chart 35 clearly shows the sharp decline in Consumer Credit following the rising uncertainties tied to the Covid-19 Pandemic, although the "V" shaped level suggests a strong bounce back, thanks to an expansionary monetary policy and vaccine announcement and first rollouts, together responsible for an improved economic outlook.

Conclusions.

Households' consumption level is still a key indicator of population well-being and an important determinant of standard of living. As the United States, the United Kingdom and the Euro Area went through structural developments, changes in income for households working hours rose, as did the demand for consumer credit, both ways to keep the consumption level intact even in presence of lower nominal wages.

By looking at the main crises form the last twenty years in the western world, it was clear that protecting consumer expenditure was not only necessary to preserve economic stability of families and households, but also to maintain monetary policy transmission mechanism working properly given the relevancy of credit channels for monetary policy transmission and the relevant share of credit comprised of consumer credit.

In this regard, Central banks forward guidance remains a crucial aspect to maintain a strong level of confidence in the markets, with a double effect of keeping economic outlook positive both for the borrowers as for the lenders, as to alleviate credit and liquidity constraints and smooth unexpected shocks to income and consumption.

Having considered these aspects, in an extreme synthesis of this thesis, one could argue, mimicking the schematic by the cited paper by Mishkin:

(13) Expansionary monetary policy => interest rates ↓ => credit cost ↓ + improved economic outlook + consumer confidence ↑ + perceived risks ↓ => consumer credit ↑ => consumption ↑ => Y ↑

Bibliography.

- *Banca D'Italia, https://www.bancaditalia.it/ .*
- Bank of England Bulletin, www.bankofengland.co.uk .
- Ball L., "The Fed and the Lehman Brothers." John Hopkins University, July 2016 https://back.nber.org/appendix/w22410/The%20Fed%20and%20Lehman%20Brothers.pdf.
- Baker, R.S., Farrokhnia, R.A., Meyer, S., Pagel, M. and Constantine, Y. (2020), "How Does Household Spending Respond to an Epidemic? Consumption During the 2020 COVID-19 Pandemic", Covid Economics, No 18, pp. 73-108**.**
- Bernanke B. *"Some reflections on the crisis and the policy response*". Speech as Chairman of the Board of Governors of the Federal Reserve System, at the Russell Sage Foundation and The Century Foundation Conference on *"Rethinking Finance",* New York, 13 April 2012 https://www.bis.org/review/r120416b.pdf.
- Blanchard O. et Milesi-Ferretti G.M. "Global imbalances: past, present and future". International Monetary Fund research department, 2015.
- Blundell R. "Consumer Behavior: theory and empirical evidence – a survey", The Economic Journal, 98, March 1988, Pages 16-65.
- Borio C. and Disyatat P. "Unconventional monetary policy: an appraisal", Monetary and Economic Department, BIS working papers, https://www.bis.org/publ/work292.pdf?source=content_type%3Areact%7Cfirst_level_url%3Aarticle%7Csection%3Amain_content%7Cbutton%3Abody_link .
- Brewer M. et Tasseva I. V. "Did the UK policy response to Covid-19 protect household incomes?", The Journal of Economic Inequality, August 2021.
- Browning et Callado 2001, "The response of expenditures to anticipated income changes: Panel Data Estimates" AER, vol.91.
- Caruso A., Reichlin L. et Ricco G. "Financial and fiscal interaction in the Euro Area crisis: This time was different", European Economic Review, Volume 119, October 2019, pages 333-355.

- Cecchetti S. G., Crisis and Responses: The Federal Reserve in the Early Stages of the Financial Crisis, *Journal of Economic Perspectives—Volume 23, Number 1—Winter 2009—Pages 51–75* https://pubs.aeaweb.org/doi/pdfplus/10.1257/jep.23.1.51 .
- Christelis D., Georarakos D., Jappelli T. et Kenny G. "How has the Covid-19 crisis affected different households' consumption in the euro area?", ECB Research Bulletin No. 84, 2021.
- *CONSOB, commissione nazionale per le società e la borsa,* https://www.consob.it/web/consob/home.
- Coricelli F. et al, (2006) "Household Credit in The New Europe: Lending Boom Or Sustainable Growth", Institutions and economic performance and International Macroeconomics, https://repec.cepr.org/repec/cpr/ceprdp/DP5520.pdf.
- Davis G., "The many ways COVID-19 affects households: consumption, time, and health outcomes", Review of Economics of the Household, Vol. 19, Pages 281-289, 2021.
- Dees S. et Brinca P. S. "Consumer confidence as a predictor of consumption spending: Evidence for the United States and the Euro area", International Economics 134, 2013, 1-14.
- Dey-Chowdhury S. "Coronavirus and the Impact on UK households and businesses: 2020", Office for National Statistics, 2021, https://www.ons.gov.uk/economy/nationalaccounts/uksectoraccounts/articles/coronavirusandtheimpactonukhouseholdsandbusinesses/2020.
- Di Cesare A., Grande G., Manna M. et Tabog M. "Recent estimates of sovereign risk premia for euro-area countries" The sovereign debt crisis and the euro area, Workshops and Conferences, Banca d'Italia, May 2013.
- Dynan K., Mian A. et Pence K. M. "Is a Household Debt Overhang Holding Back Consumption?", Brookings Papers in Economic Activity, Spring 2012, Pages 299-362.
- Duesenberry, J. S. 1949. "*Income, Saving, and the Theory of Consumption Behavior*." Cambridge, Mass.: Harvard University Press.
- *EBA, European Banking Authority,* https://www.eba.europa.eu/ .
- *ECB, European Central Bank,* https://www.ecb.europa.eu/ecb/html/index.it.html .
- Eurostat, www.ec.europa.eu.
- Fleming M. J. "Federal reserve liquidity provision during the financial crisis of 2007-2009", https://www.econstor.eu/bitstream/10419/60869/1/72024367X.pdf.
- Fitoussi J.-P., Stiglitz J.E. (2009), "The Ways Out of the Crisis and the Building of a More Cohesive World", Document de travail de l'OFCE No. 2009-17, Centre de recherche en économie de Sciences Po.

- Friedman M. 1957, "*A Theory of the Consumption Function*." Princeton, N.J.: Princeton University Press.
- *FSB, Financial Stability Board, https://www.fsb.org/ .*
- Gagnon J. E. "Quantitative Easing: An Underappreciated Success", Peterson Institute for International Economics, April 2016 https://www.piie.com/system/files/documents/pb16-4.pdf.
- Garbinti B., Lamarche P., Lecanu C., Savignac F. "Wealth effect on consumption during the sovereign debt crisis: households' heterogeneity in the euro area", ECB Working Paper, No. 2357, January 2020.
- Gerstberger C. et Yaneva D. "Analysis of EU-27 household final consumption expenditure — Baltic countries and Greece still suffering most from the economic and financial crisis", Eurostat, Statistics in focus, 2/2013.
- Greenlaw D., Hatzius J., Kashyap A. et Song Shin H. "Leveraged Losses: Lessons from the Mortgage Market Meltdown", US Monetary Policy Forum Conference Draft February 29, 2008.
- Hetzel R. L., "Monetary Policy in the 2008-2009 Recession", Economic Quarterly-Volume 95, Number 2-Spring2009-Pages 201-233.
- Johnson, Parker et Souleles 2006, "Household expenditure and the income tax rebates of 2001", Am. Econ. Rev. 96.
- Joyce M., Tong M. et Woods R. "The United Kingdom's quantitative easing policy: design, operation and impact", Bank of England Quarterly Bulletin, Q3 2011, https://www.bankofengland.co.uk/-/media/boe/files/quarterly-bulletin/2011/the-uks-quantitative-easing-policy-design-operation-and-impact.pdf?la=en&hash=62052A70C866C3F52125D98619D2E8BD1E69D3BE.
- King M. "Debt deflation: theory and practice", European Economic Review, Volume 38, Issue 3-4, April 1994, Pages 419 – 445.
- Kouvavas O., Riccardo T., Eiglsperger M., Goldhammer B. et Gonçalves E. "Consumption patterns and inflation measurement issues during the COVID-19 pandemic", ECB Economic Bulletin, Issue 7/2020.
- Keynes J. M. "*The General Theory of Employment, Interest and Money*." New York: Harcourt, Brace, 1936.
- Lee J., Rabanal P. et Sandri D. "US Consumption after the 2008 Crisis" International Monetary Fund research department, 2010.

- Lopes A., "Credito al Consumo, ristrutturazione del sistema bancario e squilibri territoriali in Italia. Alcune Considerazioni critiche". Quaderno n. 12/2007. https://www.economia.unifg.it/sites/sd01/files/allegatiparagrafo/29-11-2016/q122007.pdf.
- Lucarelli B. "The Break-Up of the Eurozone?", Research Articles, Sage Journals.
- Lambertini L. et Proebsting C. "Does Austerity Go Along with Internal Devaluations?", IMF Economic Review, 67, Pages 618-656, 2019.
- Lane P. L. "*The European Sovereign Debt Crisis",* Journal of Economic Perspective- Volume26, Number 3- Summer 2012- Pages 49,68. https://pubs.aeaweb.org/doi/pdfplus/10.1257/jep.26.3.49;
- Lothian JR, "Monetary policy and the twin crises", Journal of International Money and Finance, 2014.
- Milesi-Ferretti et Tille. "The great retrenchment: international capital flows during the global financial crisis", *Economic Policy*, Volume 26, Issue 66, 1 April 2011, Pages 289–346, https://doi.org/10.1111/j.1468-0327.2011.00263.x.
- Modigliani F., and Brumberg R. 1954. "Utility Analysis and the Consumption Function: An Interpretation of Cross-Section Data". In *Post- Keynesian Economics*, edited by K. K. Kurihara. New Brunswick, N.J.: Rutgers University Press.
- Muellbauer J., "The coronavirus pandemic and US consumption", VOX Eu, April 2020.
- Neri S. "The impact of the sovereign debt crisis on bank lending rates in the euro area", The sovereign debt crisis and the euro area, Workshops and Conferences, Banca d'Italia, May 2013.
- *Quarterly report on Household debt and credit*, Federal Reserve of New York, https://www.newyorkfed.org/medialibrary/interactives/householdcredit/data/pdf/hhdc_2021q2.pdf.
- Ross P. et Rostom M. "Household debt and spending in the United Kingdom", Bank of England Working Paper No. 554, October 2015.
- Russo A. et al, (2016), "Increasing Inequality, Consumer Credit and Financial Fragility in an Agent Based Macroeconomic Model", https://u-pad.unimc.it/retrieve/handle/11393/234697/85786/modelloneCCrev2ENG.pdf.
- Shambaugh J. C. *"The Euro's Three Crisis"*, Georgetown University,

  https://www.brookings.edu/wp-content/uploads/2012/03/2012a_Shambaugh.pdf.

- Siwinska A. – Gorzelak, *Micro Foundations, modern theories of consumption*, Warsaw University, http://coin.wne.uw.edu.pl/siwinska/Lecture11_2020.pdf.
- Surico P., Känzig D., et Hacioglu S. "Consumption in the time of Covid-19: Evidence from UK transaction data", Discussion Paper DP14733 Centre for Economic Policy Research, April 2020.
- Variato A., 2009, "La teoria del Consumo", Approfondimenti di Macroeconomia, Università di Bergamo, http://www00.unibg.it/dati/corsi/6448/35295-AppuntiConsumo.pdf.