

# Inflation dynamics: an in-depth historical analysis and future perspectives

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## Abstract

The purpose of this thesis is to analyse the inflationary trends throughout the decades, starting with the Great Inflation of the 1970s and moving to the Great Recession experience, until the recent wave that hit especially Europe in 2021. For each episode taken into exam, this study aims to provide a comprehensive understanding of the causes, impacts, and monetary policy responses. A recurring factor of these different inflationary phases can be considered oil prices, as they determined the two major shocks in the 1970s, which had a profound impact on energy prices; such a linkage between inflation and oil prices reemerged in the most recent crisis, where global supply shocks played a pivotal role. The final section is dedicated to exploring the channels through which the inflationary spikes starting in 2021 have affected household inequality, with a particular focus on Italy; it includes a brief overview of wealth disparity trends over the past two decades and offers reflections and suggestions for addressing these issues in the future, especially in the context of potential future energy shocks.

## Chapter 1: Inflation during the 1970s

### 1.1 Overview and causes

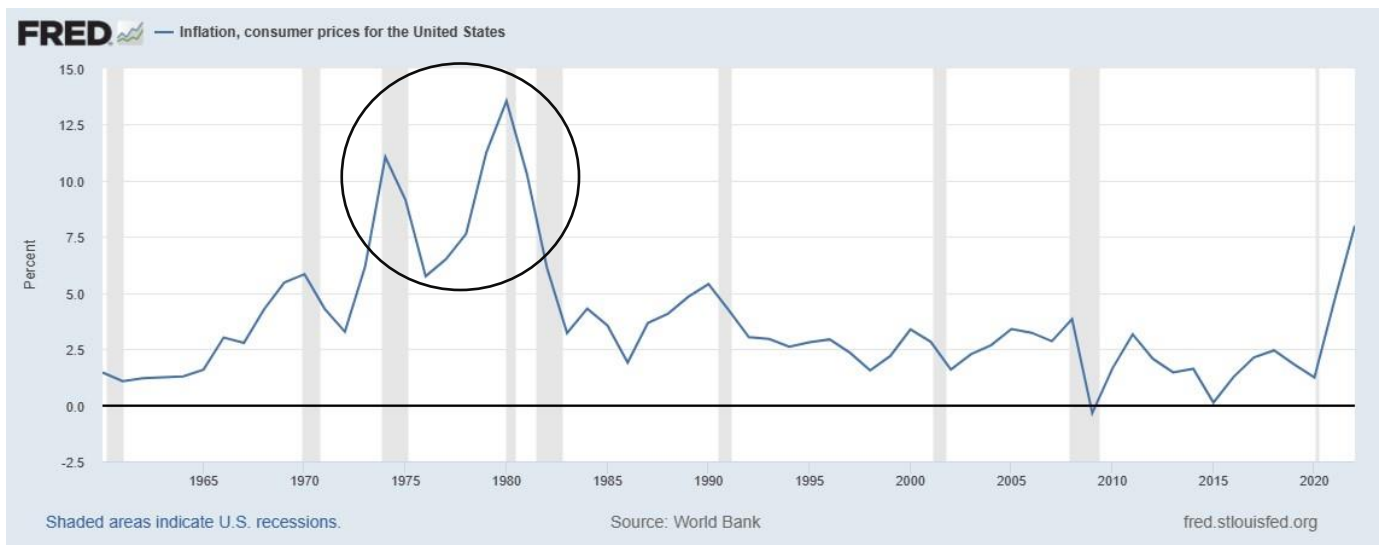


Figure 1 – Inflation, CPI for the United States

During the 1970s, the United States experienced an extremely high level of inflation: although the average inflation rate for the decade was set at 6.8%, such a number is still twice as high as the long-run historical average. The graph above in *Figure 1* allows us to examine the dynamics of inflation, taking a closer look at the period under consideration: starting in early 1965, inflation increased from slightly above 1% to a peak of 6.4% in February 1970. After temporarily decreasing to 2.9% in August 1972 it accelerated again, and in October 1973 it was running at 8.1% and about to increase to a double-digit level soon after: therefore, these data suggest that the US economy was already on a path of instability even before being hit by the oil price shocks. It is prompted so also by several speeches and statements made by Chairmen of the Federal Reserve during the late 1960s and early 1970s: for instance, in March 1967, the Federal Reserve Chairman William Martin declared in front of the Joint Economic Committee (JEC) of the US Congress that the United States had “*an overheated economy, and growing expectations of inflation*” and that inflation, and the widespread expectation of it, was their most serious current economic issue. Furthermore, it is important to note that inflation rates were extremely variable throughout the whole decade, as well as the fact that the prices of certain products rose more rapidly compared to others, thus creating a significant change in relative prices. Later, but still prior to the inflationary peak, in May 1970, the Federal Reserve Chairman Arthur Burns asserted:

*“We are living now in an inflationary climate. [...] In these circumstances, it should not be surprising that many businessmen and consumers believe that inflation is inevitable.”<sup>1</sup>*

Hence, how can this phenomenon be fully comprehended? Which can be considered as its main drivers? It is generally perceived that the Great Inflation of the 1970s was the result of both monetary and non-monetary causes. First and foremost, we have to distinguish between two separate moments of the decade: a first peak of inflation – between 1973 and 1975 – and a second peak – from 1977 to 1980 – separated by a moment of disinflation, as we can examine from the graph<sup>2</sup>. The dramatic deceleration of inflation in between can be traced to the lack of the elements that determined double-digit inflation during the previous years. In the first peak, therefore, inflation was imputable to three dominant (non-monetary) shocks: the food prices rise, the increase in energy prices and the wage-price controls, imposed by President Nixon’s administration. While aggregate demand did play some role in the accelerating inflation of 1973-74 and the decelerating inflation of 1975-76, its role was minor compared with that of the three aforementioned factors, whose combined effect can explain a large part of the phenomenon<sup>3</sup>: indeed these, alongside monetary policies measures, played a substantial role in driving inflation rates. Let’s now examine each of them separately.

## I. Food prices

In 1973, due to adverse weather conditions both in the United States and in the rest of the world (a major supply shock), retail food prices rose significantly: this occurrence was reflected in the CPI for food, which surged from a level of 5% from the previous year to 20% in 1973, slowing slightly down to 12% during 1974. Looking at the Consumer Price Index (from now on CPI) as a whole, we can spot an increase of 5.4% from 1972 to 1973; leaving out the food and energy prices component, the growth in inflation rate between these two years appears to be only by 1.7%. Provided that energy prices were still an important factor in the first inflation peak, the major element that pushed prices up was the food shock, which accounted for a considerable part of the overall annual inflation rate between mid-1973

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<sup>1</sup> Source: Burns, A.F., *Inflation: The Fundamental Challenge to Stabilisation Policies*, remarks by Arthur F. Burns, Chairman of the Board of Governors of the Federal Reserve System, before the 17th Annual Monetary Conference of the American Bankers Association, Hot Springs, Virginia, May 18, 1970.

<sup>2</sup> Source: [Inflation, consumer prices for the United States \(FPCPITOTLZGUSA\) | FRED | St. Louis Fed \(stlouisfed.org\)](#).

<sup>3</sup> Demand had very little influence on either the increase or decrease in inflation between 1972 and 1976. This is not to suggest that managing aggregate demand had no relevance to inflation, but rather to emphasize that its impact was relatively modest when compared to the supply shocks.

and mid-1975 and accentuated such an increase by creating indirect effects through the “wage-price spiral” (Blinder, 1979): as food prices rise, they lead to an increase in wages, which, in turn, contributes to a cycle of rising wages and prices.

## II. Oil price shocks

The second shock was caused by the sudden increase in oil prices, decided in October 1973 by the Organization of the Petroleum Exporting Countries (OPEC), counterattacking in light of the pro-Israel stance of Western countries in the Yom Kippur War. Hence, the era of cheap energy, which had lasted since the end of World War II, came to an end. In a very short time – from October 1973 to January 1974 – the price of oil quadrupled, leading to the emergence of massive trade deficits in all countries that were major importers of liquid fuels. While this was a crucial shock, it is important to underline, especially in defining comparisons with the second inflationary peak, that the impact of the 1973-74 energy shock should not be overemphasized, as it was not even comparable to the one caused by the supply chain crisis.

## III. Wage-price controls

The first two aforementioned factors cannot, however, explain the dramatic acceleration and subsequent deceleration of inflation in its entirety. In fact, it is important to also consider the imposition and demission of mandatory wage-price controls: these measures determined the variability of inflation rates in a more pronounced way, by raising inflation when it was already on a high level and decreasing it in the successive deflationary period (Blinder and Newton, 1981). On August 15, 1971, President Nixon announced a three-month freeze on wage prices, which had later evolved through several phases before waning in April 1974. This can explain why the inflation rate endured at a double-digit level, despite the fact that the rate of increase of food and energy prices fell: analysing the monthly data of the Consumer Price Index (CPI) after removing food and energy prices, it's evident that double-digit inflation only occurred during a specific nine-month period starting in February 1974 and then declined rapidly after November 1974. The symmetry in the rise and fall of the inflation rate is quite noticeable, and the reason behind this symmetry can be traced back to the removal of wage-price controls.

Between 1975 and 1976 we observe a specular deceleration of inflation, only to promptly rebound in 1977 and until 1980. Observing the causes that led to such a pattern in inflation rates<sup>4</sup>, it is noticeable that two out of three factors – food and energy prices – manifested both in the periods 1973-1975 and 1977-1980. In addition to those, we also examine mortgage interest rates. The initial thrust for the acceleration of inflation in 1978 primarily originated from the food sector – just as it happened during the first peak, with only a partial contribution from rising mortgage interest rates. The following result of double-digit levels in 1979 largely emerged from the sharp rise in energy prices, empowered by another increase in mortgage rates. Later, in early 1980, mortgage interest rates played the predominant role as a driver for inflation. We can reach such a conclusion by decomposing inflation during the period under examination: as it can be seen, mortgage rates accounted for about one-third of the total acceleration from 1977 to 1978 (0,7 points out of 2,2), about one-quarter of the growth from 1978 to 1979 (1,1 points out of 4,3), and a remarkable portion of the increase from 1979 to early 1980. Looking at the acceleration period as a whole we observe that, while the overall inflation rate rose by 8% (from 6,8% to 14,8%) between 1977 and the first half of 1980, fully 7,2% can be traced directly to energy prices and mortgage interest costs (Blinder, 1982).

#### I. Food shock (a comparison)

Despite the 1978-1979 food shock looking very similar to the one that occurred in 1973, the latter turned out to be far more severe: the Personal Consumption Expenditures (PCE) index rose far more between 1972 and 1974 (by 29%) compared to the *biennium* 1977-79 (by 22%) – albeit the latter lasted longer than the previous one. It is also crucial to underline that the so-called “food inflation” that characterized the second inflationary peak can be also seen as “meat inflation”: meat prices experienced exceptionally high and fluctuating increases between 1978 and 1979, and the reason behind such a phenomenon is that the amount of cattle in the United States continued to decline consistently, a trend that had begun and did not give any signal of cessation since 1975. Initially, there was the widespread belief that the decrease in beef production in 1978 would be compensated for by increased production of pork and poultry; however, unfavourable weather conditions during the winter of 1977-78, together with disease outbreaks, rising costs of animal feed, and

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<sup>4</sup> Despite the CPI-measured inflation rate rising by approximately 8% between 1977 and early 1980, the “baseline” or “underlying” rate may have only risen by as little as 3%: the remaining increase in inflation was imputable to “special factors”. It indicates that the factors discussed above played a major role in boosting inflation during the first peak.



uncertainties surrounding government regulations on the use of nitrites disrupted these expectations. Even later, in 1979, meat prices played a key role in shaping the food-price landscape: when ranchers began “rebuilding” their cattle herds, there was a paradoxical market reduction in meat supplies, which produced a further price increase. However, even removing the meat-prices component, the residual mean inflation index<sup>5</sup> shows a level of 8,4% – not double-digit, but still quite high.

## II. Energy shock (a comparison)

In 1979, the Shah of Iran was overthrown by an Islamic revolution led by Ayatollah Khomeini: his anti-Western statements and the tension with the United States created uncertainty in the oil market, ultimately leading to the second oil-and-energy shock and thus raising the energy price – the disruption of supply made spot-market prices for oil skyrocketing in the second quarter of the same year. The OPEC countries became incredibly wealthy, by raising prices quarterly. From December 1978 to March 1980, the price of imported crude oil per barrel for U.S. refiners (on average) increased significantly, going from approximately \$15 to more than \$33. Such an increase is reflected in the CPI, which rose by 26% between 1973 and March 1974 and by 56% between December 1978 and March 1980 (Blinder, 1982). Let's draw a comparison between the first and second energy shock: evidence displays how the one that occurred in 1979 had a far more severe impact towards inflation (in terms of CPI), as energy had become a key driver of the economy since 1973 – the relative importance of energy items in CPI has increased greatly<sup>6</sup> (Blinder, 1982). Roughly speaking, the 26% rise in consumer energy prices during 1973-74 had a direct effect (approximately 1.5-2%) on the overall Consumer Price Index (CPI). On the other hand, the 56% increase in energy prices during 1979-80 reflected a much higher increase (about 5-6%) on the same CPI items.

## III. Mortgage interest rates

Home mortgage interest rates were a pivotal factor in the second inflationary peak: their rise, unlike food and energy shocks, cannot be accounted for as a completely exogenous component, but more like an effect and, simultaneously, an enhancer. The effect on the inflation rate can be estimated by multiplying the relative importance of mortgage interest rates on CPI by the increase of payments on new mortgages. Let's suppose that:

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<sup>5</sup> This inflation index is inclusive of food prices, except for meat.

<sup>6</sup> Averaging about 0.065 during the first OPEC shock and about 0.10 during the second.

- The relative importance of mortgage interest rates on CPI is equal to 10%.
- Mortgage interest rates increase monthly from 10% to 11%, thus having a percentage change of 10%.
- Hence, we will have an increase of almost 1% in one month ( $10\% \times 10\%$ ).

If such a phenomenon happens over a few months, we can forecast an escalatory impact on annual CPI growth.

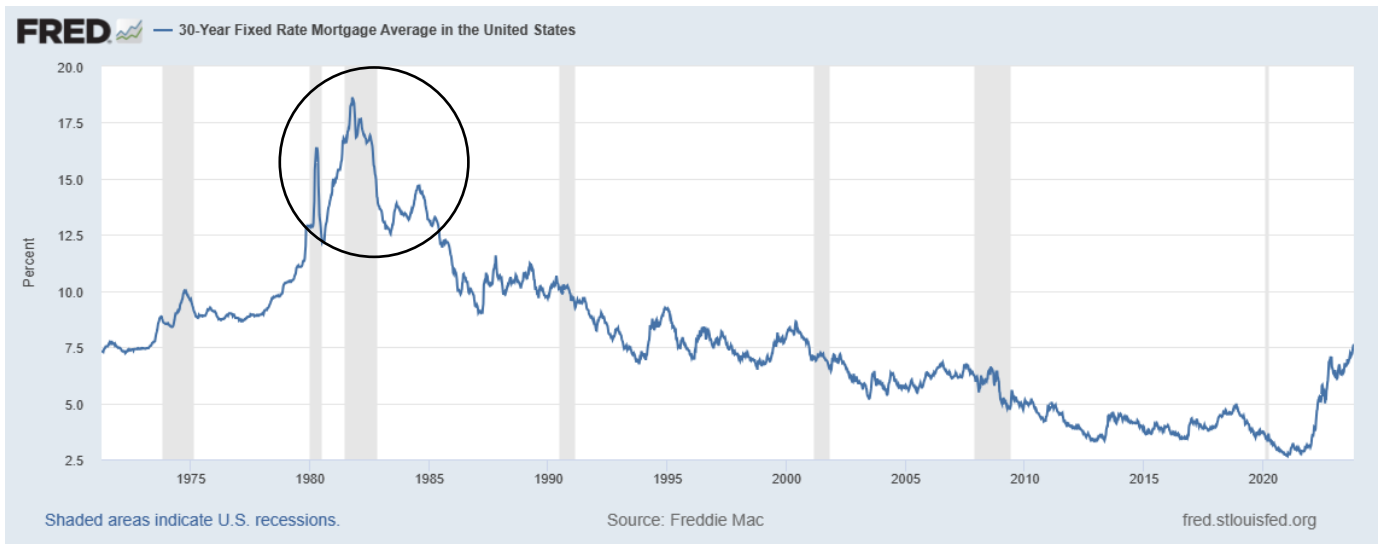


Figure 2 - 30-Year Fixed Mortgage Average in the United States

Throughout 1977, mortgage interest rates remained relatively stable at 9% per annum on average. Hence, CPI excluding mortgage interest rates increased at a similar rate to the overall CPI. However, the situation evolved significantly in 1978 – when mortgage rates began to rise, reaching around 10% by December (as in Figure 2). Consequently, the overall CPI started to increase at a noticeably faster pace compared to the CPI excluding mortgage interest rates. This trend continued in 1979 and early 1980, as mortgage rates experienced an even more rapid escalation. This surge in mortgage rates had a correspondingly dramatic impact on the CPI, with the gap between the inflation rate measured through the CPI and the CPI excluding mortgage interest rates reaching 3.7% by the first half of 1980<sup>7</sup>. However, as rates peaked in the first half of 1980, they fell dramatically during the last semester, resulting in CPI excluding mortgage interest rates (10.9%) being higher than CPI inclusive of such (9.9%), thus reversing the previous trend.

<sup>7</sup> As a result of the difference between CPI inclusive of mortgage interest rates (14.8%) and CPI excluding mortgage interest rates (11.1%).

## 1.2 Robert Barro's perspective on evidence about another important cause of inflation during the 1970s in the United States

If compared to other past episodes of high inflation, or even hyperinflation, the Great Inflation of the 1970s appears to be a much different or rather unique case: in fact, previous peaks of inflation had always been associated with, for instance, wars, civil wars or seigniorage – which corresponds to the necessity, from a certain government perspective, to print money in order to finance budget deficits. In this circumstance, however, the Great Inflation results from a persistent and prolonged inflation condition during peacetime. Robert Barro underlined such a concept, stressing how the Great Inflation occurred at a precise time, which is the separation between money and a commodity base – which, until that time, has been gold or silver – which had provided a strong nominal anchor that had been carrying out the function of stabilizing or reducing inflation expectations.

*“In earlier periods before roughly 1965, the monetary regime guaranteed some long-run stability in monetary growth, and therefore in long-term inflation, which in turn restricted the effects of shifting inflationary expectations. [...] Although there were earlier periods when the United States did not adhere to a gold or silver standard, these episodes typically occurred in times of war and could reasonably be perceived as temporary. The period since 1971 seems to be the first time that we have completely severed, both currently and prospectively, the link between our money and a commodity base. [...] If the above scenario is correct, the inflation problem must be analysed in terms of changes to the basic monetary structure.”*

Here, Barro highlights a critical takeaway from the Great Inflation period, which is the importance of structuring monetary institutions to establish a robust foundation for controlling inflation expectations. Furthermore, we can extract how, according to Barro's statements, Germany's accomplishments in the 1970s and the ability of advanced nations to maintain low and stable inflation after the early 1980s disinflation heavily relied on the presence of this “stabilizing factor”, and how such considerations were probably incorporated in the formulation of monetary frameworks like the Economic and Monetary Union and inflation-targeting systems.

## 1.3 Could policymakers be held responsible?

In the 1970s, economists and policymakers started to commonly distinguish the rise in aggregate prices in two main different inflation types: “Demand-pull” inflation was directly

influenced by macroeconomic policy, and monetary policy in particular. It resulted from policies that produced a level of spending in excess of what the economy could produce without pushing the economy beyond its ordinary productive capacity and pulling more expensive resources into play. “Cost-push” inflation was, on the other hand, caused by supply disruptions, notably originating in food and energy markets (Gordon 1975). From the perspective of central banks, the Great Inflation seemed mostly beyond the influence of monetary policy, as it was primarily sparked by surging oil prices. Yet, the accompanying rise in unemployment rates triggered a response. In an attempt to restore full employment, the Federal Reserve adopted policies that inadvertently intensified the growth of the money supply, causing a general increase in prices. However, this effort failed to alleviate unemployment as intended. Moreover, during the Great Inflation, policymakers faced not just bad data, but also a flawed interpretation of such data. The economist Athanasios Orphanides (2001) retrospectively analysed the information available to policymakers at that time: his findings revealed that the contemporaneous assessment of potential output was considerably inflated, while the estimation of the unemployment rate associated with full employment was notably underrated. This miscalculation hindered their ability to gauge the true economic landscape accurately. Hence, policymakers underestimated the inflationary repercussions of these measures, overlooking their incompatibility with curbing inflation. For this reason, economists attribute a significant responsibility regarding the Great Inflation on the policymakers: in fact, during the decade that preceded the inflationary peaks, the Federal Reserve pursued expansionary monetary policy measures, certain that it could push the economy towards a situation of full employment, as such policies – despite driving up inflation – would have been tolerable, as long as it increased the economic growth and lowered unemployment to the level of its natural rate<sup>8</sup>. The reason behind overcommitting to expansionary monetary policy in that time period is that policymakers believed that unemployment was at a high level – above its natural rate: hence, they were more prone to raise inflation through such measures, in order to lower joblessness and, therefore, improve productivity.

#### 1.4 Is it possible to detect any other factors?

It might also be argued that there existed other reasons, among the ones discussed above, that influenced the Great Inflation of the 1970s within the United States context: in fact,

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<sup>8</sup> The basis for such a belief was given by the Phillips Curve, which underlines an inverse relation between inflation and unemployment.

fiscal policy could have played a key role in boosting the price level<sup>9</sup>, causing an increasing inflationary pressure; the reason behind such an effect is to be searched in the fact that taxation did not increase properly. Looking at the figures concerning the cyclically adjusted budget deficit excluding interest payments,<sup>10</sup> we can notice a pattern of fluctuation, starting from 0.1% to 0.3% of potential GDP between 1962 and 1965, then increasing sensitively to 1.6% in 1966 and reaching a peak of 3.7% in 1968, only to decrease during the following years. Overall, throughout the whole 1970s decade, the deficit ranged between 0.4% and 1.8% of potential output: hence, it seems that, during the Great Inflation, fiscal policy had a stimulative effect. It is worth mentioning the trend followed by the *ex-post* real interest rate: it turns out that, despite remaining at a low level, it was still positive in the period between January 1965 and August 1971<sup>11</sup>. Afterwards, however, it became negative and endured until October 1979 – a date that aligns with the end of the Great Inflation and the beginning of disinflation. Observing how the US monetary policy persisted in being so consistently accommodative, that even led to negative real interest rates throughout the Great Inflation period, draws attention towards two important considerations:

- I. It justifies the decline in the US NEER<sup>12</sup> after the Bretton Woods system collapsed. In fact, the US NEER shows a strong correlation with the changes in the *ex-post* real interest rate over the entire period being examined and it increases sensitively only after the interest rate is raised – which is linked to the Volcker disinflation.
- II. Despite the inflationary shock being caused mainly by food and oil prices, the looseness of US monetary policy in the 1970s might have allowed it to ignite and persist across the entirety of the decade.

## 1.5A different perspective and a comparison with the United States: the Great Inflation in Germany

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<sup>9</sup> As it can be observed in President Johnson's determination to pursue war in Vietnam and the "Great Society" spending programmes.

<sup>10</sup> Reported by the Congressional Budget Office.

<sup>11</sup> Note: August 1971 coincides with the collapse of Bretton Woods.

<sup>12</sup> The Nominal Effective Exchange Rate (NEER) is an indicator that represents the value of a currency's exchange rate against a basket of other currencies weighted by their trade importance. The term 'nominal' is used because this indicator does not take inflation into account, unlike the 'real effective exchange rate,' which also considers price variations between currencies.

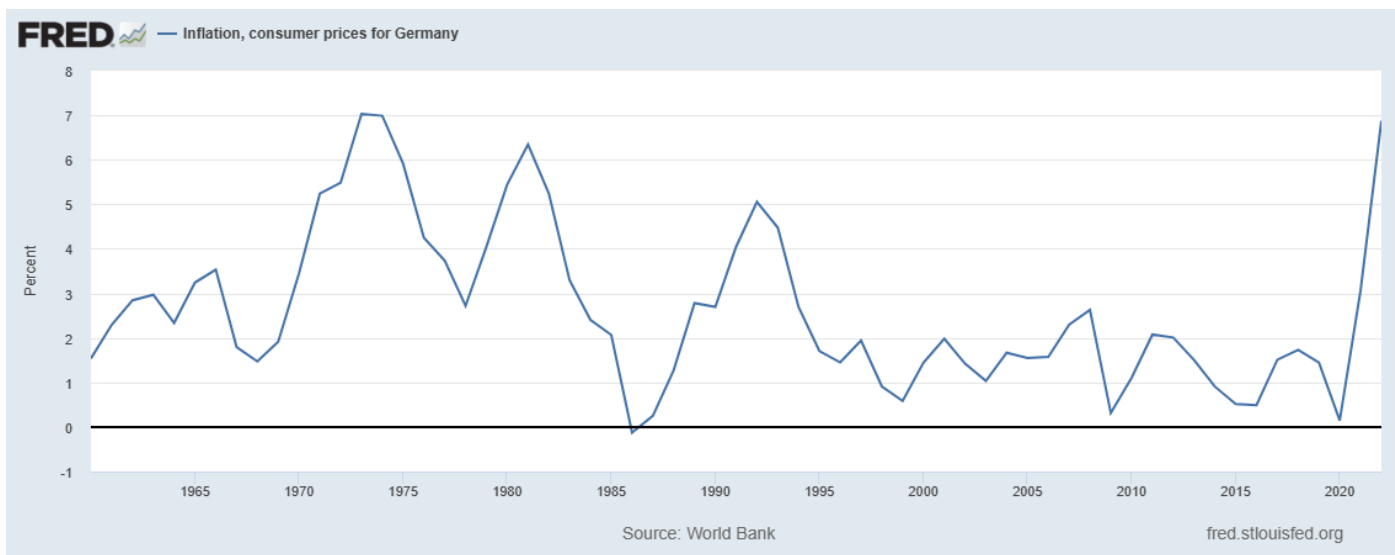


Figure 3 - Inflation CPI for Germany

It is crucial to understand how inflation did not solely affect the United States, rather it concerned most global economies – despite perhaps in a milder way. Let's now proceed with a comparison of the United States and Germany's inflationary patterns and trends throughout the same period taken under examination: looking at *Figure 3*, we may notice how inflationary pressures<sup>13</sup> in Germany had already started in the second half of the 1960s. A significant difference between the two economies lies in the opposite trends of the Nominal Effective Exchange Rate (NEER): while, on one side, Germany's NEER consistently appreciated throughout the whole decade<sup>14</sup> (as shown in *Figure 5*), on the other United States' NEER depreciated in a specular way (*Figure 4*) during the same time span, resulting in 20% lower than Germany's towards the end of the 1970s. This divergence is quite important, as it reveals how such an appreciation of the NEER protected, to some extent, the German economy from inflationary pressures originating on global commodity markets<sup>15</sup>, an advantage that the United States could not benefit from. The stability of the German NEER during the first oil price shock and its rapid appreciation during the second oil price shock explain why, despite higher CPI energy inflation in the United States during

<sup>13</sup> Whose causes are considered to be mainly energy, rather than food prices: this is one main difference vis-à-vis the US.

<sup>14</sup> After abandoning the dollar peg in March 1973, Germany's Nominal Effective Exchange Rate (NEER) quickly appreciated. It then experienced relatively low fluctuations until 1976, when a period of rapid appreciation began, lasting until the end of 1979.

<sup>15</sup> We can notice this by comparing the increases in the "electricity, gas, and fuel" component of the German CPI around the time of the first and second oil price shocks.

the latter episode compared to the former, the opposite was true for Germany (higher inflation during the former and lower in the latter). The mirror-like behaviour of the US and German NEER during the Great Inflation reflects a distinction in the response of the CPI for food and for energy components as, between 1971 and the end of 1979, they increased by 104% and 187%, respectively, for the US and by 42% and 108% for Germany. Hence, this draws attention to how the exchange rate is able to shield an economy against negative supply shocks. Moreover, the key role played by the exchange rate naturally highlights the differences between the monetary policy strategies followed by the respective central banks particularly during the Great Inflation: we can observe how contrasting ways of dealing with monetary policy have led to different outcomes in a time of crisis. With this regard, the measures pursued by Germany, e.g. in terms of interest rates<sup>16</sup>, seem to be more foresighted and appropriate, as they provided a sufficient protection against rising inflation.

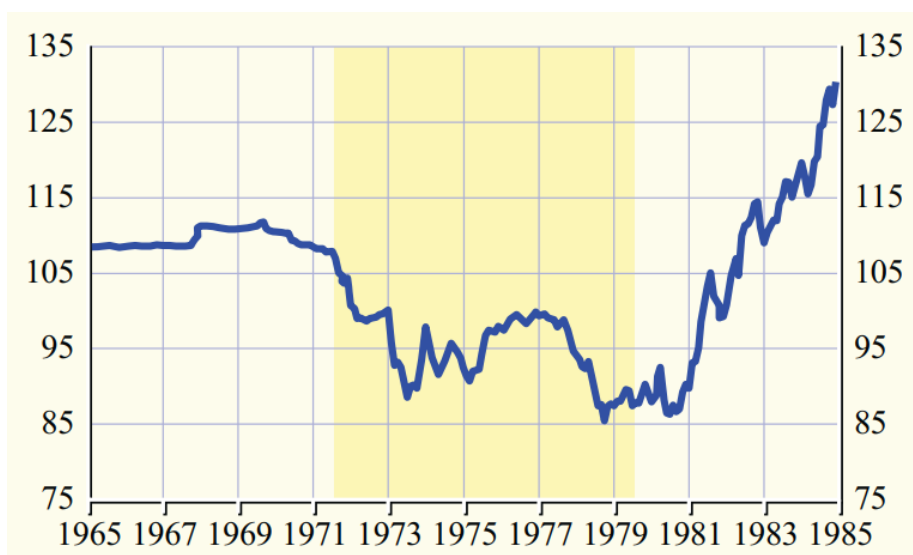


Figure 4 - Nominal effective exchange rate for the US (index: Jan. 1972 = 100). Source: European Central Bank

<sup>16</sup> This is because of the influence interest rates can exert on the NEER (strengthening or weakening), primarily by attracting or deterring foreign investments.

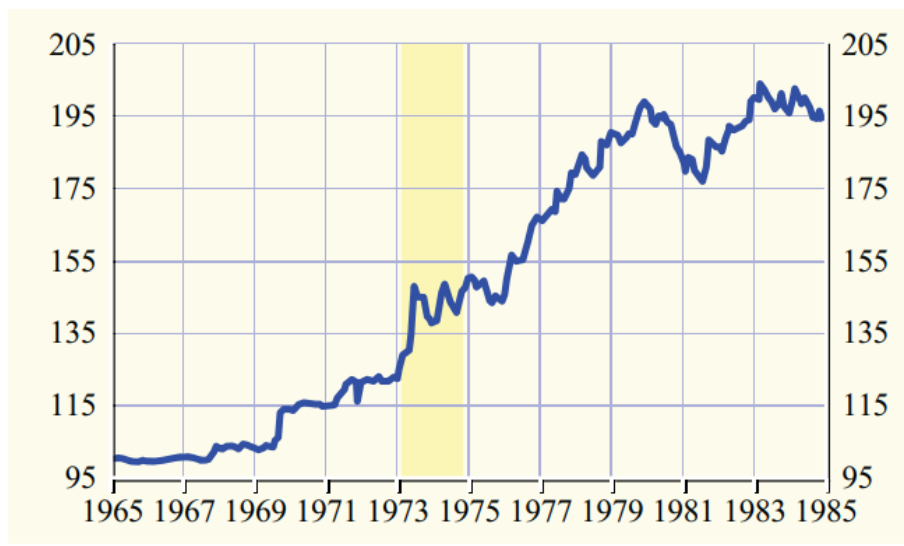


Figure 5 - Nominal effective exchange rate for Germany (index: Jan. 1965 = 100). Source: European Central Bank

1.6 Can we observe a relationship between the price level and unemployment?

### 1.6.1 Stagflation

In addition to the severe inflation, we must certainly account for the intense slowdown of productivity growth to explain the transition from the optimism of the 1950s and 1960s to the gloom, which characterized the 1970s and 1980s: in fact, in all OECD countries, inflation increased, but so did also unemployment: such a combination of economic stagnation and inflation, known as "stagflation," was the primary riddle to solve for policymakers and economists, as it was not anticipated in traditional economic policy models. In 1964, inflation stood at around 1% while unemployment was at 5%. A decade later, inflation skyrocketed to over 12%, coinciding with unemployment rising above 7%. By the summer of 1980, inflation had surged to nearly 14.5%, accompanied by unemployment surpassing 7.5%. Throughout the whole 1970s decade and in the early 1980s, business investment slowed, productivity faltered, and the United States' trade balance vis-à-vis the rest of the world had worsened. There is a widespread opinion that this phenomenon can be attributed to the fact that most industrial countries were forced to control the price level – in order to cope with the prolonged inflationary period – and it is simply impossible to stop entrenched inflation without creating considerable transitional unemployment. Therefore, the deceleration in productivity growth presented a significant challenge, characterized by its intricate nature and complexity, making it a notably elusive problem to comprehensively understand and solve. But which can be accounted as the main reasons for what has been defined as 'the Great Stagflation'? Economists have provided several



different interpretations; however, it is clear that a combination of elements has to be held responsible.

- Inflation was perceived as a key cause for the slowdown of productivity growth, leading to the inflationary recessions of the 1970s and 1980s. Moreover, it created a vicious cycle, which turned out to be a strengthening driver for inflation itself: as policymakers were trying to lower unemployment, inflation would rise higher, causing joblessness to surge, and so on. Among the indirect effects, we have to consider how inflation, especially when persistent such as in this case, works as a deterrent for those investments which long-run productivity growth relies on, thus contributing significantly to the economic deceleration.
- A crucial factor can be seen in the two oil shocks that hit the major global economies in 1973 and 1979: in fact, the oil price is perceived to be responsible for the slowdown respectively in a direct and indirect way – the latter is through the rise in inflation. However, it is important to stress that the relevance of the oil shock has been heavily exaggerated: if, on one side, oil prices were a significant burden for importing countries, on the other side no country was majorly suffering only from it. For instance, in the United States, oil prices skyrocketed, leading to an annual oil import bill of about \$20 billion, which adds up to approximately 1.2% of US GNP<sup>17</sup>. Nonetheless, if it was true that oil prices held such major responsibility as a driver for stagnation, a reduction of real incomes by 1.2% would have easily eliminated the issue; assuming wage rigidity, a once-for-all increase in the price level by 1.2%, not a matter of great importance in a period of two-digit inflation, would have fixed the problem. Hence, we derive that other factors were the major contributors to the recession.
- It is believed that another reason for a slowdown in productivity growth – and, therefore, a cause of economic stagnation – was a decrease in the performance of the workforce, due to an erosion of “work effort”: if the government provides welfare benefits, unemployment subsidies, and other social welfare measures, it naturally becomes a more difficult challenge for employers to make work discipline an imperative, as the threat of job loss is no longer compelling as before. To some extent, there is evidence that such a situation actually occurred in the Great Stagnation of the 1970s, despite the weakening of labour unions.

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<sup>17</sup> Gross National Product (GNP) measures the total value of all finished goods and services produced by a country's residents (businesses and citizens), both domestically and abroad, within a specific time frame (a year).

- There is also evidence for indirect adverse effects on productivity growth through real wage resistance leading to unemployment and inflation, which enhanced the economic slowdown. Other factors should also be considered, such as the fact that governmental regulations might have mandated an increasing portion of the labour and capital employed by businesses to be directed toward pollution control and ensuring employee safety and health. Such regulations may have required companies to invest resources, time, and money to comply with environmental standards and provide safe and healthy working conditions for their employees. The escalation in crime rates has compelled businesses to allocate resources toward crime prevention: the direct impact of merchandise theft appears to have sensitively reduced the output. Furthermore, it is shown that technical progress slowed down<sup>18</sup>: one of the most plausible explanations for this phenomenon is the theory affirming that the rate of savings and investment has been sharply reduced by government policies – mainly consisting of tax disincentives for savings and investment. Such a circumstance, produced by the combination of all these different elements, might have affected the allocation of resources within companies, potentially reducing their availability for other sectors or investments and, as a consequence, productivity growth.

### 1.6.2 The relation between inflation and unemployment and the Phillips Curve

As already analysed in the previous paragraphs, certain economists have retrospectively criticized those monetary policy measures undertaken with the intention of lowering the unemployment rate but only resulted in an increase in inflation during the following time period. In fact, at first policymakers tried to lower unemployment, even though this would have caused a modest increase in inflation; afterwards, however, inflation became the main issue, so policymakers were willing to lower it, in spite of the side effects on the unemployment rate. Such actions were motivated by the belief that an increase in inflation – due to an increase in money supply – would have still been acceptable, as it would have produced a decrease in the unemployment rate<sup>19</sup> and, therefore, would have boosted economic growth (and vice versa). These ideas relied on the Phillips Curve, which is an economic concept that suggests the existence of an inverse relation between inflation and

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<sup>18</sup> Evidence of this has been found in the decreasing number of new patents granted by the patent offices of the United States and other countries, which allows us to derive a reduction of new inventions and discoveries.

<sup>19</sup> As its level was thought to be above the natural unemployment rate.

unemployment: hence, it claims that, as unemployment decreases, inflation tends to increase, and vice versa. Furthermore, the Phillips curve and the policies that were derived from it set their basis on two main assumptions:

- 1) Inflation is considered a nonmonetary phenomenon, that is, it was believed that inflation was not essentially caused by central banks lacking control over monetary policy, but rather by several real factors of the economy – thus, excluding money supply as a key tool used to control the price level. Hence, it was the real character of inflation that made the Phillips curve, rather than money, the relevant predictor of inflation.
- 2) The second element to be assumed was a deep understanding, from the perspective of policymakers, of the real economic structure: they were supposed to have gained comprehensive insights and to be able to actively pursue specific objectives, such as achieving an acceptable level of unemployment. Policymakers were believed to know the level of unemployment associated with full employment (commonly set at 4%) and could predict the behaviour of the economy based on the policies adopted.

If the aforementioned were true, then policymakers would quite easily forecast the behaviour of the economy and exploit the trade-off predicted by the Phillips curve accordingly<sup>20</sup>. However, as mentioned above, the Great Inflation contradicted such an interpretation of the relation between inflation and unemployment, as their levels were both at a peak during the 1970s. In fact, comparing the charts below (*Figure 6*, which illustrates the trends and developments of unemployment and inflation), it is possible to observe that the two variables adhere to a similar pattern, despite a sensitive time-lag: in fact, inflation is the first to increase to a double-digit level both in the first and second inflationary peak<sup>21</sup>, followed by unemployment: such a situation was certainly not consistent with the Phillips curve. Prior to that period, the Phillips curve was the sole method used to guide policy decisions: however, the Great Inflation underlined its limitations showing how other different factors, such as supply shocks, could disrupt such relation. Hence, the stable trade-off between inflation and unemployment, which policymakers hoped to exploit, proved unstable. For this reason, economists and policymakers started to reassess their reliance on

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<sup>20</sup>This means that they would implement an expansionary monetary policy in order to lower the level of unemployment, at an acceptable increase in the price level; in a similar way, when unemployment became an intermediate objective for lowering the price level, they would manage inflation – with an acceptable cost in terms of raising joblessness.

<sup>21</sup> Inflation registered a value of 6.18% in 1973 and, subsequently, 11.05% the following year, while unemployment began to rise in late 1974, reaching a peak of 9% in May 1975. As for the second inflationary crisis, inflation arrived at almost 8% in 1978, surging at above 13% during 1980, while unemployment started to increase in late 1981, peaking at 10.80% in November 1982.

the Phillips curve as a precise tool for predicting the trade-off between inflation and unemployment, leading to the development of new economic theories and models that accounted for a broader range of factors influencing inflation and employment dynamics, moving away from a simple inverse relationship between the two variables.

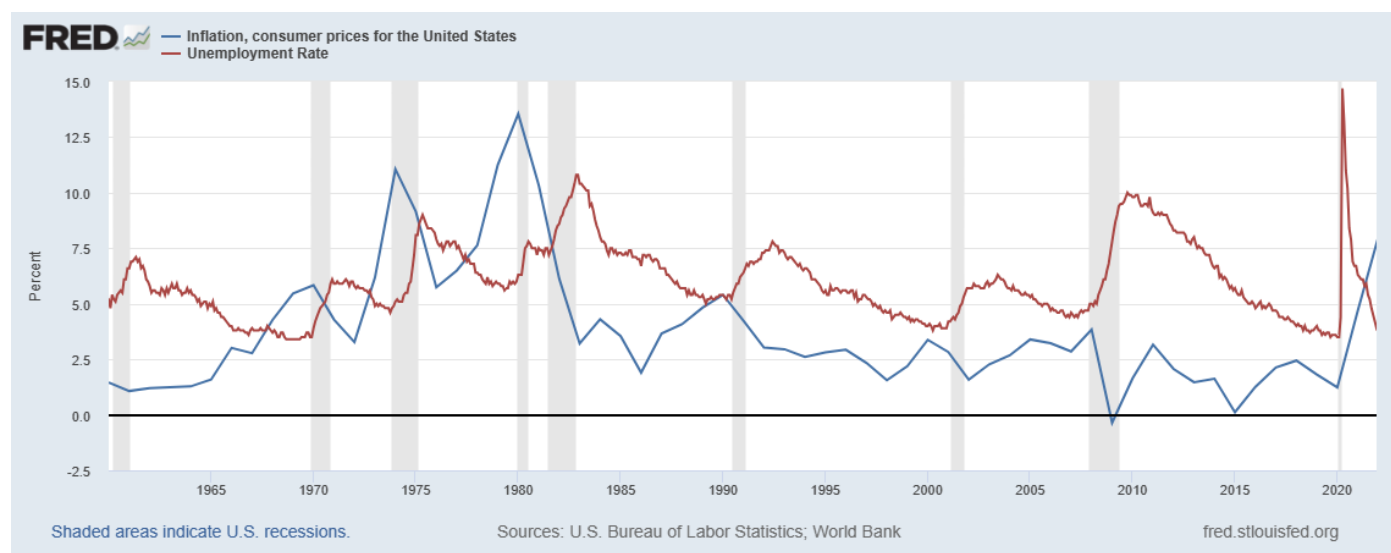


Figure 6- Unemployment rate and inflation rate for the United States (1960-2021)

### 1.7 Monetary policy response

As already mentioned in the previous paragraphs, the Great Inflation was caused by a combination of several drivers, among which the rising price of oil and monetary policy mistakes surely stand out. Among the latter, we can recall not only misinformation issues, but also the fact that policymakers preferred to place a higher priority on stabilizing real economic activity relative to price stability. In addition, they tended to overestimate the productive capacity of the economy in the period preceding the crisis, and they were overly optimistic and confident on their ability of interpreting the data available at the time and of understanding the impact and underlying linkage of certain monetary policy measures and inflation. Orphanides (2002) and Orphanides and Williams (2005a), also suggest that there was an excessively strong monetary response to flawed data relative to the “economic slack”, which could partially explain the high inflation and unemployment rates in the second half of the 1960s and at the beginning of the 1970s. The aforementioned authors point out that, if the policies were less aggressive, they could have been more

effective in stabilizing both variables before the peaks occurred, which could have had a beneficial effect on the subsequent crisis.

Nonetheless, as a response to the jump in oil prices, unemployment rates started also to increase. Hence, in order to try to create full employment, the Federal Reserve had implemented policies that, as a matter of fact, accelerated the expansion of money supply and raised overall prices, without achieving the main goal of unemployment reduction. The inflationary effects of such policies were heavily underestimated by policymakers, who didn't consider how they were not feasible without accelerating inflation. Thus, the Federal Reserve began to recognize that inflation was occurring and was heavily imputable to their attempt to achieve full employment without compromising price stability. However, the circumstances changed pivotally with Volcker's tenure as Federal Reserve Chairman<sup>22</sup>, as he stated very clearly his intentions to make fighting inflation his top priority. In response to questions about his views on the money supply, Volcker responded that it had been "*rising at a pretty good clip*", and that there was no evidence of the nation "*suffering grievously from a shortage of money*" (Dow Jones News Service July 30, 1979). Such statements are ironic, as he intended that, despite the money supply increasing steadily, there were no signs that such an injection of money in the economy was justified. In fact, just a few weeks into his mandate, Volcker declared he would focus on restraining money supply growth, aiming at maintaining prices stable and, as an ultimate goal, promoting sustainable economic growth for the United States. During a press conference on October 6, 1979, Volcker announced the results of an unscheduled Federal Open Market Committee meeting held earlier that day. By that time, it was generally accepted that reducing inflation required greater control over the growth rate of reserves specifically, and broad money more generally. Indeed, the Employment Act of 1946<sup>23</sup> was recently re-codified in 1978 by the Full Employment and Balanced Growth Act<sup>24</sup>, which explicitly charged the Federal Reserve to pursue full employment and price stability but, in addition, also required the central bank to establish specific targets for determining the growth of the monetary aggregates. Despite that, it was evident that a tighter control of money supply growth was necessary. Volcker declared:

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<sup>22</sup> Former president of the Federal Reserve Bank of New York, he became Chairman of the Federal Reserve Board, taking office in August.

<sup>23</sup> This act already had as its main goals the achievement of full employment and economic growth, as well as price stability, and it can be considered as a significant step in the development of economic policies in the United States.

<sup>24</sup> More commonly known as the Humphrey-Hawkins Act.

*“By emphasizing the supply of reserves and constraining the growth of the money supply through the reserve mechanism, we think we can get firmer control over the growth in money supply in a shorter period of time, but the other side of the coin is in supplying the reserve in that manner, the daily rate in the market [...] is apt to fluctuate over a wider range than had been the practice in recent years” (Federal Reserve Bank of St. Louis 1979).*

Volcker explained the FOMC would shift its focus to target reserve growth rather than the Federal Reserve's funds rate as its policy instrument <sup>25</sup>: this measure was aimed to promote greater price stability, as fighting inflation was now seen as necessary to achieve both objectives of the dual mandate, even if it temporarily caused disruption to economic activity and, for a time, raised unemployment. Indeed, in early 1980, Volcker stated,

*“My basic philosophy is that we have no choice but to deal with the inflationary situation because, over time, inflation and the unemployment rate go together.... Isn't that the lesson of the 1970s?” (Meltzer 2009).*

As a consequence of the new tightening of money supply, the Federal funds rate peaked at a level of 18.90% in December 1980 (Figure 7) and even at 19.08% in January 1981 – a symptom of the implementation of such monetary policy measures. Meanwhile, inflation continued to increase, and so did unemployment, but Volcker had already warned that a similar outcome was possible soon after the FOMC resolution as, in his words, *“some difficult adjustments may lie ahead”* (Federal Reserve Bank of St. Louis 1979).

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<sup>25</sup>That is, the FOMC would have paid attention to managing the volume of bank reserves in the system instead of trying to manage the day-to-day level of the federal funds rate (Lindsey et al. 2005).

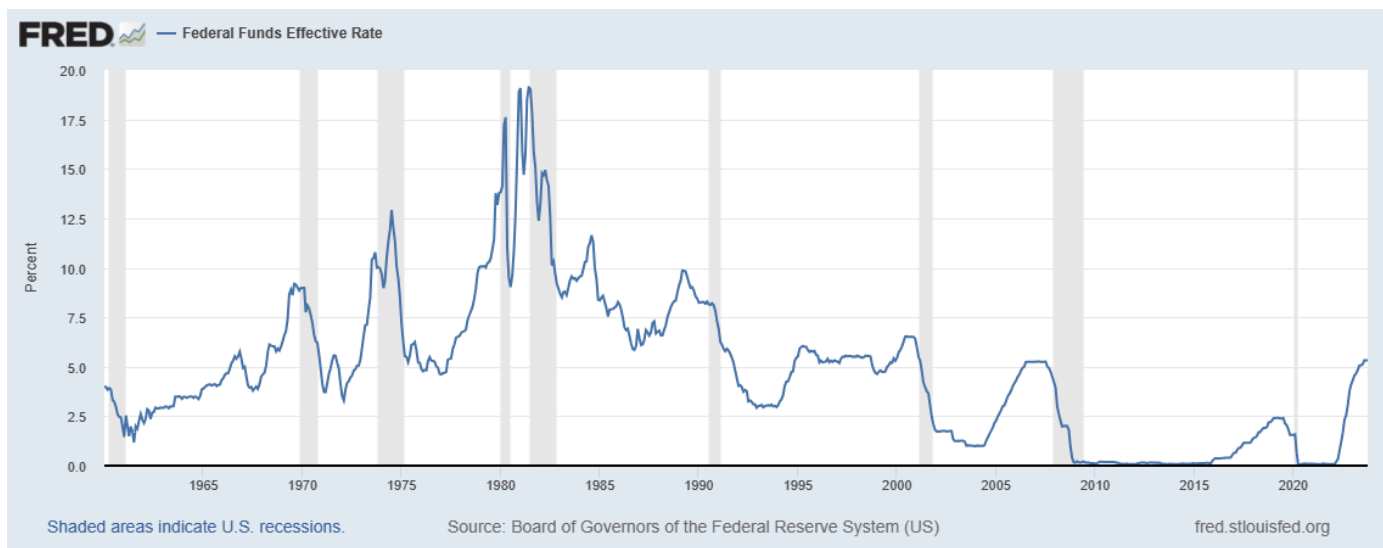


Figure 7 - Federal Funds rate

In light of such difficulties, pressure on the Federal Reserve rose from both political parties. “We are destroying the small businessman. We are destroying Middle America. We are destroying the American dream,” conservative Congressman George Hansen said during a 1981 hearing (Todd 2012). Treasury Secretary Donald Regan directly criticized the Federal Reserve’s position during an interview with a *New York Times* reporter: “What I am suggesting is that if (money supply growth) stays here, you’re going to have a severe recession” declared Regan, who then went on to suggest how the money supply needed to be gradually adjusted in the future (Todd 2012). However, after hitting its peak in 1980, inflation began to decline, falling to 6.13% in early 1982 and then to just above 3% in the following year. The unemployment rate hit a peak of 10.8% in late 1982, before beginning to consistently decline. Hence, over time, greater control of reserves and money growth produced a desired slowing in inflation. With the recovery at hand and inflation greatly reduced, the political pressure on Volcker and the Federal Reserve was released, and the economy entered a new period of sustained growth and low inflation. Prior to the announcement made in October 1979, policies implemented by the Federal Reserve had produced high and variable inflation and contributed to macroeconomic instability, so there was very little confidence that inflation could rapidly be brought under control without enormous economic disruption; however, by breaking with traditional operating procedures, and persevering in its actions, the Federal Reserve could restore its trustworthiness, as well as re-establish credibility for low inflation rates (Goodfriend and King 2005). Although there had been other attempts to control inflation while limiting the costly

side effect of higher unemployment, such as the wage and price controls introduced during the Nixon administration, they turned out to be unsuccessful: it's true that they temporarily eased off inflation but, on the other hand, they exacerbated shortages – in particular for what concerns food and energy.



## Chapter 2 – Oil prices and inflation: what is different between the 1970s and the Great Recession?

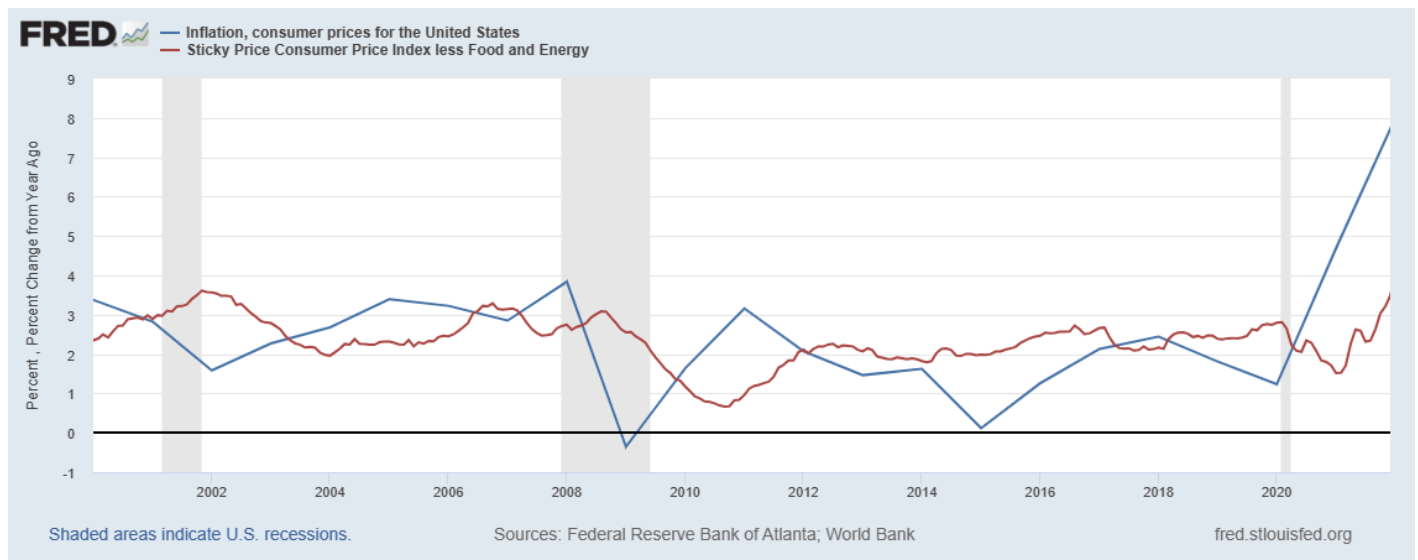


Figure 8 - Headline and core inflation for the United States (2000 - 2021)

### 2.1 Overview

The recession hitting the global economies in 2008-09 was characterised by unprecedented depth and lasted 18 months, making it the longest in the post-war period. Real GDP declined steeply, giving rise to a substantial widening of the output gap. Regarding its depth, we can divide the Great Recession into two distinct phases: during the first one, which lasted until June 2008, the recession was not particularly severe in terms of change in GDP or unemployment. However, it deepened sharply in the third quarter of 2008, as the second phase started (and most of the decline occurred) and remained as such through the first quarter of 2009. After a slight further drop in the second quarter of 2009, the economy returned to expansion as the third quarter approached. Overall, the decline in GDP during the entire period of the recession, cumulatively 4.1%, was the deepest in the post-war period – far more than it occurred in recent previous recessions<sup>26</sup>. Hence, the Great Recession of 2008-2009 was one of the gravest recessions for several decades, and the impact this recession made on inflation dynamics across different countries has been

<sup>26</sup> I.e., in the 1973 recession, there was a cumulative decline of 3% in GDP; afterwards, the 1981 recession saw a cumulative GDP drop of 2.9%, following a separate recession a year earlier, which resulted in a 2.2% decrease in GDP. Later, the output fell by 1.4% in 1990-1991 and by 0.3% in the 2001 recession. Compared to the Great Recession, these crises saw a relatively tight decline in GDP.

widely analysed. Rising energy and commodity prices (oil in particular) boosted inflation in the first half of 2008, when it peaked at a level of 3.8%, as we can observe from *Figure 8*, *blue line* (headline inflation spiked suddenly). Despite that temporary episode, downward price movements in those same products were able to lead inflation to a steep decline, beginning at the end of 2008 and persisting until mid-2009. Naturally, such a drop in the CPI (highlighted in *Figure 8*) was severely amplified by the Great Recession developing simultaneously.

It is crucial to underline how inflation exhibited high volatility: such a feature was imputable to the joint effect of one of the most severe commodity shocks in history (the Goldman Sachs commodity price index went from 490 in mid-2007 to 860 in mid-2008), and the immediate aftermath of the epicentre of the crisis in September 2008 that saw big swings in currencies. In particular, as we can observe in *Figure 8* (blue line), we notice how headline inflation rose by almost one percentage point between 2007 and 2008, reaching just below the level of 4%; after such a peak, however, it dramatically dropped to negative in early 2009, just to rebound again standing at about 3% after the Great Recession, hence eliminating the fear for deflation. Let's now analyse such a pattern in detail and try to explain its main drivers.

## 2.2 Oil prices (inflation surge)

Such an increase in inflation can be primarily attributable to the fluctuations in oil prices, which reached \$140 per barrel in early 2008: this peak in oil prices affected costs for production and transportation, which naturally reflected in the prices of goods and services. However, just after it had risen, inflation dramatically dropped during the second half of the same year, as oil prices fell<sup>27</sup>, and also due to the effects of the Great Recession. From a historical perspective, such an episode of rapidly rising and falling oil prices seems almost unprecedented in terms of both the speed and magnitude of the movements. Indeed, although there have been periods of either faster price rises, e.g., after the Yom Kippur War in 1973, or stronger, albeit slower, price declines, e.g., during the 1980s, the 2008-2009 episode stands out for the steepness of both the upward and downward path. Moreover, all slightly comparable previous episodes are often related directly to dramatic

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<sup>27</sup> During the 2008-09 global recession, the price of Brent crude oil sharply fell from around \$150 per barrel in mid-2008 to about \$40 per barrel at the turn of 2009. This 70% drop marked a reversal in the steep upward trend in oil prices that had started in the early 2000s. However, as soon as the first signs of a recovery in global activity appeared, oil prices began to rise again.

geopolitical developments originating from conflicts in the Middle East, e.g., the embargo by the Organization of the Petroleum Exporting Countries (OPEC) in 1973. In other words, the main drivers of the sharp movements in oil prices up to the late 1990s were supply shocks. Hence, the movements in oil prices tended to drive the economic cycle rather than be an outcome of it. For instance, oil prices more than tripled in the aftermath of OPEC's drastic reduction in oil supply in November 1973, estimated as 7.5% of global output at the time. The severe recession that set in at that time was due to a lack of alternative sources of oil supply and the highly oil-intensive nature of the global economy. Similarly, the oil price shock of 1979 also triggered an economic recession. In such a case, however, the two elements are more intertwined with each other and oil prices can be considered also a consequence of the crisis.

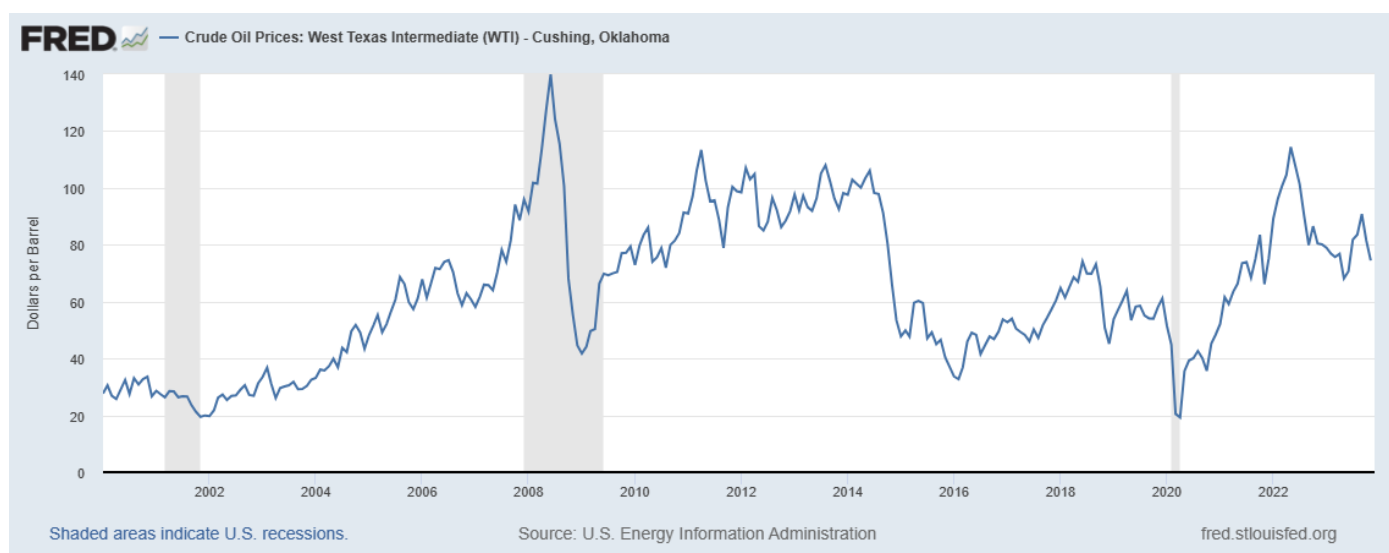


Figure 9 - Crude oil prices for the United States (2000-2023)

Furthermore, as we take a closer look at the oil price trends throughout the Great Recession, both in the United States (Figure 9) and Europe, we can define a pattern that overlaps with the trend in inflation during the same period. The correlation between the two variables is even more interesting if we compare the trend in crude oil prices to inflation measured through the HICP<sup>28</sup> (Figure 10).

<sup>28</sup> Harmonized Index of Consumer Prices: a statistical measure that estimates the average price changes of goods and services consumed by households within a specific region or country. It provides a standardized

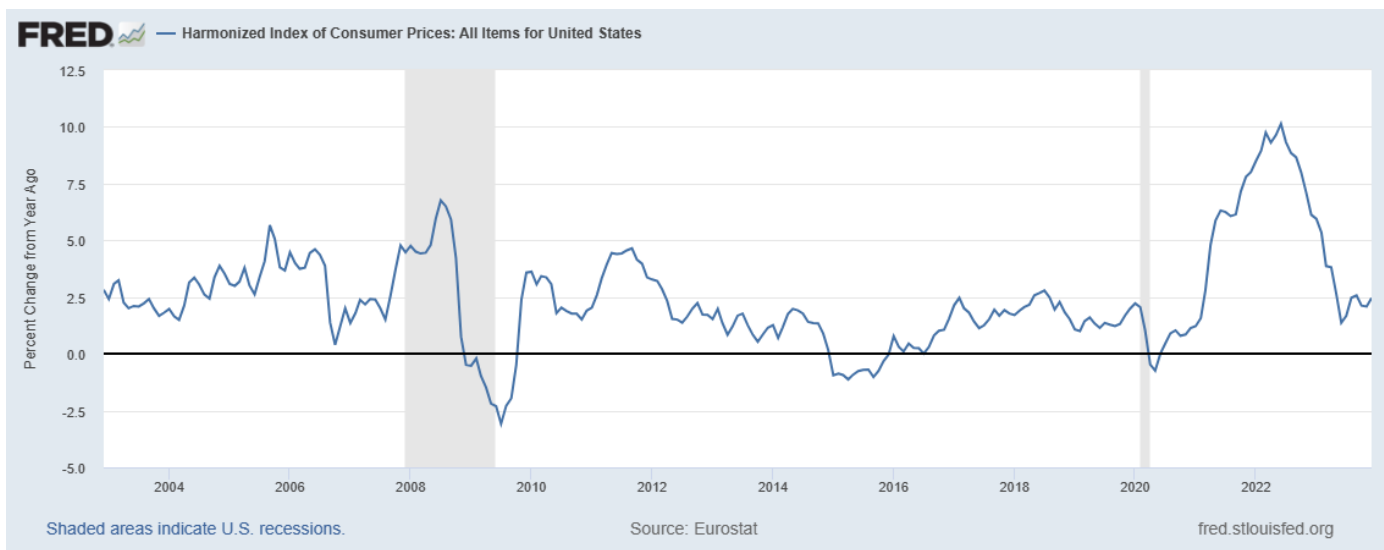


Figure 10 - Inflation in the United States as measured by the HICP

Indeed, the relatively strong impact that oil prices had on the energy component of the HICP at the time of the 2008-09 recession was attributable not only to the large fluctuations in crude oil prices, but also to the fact that they were standing at a much higher level, compared to past episodes of pronounced fluctuations in oil prices. Furthermore, the fact that the impact of oil price changes on the HICP depends on the oil price level reflects the fact that the impact of oil price increases on consumer prices for liquid fuels is cushioned by relatively stable distribution margins<sup>29</sup>, and in particular by the excise duties on fuel, which are set as a fixed amount per litre.

In other words, during the recession, oil prices significantly impacted the HICP energy component not just because they were fluctuating a lot but also because they were higher vis-à-vis during previous swings. Likewise, changes in oil prices affect consumer prices for fuels differently depending on how high the oil prices are due to fixed taxes per litre and stable distribution margins.

To clarify by using an example, if oil prices are at €20 per barrel, a 10% increase in crude oil prices is estimated to lead to an average increase in the energy component of the HICP of approximately 1.6%. However, if oil prices stand at €100 per barrel, the impact rises to

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method for assessing inflation by considering a predetermined basket of consumer items, thus facilitating comparisons of price changes over time.

<sup>29</sup> Distribution margins refer to the difference between the cost of production and the final retail price. In the context of oil and fuel, they include costs related to transportation, refining, and marketing.

around 4.2%<sup>30</sup>. The higher level at which crude oil prices were standing at the time explains why the impact of the surge and slump in oil prices on the energy component of the HICP at the time of the 2008-09 recession was so evident, even though the developments in terms of annual percentage changes were less exceptional. The subsequent sharp decline in oil prices (see *Figure 9*) was triggered by a growing number of signals pointing to a major decline in global economic activity and then exacerbated by the eruption of the financial crisis. The index of industrial production (excluding construction) fell by about 13% during the 2008-09 recession. This followed the buoyant growth in both global activity and oil prices prior to the crisis, which indicates that there has been a strong link between oil price movements and the global business cycle in the previous years. A key factor in this has been the more prominent role being played by non-OECD countries in driving the global business cycle and determining global oil demand in the presence of limited supply growth, which is also supported by the fact that the pronounced movements in oil prices very closely mirrored those in food and other commodity prices, rather than following a more idiosyncratic path.

### 2.3 Economic slowdown

As it was previously mentioned, the successive quick drop in oil prices during the 2008-09 recession was, at first, imputable to several elements indicating an extreme decline in global economic activity. However, the outbreak of the financial crisis significantly influenced oil prices, exacerbating the situation. Economic contraction reduced the energy demand, leading to a notable drop in oil prices which, on their behalf, influenced prices on a large scale – as can be noted from a steep decrease in the CPI (*Figure 8, blue line*). This downturn in prices increased the risk of deflation, sparking serious concerns for the global economy. As it will be further analysed, the risk of deflation tends to be higher during a financial crisis because economic uncertainty can, for instance, constrict the flow of credit to households and businesses. In light of such circumstances, policymakers and economists were concerned about the economy falling into a downward deflationary

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<sup>30</sup> This shows how the impact on the HICP index depends on the crude oil prices, the higher the impact on inflation, here respectively 1.6% if oil stands at \$20 per barrel and 4.2% if it is at about \$100 per barrel; moreover, we can observe that the impact on the HICP is mitigated by distribution margins and excise duties (from 10%, which is the original increase in crude oil prices to 1.6% and 4.2% in each case.

spiral<sup>31</sup>. Despite the severity of the financial crisis and recession that erupted in 2008, the U.S. economy has avoided falling into such a vicious cycle as, since mid-2009, the economy had initiated a path of recovery. However, the pace of economic growth during the recovery was relatively slow, and the economic weaknesses persisted. In such an economic environment, the risk of deflation remained significant and could have delayed sustained economic recovery. Let's conduct a more comprehensive analysis. As anticipated before, in 2008 and 2009, the U.S. economy received a significant adverse demand shock from the combined impact of the financial fallout from the bursting of the housing price bubble in 2006 and the sharp cyclical downturn of the economy starting in late 2007, which persisted through mid-2009. Reflecting the severity of the Great Recession, the CPI declined by about 2.0% between July 2008 and July 2009, leading to a high deflationary risk. Despite the stringency of the contraction of economic activity, an exacerbating deflationary spiral was avoided. Indeed, with the pickup in economic activity in the second half of 2009, the CPI increased through early 2010.

Economic recovery began in the last half of 2009 and continued into 2010. With the return of economic growth, the price level stabilized and began to rise again, up to about 1.0% through the first quarter of 2010. Throughout 2010, however, the CPI increased at a significantly slower rate. For the 12 months ending in June 2010, the "headline" CPI grew by 1.1% from 2.0% in May 2010 and 2.7% in January 2010. Nevertheless, over the six months through June 2010, this index declined 0.1%. The "core" CPI, which excludes often volatile food and energy prices, tells a similar story. For the 12 months ending in June 2010, the core inflation rate was 0.9% - the lowest rate of increase in 44 years; over the six months through June 2010, it further decelerated to an average annual rate of 0.4% - leading again to high deflationary risks.

## 2.4 Deflation

### 2.4.1 What is deflation?

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<sup>31</sup> It is a self-reinforcing cycle in an economy where falling prices lead to reduced spending, which further causes businesses to cut prices or reduce production, leading to further decreases in prices. In other words, it is a negative loop where declining prices lead to reduced demand, resulting in lower production and employment, leading to additional price declines. This cycle can potentially result in further economic recession or depression as it becomes increasingly difficult for businesses to operate profitably and for consumers to spend due to expectations of lower future prices.

It is possible to define deflation as a persistent decline in the overall level of prices. Even though it is not unusual for prices to fall in a particular sector because of, among other reasons, rising productivity, falling costs, or weak demand relative to the wider economy. For instance, although the overall price level of the U.S. economy from 1998 through 2008 increased by about 34%, computer prices over the same period decreased by slightly over 75%, due to the fact that production costs steadily fell. But such a decline was limited, hence not capable to affect the overall economy and did not constitute deflation. In contrast, deflation occurs when price declines are so widespread and sustained that they cause a broad-based price index, such as the Consumer Price Index (CPI), to decrease for several quarters. Such a persistent trend in the price level is far more problematic, as in a weak or contracting economy it can lead to a damaging self-reinforcing downward spiral of prices and economic activity.

Generally speaking, financial crises typically result in deflationary effects, due to heightened economic uncertainty, which in turn tends to affect the demand for liquidity by banks and financial institutions, thus constricting the flow of credit to households and businesses and depressing their credit-supported spending.

In other words, the higher uncertainty tends to push down aggregate demand as consumers and businesses become more cautious with their spending. As a result, there is an increased demand for liquidity by banks and financial institutions, leading to a constricted flow of credit to households and businesses. This reduction in credit availability further depresses aggregate demand and exacerbates the economic downturn.

Hence, if consumption slows down in the present time, such a phenomenon will exert downward pressure on most current prices; if the latter start to decline, households and businesses will be likely to reformulate their expectations on future prices to fall as well.<sup>32</sup>

Supposing that the current prices are perceived to be excessively high, compared to future price expectations, the same economic agents will most likely postpone current purchases

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<sup>32</sup> The expectations of households and businesses about the future path of the price level will affect deflation's persistence and the difficulty of stabilizing the falling price level, thus creating a self-reinforcing downward spiral that deepens and prolongs the fall of economic activity as households and businesses adjust their economic outlooks. To avoid that outcome, governments would likely need to take policy actions that not only counterattack the current negative demand shock but also create the expectation among economic agents that the future price level will be higher than the current one. But how would economic policy contain or mitigate the negative effects of deflation caused by a negative demand shock? The conventional macroeconomic tools of monetary and fiscal policies could be used to support current aggregate spending and exert upward pressure on the price level.

in the future, based on the belief that prices will fall even further. This will lead to a more pronounced slowing of the current consumption and, as a consequence, of the economic activity<sup>33</sup>. The economy may ultimately reach a point at which the current price level has fallen sufficiently (i.e., sufficient deflation has occurred) relative to the expected future price level to boost current spending. However, the fall of economic activity needed to cause that change in expectations could be protracted and costly, involving large output losses and high rates of unemployment. In particular, deflation may detrimentally affect economic activity through several channels:

- Increasing the real (inflation-adjusted) cost of inputs, thus raising the unit cost of production.
- In a situation where nominal interest rates are low, deflation could raise real interest rates, inhibiting credit-supported economic activity.
- Ultimately, deflation would increase the real debt burden of businesses and households that already hold debt, as they will be repaying the loan principal with a currency characterized by a growing purchasing power.

An example of deflation's malign effect on economic activity is shown by the experience of the United States during the Great Depression: from 1929 (stock market crash) to 1933 (the economy reaching its lowest point), the price level fell by about 25%. As a consequence, real GDP declined by about 30% and the unemployment rate increased from 4% to 25%. However, there are also examples of relatively benign deflations when economic activity expanded despite a falling price level. Hence, whether deflation is ultimately detrimental or advantageous typically relies on whether the cause behind the declining price levels is a drastic reduction in aggregate demand or a rapid acceleration in aggregate supply: both factors contribute to pushing prices downward but generate contrasting effects on the overall economic performance.

#### 2.4.2 Which monetary policies were undertaken in order to avert the risk of a deflationary spiral? (counterattack risk of deflation)

Facing a series of negative shocks, naturally central banks reacted with an arsenal of policy measures, with the purpose of generating their own opposite shocks. Given the severity of

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<sup>33</sup> Especially if a self-reinforcing negative spiral that will even amplify the fall of prices and output will be set in motion.



the financial crisis, the scale of the subsequent recession, the prolonged disruption in the supply of credit, and the high volatility in commodity prices, the fact that inflation in almost all developed countries fell barely into the negative range and remained most frequently just a few decimal points below the target was a surprisingly favourable outcome. Yet, had inflation remained negative for an extended duration, it might have led to a dangerous deflationary spiral, potentially turning an already severe recession into a much more profound depression.

Generally speaking, during an economic crisis, mostly due to rising uncertainty about the economic future, households will hold larger amounts of cash rather than spend and, on the other side, financial institutions will attempt to increase liquidity and accumulate excess reserves rather than lend. Such a shift in behaviour from economic agents tends to lower the money supply, thus exerting heavier downward pressure on economic activity and prices. For instance, during the Great Depression of the 1930s, the Federal Reserve passively allowed the money supply to contract as households and businesses placed considerable efforts to increase liquidity. As a response to the decline in money supply, the price level fell, amplifying the economic collapse. In order to bypass these previous mistakes, starting in mid-2008, the Federal Reserve took aggressive actions to prevent a contraction of the money supply by stimulating currency and bank reserves. Measures of the money stock grew substantially over the following year: during the 12 months ending in June 2009, the money stock measure M2 rose by 9,2%<sup>34</sup>.

However, for the 12 months ending in June 2010, the aforementioned monetary aggregate has increased by a much slower rate, even inferior to 2%, which could be the result of higher demand for cash balances by households and banks being less prone to utilize reserves for lending to economic agents<sup>35</sup>. Nonetheless, if such a low growth rate in money supply persisted, it would have led to an increased deflationary risk.

At the same time, central banks were quite fortunate during the peak of deflationary risks around the end of 2009 and the start of 2010, as the surge in commodity prices managed to keep inflation temporarily elevated. Despite a significant increase in slack during the recession, widespread inflexibility in nominal downward movement prevented deflation. It

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<sup>34</sup> Furthermore, unlike in the Great Depression, the Federal Reserve has aggressively carried out the function of "lender of last resort" and injected close to \$1 trillion of liquidity into the banking system, avoiding the 8000 bank collapses that emerged, instead, during the deflation of the 1930s.

<sup>35</sup> Bank lending is the principal way the economy itself creates money.

is also essential to highlight how, throughout substantial policy experimentation by central banks, expectations and trust from the economic agents remained strong. Monetary policy may have facilitated the presence of these favourable factors, yet the circumstances of the time probably played a crucial role.

#### 2.4.3 An overall comparison between the United States and the EU on deflation?

Both the United States and the European Union were deeply affected by the Great Recession and had very similar outcomes in terms of inflation (*Figure 11*, where we can highlight a comparison of consumer prices in the two areas under examination).

In particular, the graph in *Figure 11* highlights how both in the United States (*blue line*) and Europe (*red line*), the Consumer Price Index spiked in the early stages of the Great Recession (reaching almost 4% in both areas) and fell drastically to around 1% for Europe and to -0.36% for the United States. However, at the beginning of the new decade, we spot a significant rebound below 2% - the specific target selected to define price stability in the EU context.

Regarding the U.S., in addition to the real drivers of inflation (the economic downturn and trends in oil prices), two theories have been put forth to explain the deflationary trend. The first of such theories relies on anchored inflation expectations, which is a concept that suggests, in this particular circumstance, how the Federal Reserve's commitment to a 2% inflation target would force inflation expectations to remain below 2%. As the situation at that time indicated a high deflationary risk, officials from the Federal Reserve (Bernanke, 2010) and the IMF (2013) suggested raising such a target: in fact, assuming the aforementioned theory, they expected inflation not to deviate from the latter, thus lowering the risk of deflation.

The second rationale is that the relevant measure of economic slack in a Phillips curve is no longer the aggregate unemployment rate but the short-term unemployment rate. Stock (2011), Gordon (2013), and Krueger et al. (2014) all accentuate this point, where the long-term unemployed are believed to exert less pressure on U.S. prices than they did in the past. So, people who've been unemployed for a shorter time are more relevant in wage negotiations and subsequent price changes.

People often see these theories about inflation during and after the recession in the U.S. as competing explanations for such dynamics, although Ball and Mazumder (2014) provide evidence that both would be simultaneously necessary to explain the data.

In particular, their work provides evidence that a Phillips curve with both anchored expectations and short-term unemployment would explain much of U.S. inflation behaviour during the period under examination; let's now explore such concepts in detail. First and foremost, in order to explain their theory, Ball and Mazumder (2014) start by recalling the relation between unemployment and inflation according to Friedman, which defined that

$$\pi_t = \pi^e_t + \alpha (u_t - u_{t*}) + \varepsilon_t, \alpha < 0, (1)$$

where  $\pi_t$  and  $\pi^e_t$  are respectively inflation and expected inflation at a given time  $t$ ,  $u_t$  is unemployment,  $u_{t*}$  is the natural unemployment rate, and  $\varepsilon_t$  is the error term. This equation is commonly called the expectations-augmented Phillips curve and shows a negative relationship between the level of unemployment and the change in inflation. Friedman went a step further by specifying the behaviour of expectations. He said that "unanticipated inflation generally means a rising rate of inflation".<sup>36</sup> With this assumption, equation (1) becomes

$$\pi_t = \pi_{t-1} + \alpha (u_t - u_{t*}) + \varepsilon_t, \alpha < 0, (2)$$

where  $\pi_{t-1}$  is past inflation. As Stock and Watson (2010) discuss, this model captures "a broad historical regularity": in fact, traditionally U.S. recessions (characterized by higher unemployment rate) have tended to be mostly deflationary. During the Great Recession the unemployment rate again exceeded 10%<sup>37</sup>: with such an unemployment rate trend, predictions showed that inflation would have fallen below zero in 2010 and then would have continued to fall. In reality, from 2007 to 2015, the rate of core inflation (CPI excluding food and energy components) fell only from 2.3% to 2.0%. Hence, it appears natural to ask why inflation has not fallen even more during the Great Recession, as the high unemployment rate persisted at such a high level. Ball and Mazumder have tried to answer to these questions through the theory of anchored expectations:

*"Well-anchored inflation expectations have proven to be an immense asset in conducting monetary policy. They've helped keep inflation low and stable while monetary policy has*

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<sup>36</sup> Or in other words, that expected inflation is well-proxied by past inflation.

<sup>37</sup> And it returned to prerecession levels only at the end of 2015.

*been used to help promote a healthy economy. After the onset of the financial crisis, these stable expectations also helped the United States avoid excessive disinflation or even deflation", Janet Yellen (2013).*

In this perspective, equation (1), still holds, but the behaviour of expectations has changed. If, in the past, expected inflation  $\pi^e_t$  may have depended on lagged inflation, today it is close to a constant<sup>38</sup>. This idea goes in the right direction for explaining the behaviour of inflation between 2008 and 2009 and why a deflationary spiral was avoided. While, according to the traditional Phillips curve, a recession causes inflation to fall lower and lower as long as unemployment exceeds the natural rate, if we consider anchored expectations, a period of high unemployment implies a low level of inflation but not an ever-falling level. This perspective is quite helpful in order to have a broader understanding of the period under examination. For what concerns the unemployment rate, on the other hand, the traditional Phillips curve considers the aggregate unemployment rate, but a growing number of researchers started replacing this variable with the short-term unemployment rate<sup>39</sup>. The rationale for this shift is that the long-term unemployed "are on the margins of the labour force" (Krueger, Cramer, and Cho 2014). As a result, only the short-term unemployed create an excess supply of labour and put downward pressure on wage growth and inflation. Long-term unemployment rose sharply over 2008–9<sup>40</sup> and continued to be unusually high relative to short-term unemployment, even when total unemployment has returned to prerecession levels. Overall, labour-market slack since 2008 is less severe if it is measured by short-term rather than total unemployment, which also helps explaining why the drop in the inflation rate was not as dramatic as predicted by the traditional Phillips Curve.

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<sup>38</sup> Specifically, the Fed's 2% inflation target.

<sup>39</sup> Usually defined as the percentage of the labour force unemployed for less than 27 weeks.

<sup>40</sup> So, the rise in total unemployment was unusually large compared to the rise in short-term unemployment.

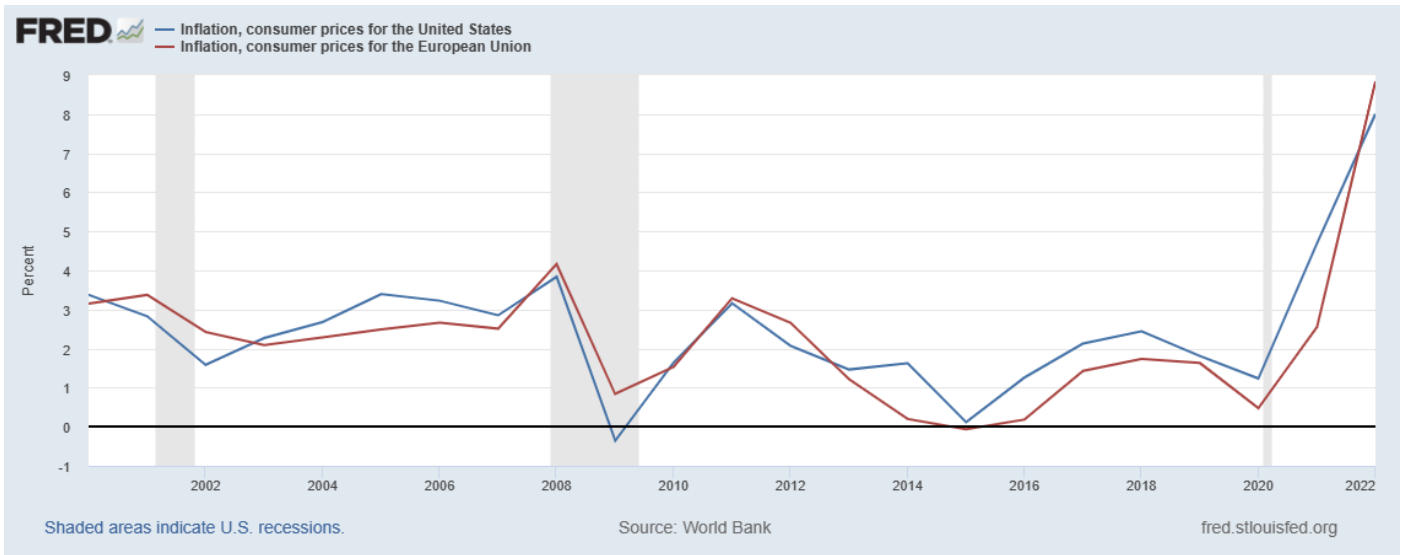


Figure 11 - Comparison between inflation in the U.S. and the EU (2000-2022)

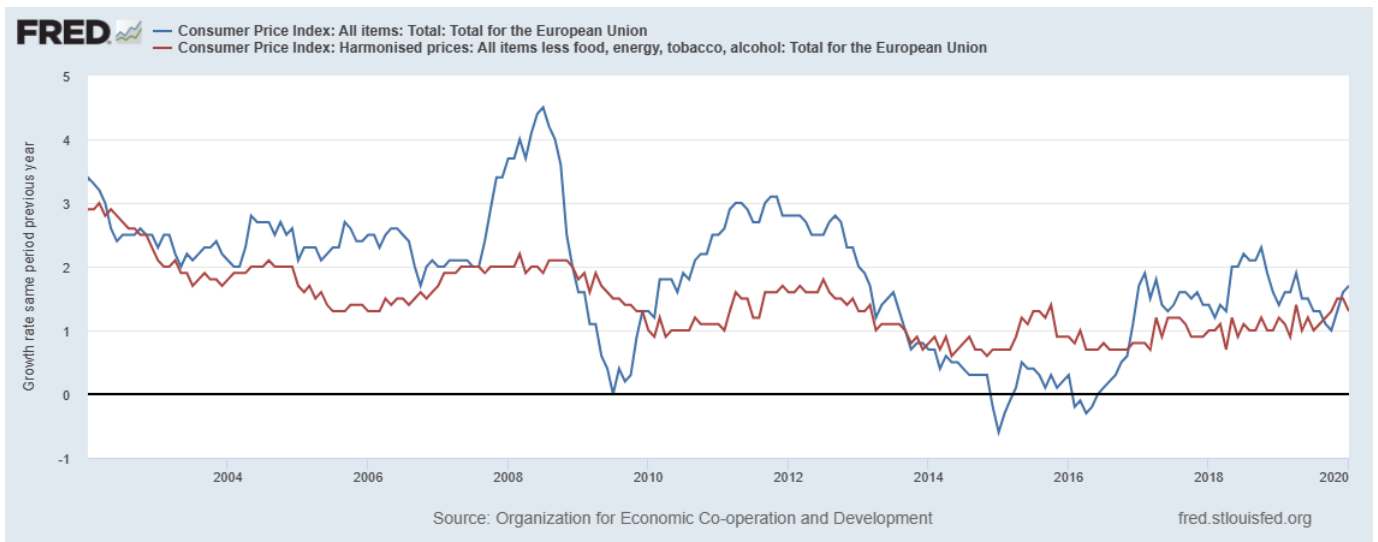


Figure 12 - Headline and core inflation for the European Union (2002 - 2020)

Concerning the EU, during the first half of 2008, there were upward movements in energy and food prices. However, in the second half of the same year, there was a moderation in the growth of food prices, while energy prices also declined substantially. Such developments had a crucial effect on inflation, which peaked at almost 4.0% (Figure 11, red line) before dropping significantly. The reasons behind such an abrupt upsurge within the first seven months of 2008 are imputable to the fluctuations in energy and food prices, which generally contribute in a crucial way to the general price level. However, in the

second half of 2008, inflation fell again due to decreases in commodity prices, reaching a level of 0.8% in 2009 (even below the 2% target).

As we can observe from *Figure 12*, which illustrates a graph where headline and core inflation overlap, we may notice how critical the food and energy components are in defining the overall price level: indeed, as it is particularly evident in the timespan between early 2008 and 2010, while headline inflation experienced sharp fluctuations (raising to nearly 4.5% and then dropping to just above 0%) due to steep movements in the prices of food and energy, core inflation has remained stable at a level of almost 2%.

Nonetheless, inflation-related issues in Europe rose particularly after 2012, when inflation persisted at a low level, stuck quite below its target of 2% (*Figure 12*). From 1999 until 2012, both headline (*Figure 12*, blue line) and core inflation (*Figure 12*, red line)<sup>41</sup> have moved likewise, centred around the ECB's target inflation rate, where headline inflation is naturally more volatile. From 1999 to 2012, excluding the Great Recession, when world crude oil prices fell (for instance, the Brent crude oil price fell by about 63%, equivalent to \$77 per barrel, from 2008Q1 to 2009Q1), both headline and core inflation appear to move closely and around the target of 2% (core inflation registered, on average, a value of 1,7%). The relationship between these inflation rates and the target was disrupted after 2012, as headline and core inflation persisted below the ECB's 2% target. At the end of 2012, a four-quarter moving average of headline inflation recorded a value of 2,3%, and it fell to close to 0% by the end of 2015. Core inflation moved from 1.6 to 0.9% over the same period. The mean inflation rates for 2013–2015 are 0,4% (headline) and 0,9% (core).<sup>42</sup>

The literature proposes two interpretations of excessive disinflation, focusing specifically on headline inflation: domestic factors through aggregate demand and external factors through supply shocks (specifically, world oil prices). For instance, Halka and Szafranek (2015) argue that the decline in European inflation in 2013 and 2014 can be related to positive supply shocks through declining oil and food prices; however, it can be argued

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<sup>41</sup> Headline inflation estimates the total inflation within an economy, encompassing all goods and services. It includes changes in the prices of energy, food, commodities, housing, transportation, and any other goods and services consumed by consumers and businesses; it is susceptible to temporary price changes, such as those provoked by fluctuations in energy or food prices. It delivers a comprehensive view of the overall price movement in an economy. On the other side, core inflation excludes volatile components that can generate momentary price changes from the overall inflation calculation; it typically excludes food and energy prices, as they tend to be more prone to short-term variations due to, for instance, weather conditions, geopolitical events, or supply disruptions. Core inflation seeks to reveal the underlying, more persistent trend in price movements, providing a more stable indicator of long-term inflationary trends.

<sup>42</sup> As we can observe from the graph in *Figure 10*, headline inflation falls below core inflation.

how core inflation, which excludes food and energy components, also declined substantially. On the other hand, Landau (2014) claims that the reason behind low inflation in Europe could have been low aggregate demand. He moves from work done by Caballero and Farhi (2013) to dispute that there has been an excess demand for 'safe assets', which has led to economic agents holding money and government bonds in preference to other financial assets. As a result, this has led to lower consumption, which, in turn, has exerted more deflationary pressure. Conti et al. (2015) find that both factors (domestic and foreign demand shocks) have been the main drivers of EU inflation. Specifically, they observe that the oil supply explains rising inflation in the first half of 2008, while it did not play as large of a role in the subsequent disinflation. For the 2013-2014 period, where EU inflation fell substantially, the authors argue that oil prices and aggregate demand shocks are both causes. In addition, they find that the zero lower bound on nominal interest rates also contributed to falling inflation. However, the critiques presented by Constancio (2015) claim that domestic and foreign factors played different roles at different times, as oil prices were most significant immediately after the recession, while, in the subsequent years, domestic factors were more relevant. The ECB (2017) also states that the excessive disinflation puzzle in Europe after 2012 can be explained by both domestic factors (in the early period) and global factors (afterwards). Thus, the current literature on the puzzle of excessive euro area disinflation since 2012 has attributed both domestic and foreign factors to varying degrees.

CHAPTER 3 – Which are the main drivers of inflation in the present day? Is the current situation somehow resembling what happened during the 1970s? How has the monetary policy response unfolded? How could the future perspectives in the short- and medium-term be?

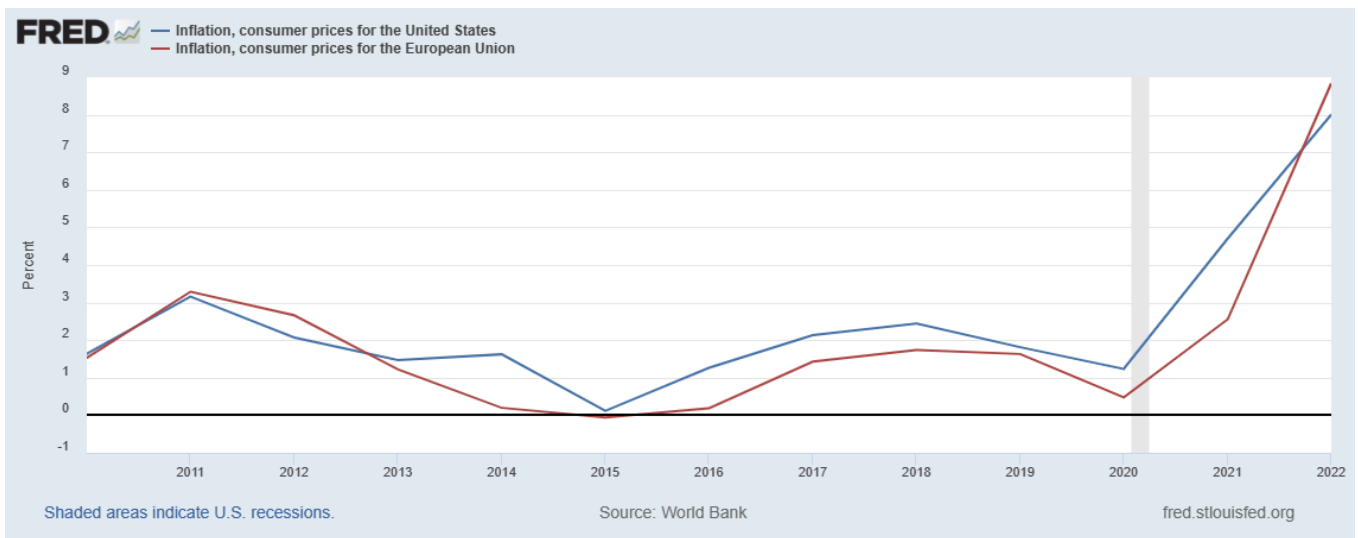


Figure 13 - Inflation for the United States and the EU (2010 - 2022)

### 3.1 Introduction

The coronavirus (COVID-19) pandemic shock required lockdowns and containment measures at a global level<sup>43</sup>, which implied the shutdown of businesses and/or an increase in costs for certain sectors. Such a shock was multidimensional, stemming from both external and domestic sources, hitting both demand and supply and affecting both the aggregate and the sector-specific level. At the same time, the pandemic shock was countered by an unprecedented policy response both at the national and the supranational level. In combination, all of this has led to a considerable increase and a higher volatility of inflation, especially in the euro area.

The inflationary wave that began to spread globally in 2021 marked the most significant inflationary shock since the era of the "Great Inflation," during which consumer price growth rates in developed nations soared to double-digit levels.

If we investigate the data (Figure 13), we can better define the acceleration of inflationary processes that have affected the majority of countries: in 2021 and 2022, the growth rate

<sup>43</sup> The first case of infection by the SARS-Cov-2 virus was detected in December 2019 in the Chinese city of Wuhan, and by early spring of 2020 the global pandemic had generated a world economic crisis.



of consumer prices in G7 countries was at the level of 7.4% and 5.6% respectively, while the average rate of inflation of the same countries in the period 2010–2018 was only around 1.5%. In particular, in the United States the rates were at 7.0% and 6.5% in 2021 and 2022 – compared with 1.8% in 2010–2019, and in the Eurozone they were standing at 5.0% and 9.2% – compared with 1.3%, registered during the previous decade. At its peak, inflation in the USA hit the double-digit threshold and, in the Eurozone, it was even higher<sup>44</sup>. It's crucial to highlight that the recent spike in inflation was unusual for developed nations; on the other hand, such fluctuations are more common in emerging markets due to their typically higher average inflation levels and ongoing challenges in achieving price stability. While some exceptions exist, like Chile and Colombia, which implemented inflation targeting strategies and measures to control inflationary trends a few years ago, even these countries struggled to counteract the global shock of 2021–2022 and to contain inflation below 10%.

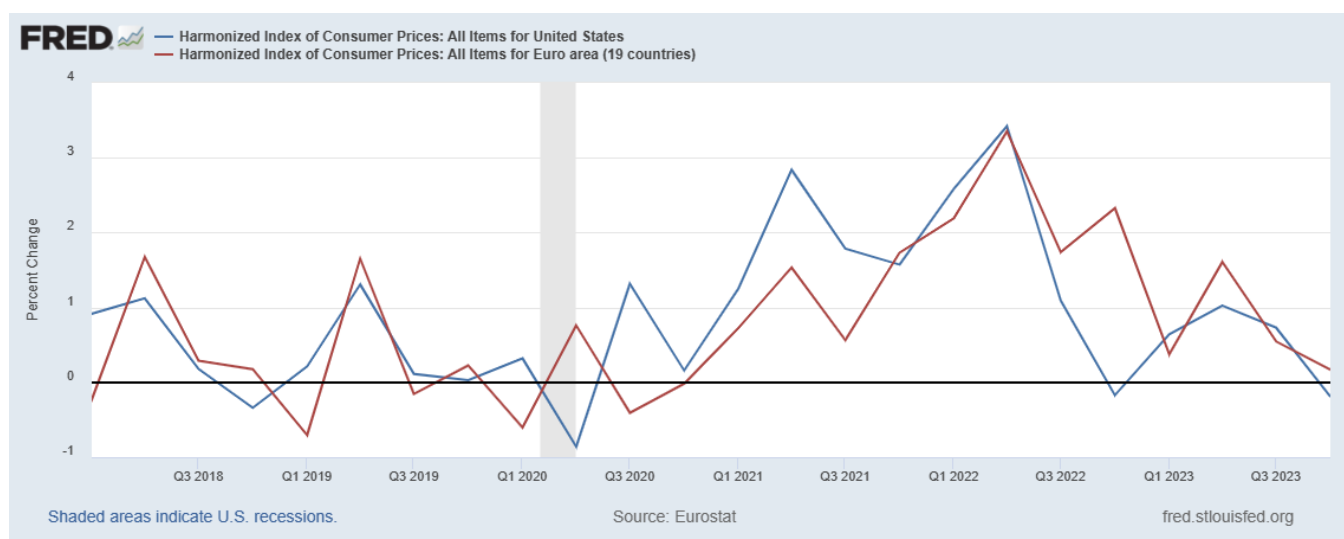


Figure 14 - HICP for the United States and the EU (2018 - 2023)

As it can be observed in Figure 14 above, the Harmonised Index of Consumer Prices (HICP) had similar dynamics both in the United States and the Eurozone in the period represented: it was standing slightly above 1% in both cases until mid-2019<sup>45</sup> before falling close to zero and being even negative throughout 2020, just before increasing again close to 1.5% for Europe and at even almost 3% for the United States. Since that first peak the HICP increased

<sup>44</sup> An increase in prices that, in developed countries, has not been experienced since the 1980s.

<sup>45</sup> At, respectively, 1.65% in Europe and 1.31% for the United States.

particularly sharply, despite a minor setback, reaching a historical high at the beginning of 2022 for both the EU and the United States.

In both cases, the initial decline in HICP-measured inflation in 2020 was primarily attributable due to a fall in the contribution of energy inflation (resulting from collapsing oil prices), but the dynamics of aggregate supply and aggregate demand, which will be thoroughly examined in the next paragraph, played a significant role as well. Headline inflation fell further in the second half of the year as HICP inflation excluding energy and food (HICPX) also increasingly contributed to the disinflationary tendencies, mainly owing to a decline in services inflation and, to a lesser extent, a decline in non-energy industrial goods (NEIG) inflation.

From January 2021 on, inflation showed a strong upward trend, which led to a historical peak in mid-2022: while energy inflation played a key role in this upward trend since Q42021, higher NEIG and services inflation as well as higher food inflation more recently have also been crucial.

As we have explored in the previous chapters, abnormally high inflation rises several issues in terms of world economy and monetary policy. With this respect, in particular, it's important to remember that, if maintaining loose monetary conditions supports the recovery of economic growth, it also has side effects<sup>46</sup>. On the other side, however, tightening monetary policy will result in a slowing down of economic growth. During the last ten years, central banks of developed countries have tried to increase inflation to a target level, and steadily enter the zone of positive policy rates; but, despite this, the inflation rates have remained at low levels. Consequently, when in 2021 inflation began to accelerate, regulators were taken by surprise and were slow to adjust monetary policy; they did not curtail policies of quantitative easing and held interest rates close to the lower bound, even when the unprecedented scale of the inflationary shock became evident. In such macroeconomic conditions, several questions arise. How is this crisis developing across the main global economies? What were the causes of this recent inflationary shock and which could be its main drivers? What was the response from a monetary policy perspective? What will be the future inflationary developments? These are the topics that will be discussed in the following paragraphs.

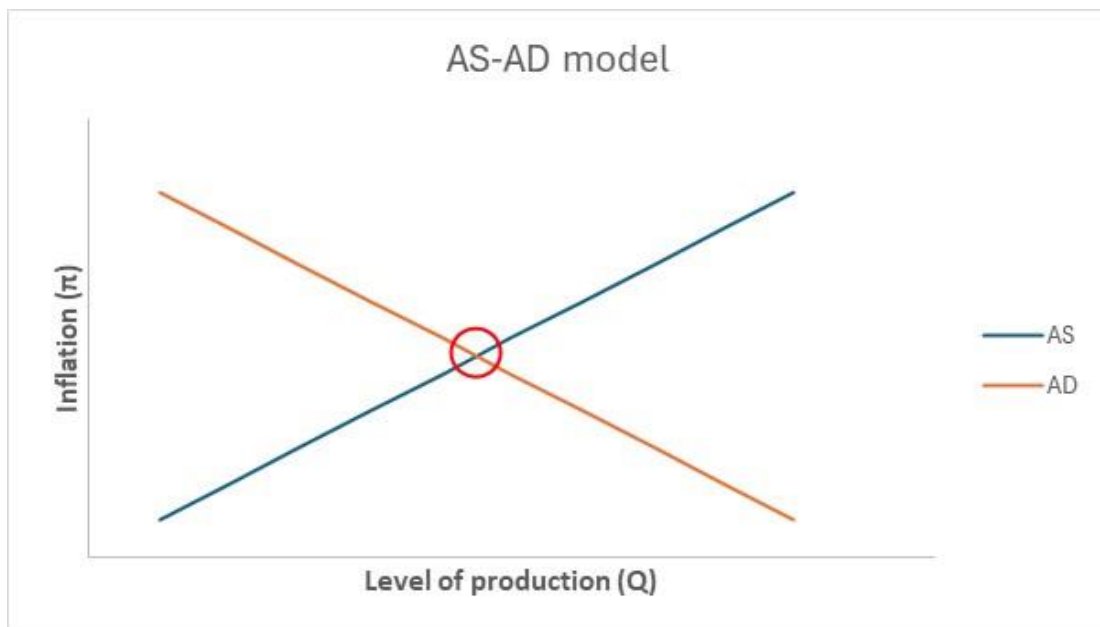
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<sup>46</sup> There are risks of losing control over prices, de-anchoring of inflation expectations, and falling into the stagflation trap, escape from which is always challenging.

### 3.2 Aggregate supply and aggregate demand dynamics: a first interpretation of the recent inflationary wave

While the energy shock played a major role in curbing inflation in 2022, as it will be analysed in the next paragraphs, on the other hand, demand and supply contributed to crucially shaping inflation and output. In particular, the AS-AD model can help us understand why, during the first two quarters of 2020, we could surprisingly witness a slowdown in inflation.

Therefore, let's start with the standard AS-AD model (reported below in *Figure 15*), which identifies a starting level of inflation ( $\pi$ ) and production ( $Q$ ).



*Figure 15 - Aggregate Supply and Aggregate Demand model*

During the first months of the COVID pandemic, as represented in the graph in Figure 16, there was a contraction in both Aggregate Demand and Aggregate Supply, which shifted from AD to AD' and from AS to AS' (meaning a recession with a lower level of inflation). Indeed, during the first months of the pandemic, governments implemented measures aimed at containing the number of COVID-19 cases registered, and such measures resulted in a sharp contraction in industrial production; on the other hand, aggregate demand also slid to the left, meaning that aggregate consumption increased and aggregate saving rose. The final result is due to the fact that the entity of the contraction in aggregate

demand is more significant compared to the one of aggregate supply (if not, we would have witnessed inflationary effects instead).

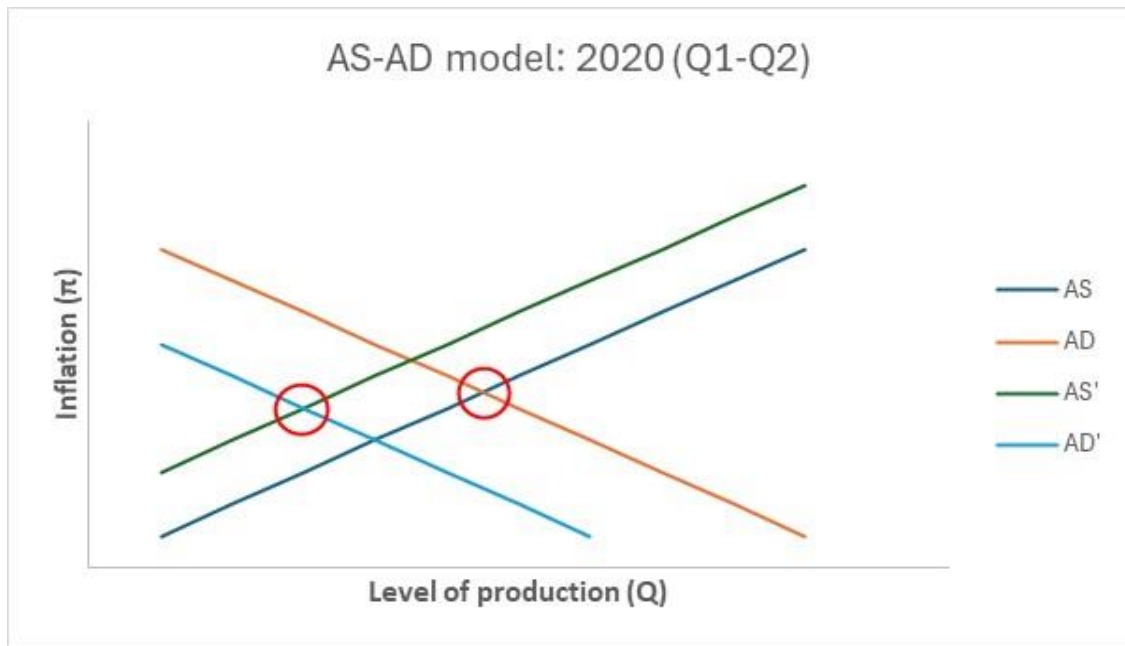


Figure 16 - Aggregate Supply and Aggregate Demand model during the first months of the COVID-19 pandemic crisis

In late 2021, there was a shift in dynamics, which had a favourable effect on both Aggregate Demand (as private and public consumption dramatically rebounded after the sharp contraction) and Aggregate Supply (despite the difficulties related to the global supply chain bottlenecks and goods and labour shortages). AD' shifts to AD'', while AS' shifts to AS'' (Figure 17): we can observe that the expansion of Aggregate Demand is more significant than Aggregate Supply. Consequently, the level of production almost returned to pre-Covid levels, accompanied by a moderate rise in inflation, which, while notable, did not reach alarming levels.

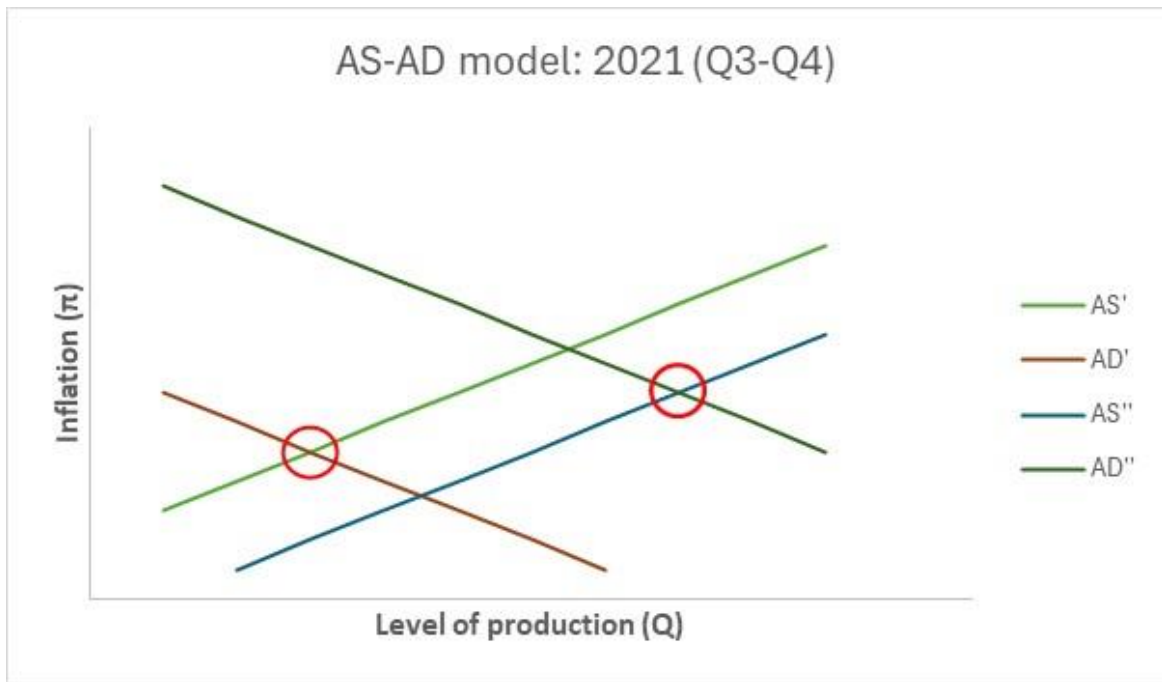


Figure 17 - Aggregate Supply and Aggregate Demand model during the "rebound" in late 2021

The last phase under examination using the AS-AD model relates to the hit of the energy shock in early 2022 (the outbreak of the Russian invasion of Ukraine). Here, Aggregate Supply and Aggregate Demand are not synchronised: we see an expansion in the latter (from  $AD''$  to  $AD'''$ ), which does not match the sharp contraction of the former (from  $AS''$  to  $AS'''$ )<sup>47</sup>. This is reflected, as shown below in *Figure 18*, in a level of production comparable to the one registered pre-COVID, but with a much higher inflation.

<sup>47</sup> Due to the deep energy shock that has affected specifically the European context.

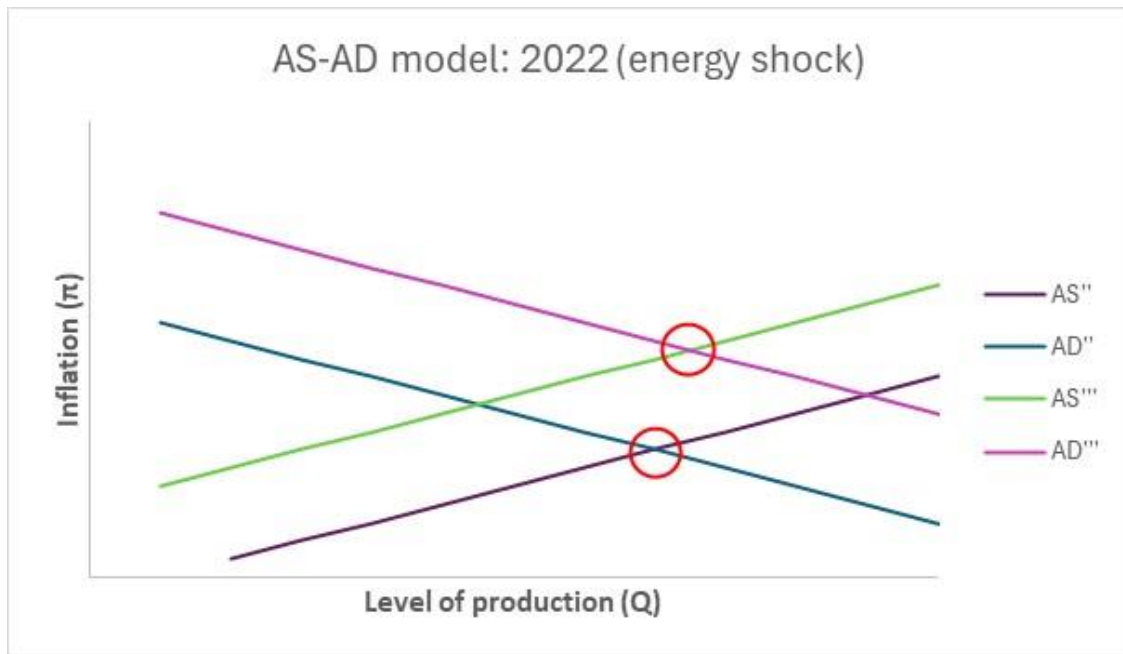


Figure 18 - Aggregate Supply and Aggregate Demand model in early 2022 (energy shock due to the outbreak of the Russia-Ukraine conflict)

### 3.3 A focus on the current inflationary trend in Europe and the role played by the Russia-Ukraine conflict

As examined in the paragraphs above and how it is shown in *Figure 13*, between late 2020 and early 2021, there was a notable surge in inflation (and especially in headline inflation). Such an increase was primarily driven by a series of energy price shocks (which again prove to be an important driver of the price level), alongside global supply bottlenecks and the effects of reopening economies, all of which contributed to inflationary pressures, which proved to be more enduring than initially anticipated by many forecasters. Inflation in the Eurozone was significantly boosted by the Russian war in Ukraine: oil prices increased since the beginning of the conflict, peaking at over \$122 per barrel in June 2022; however, oil and gas price future curves suggest a decline in energy prices, implying also sharp declines in energy inflation looking ahead. On the other hand, the conflict between Russia and Ukraine could potentially moderate inflation through the adverse impact on economic growth in the euro area, but any such effects are expected to be counteracted by indirect consequences stemming from increased energy prices resulting from the conflict. Nevertheless, the aforementioned conflict has naturally increased uncertainty.

### 3.4 Do oil prices also have a leading role in curbing inflation? Let's analyse the energy component as well as other crucial factors.

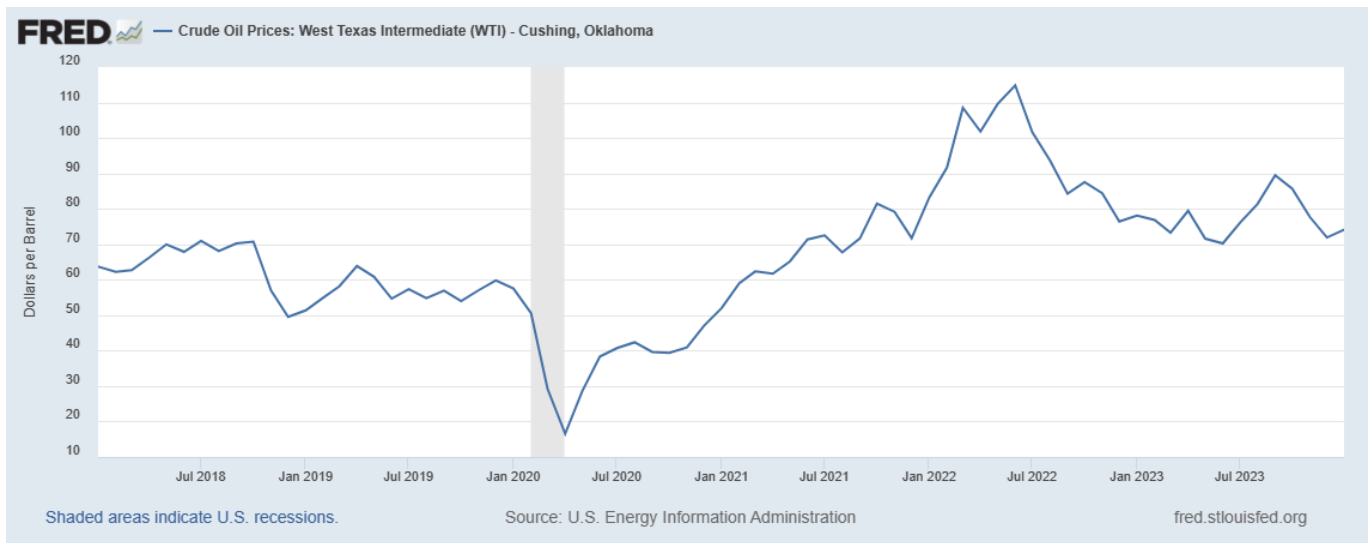


Figure 19 - Oil Prices in the United States (2018 - 2023)

As it is shown above in *Figure 19*, oil and gas prices fell sharply at the onset of the pandemic: such a large drop (highlighted in the gray area) reflected mainly the negative impact of the pandemic on energy demand (Koester and Rubene, 2021). As a consequence, we could observe a steep decline in the rate of change of the HICP energy, which reached a level of -11,9% in May 2020<sup>48</sup>, and HICP energy inflation contributed negatively to headline inflation through most of 2020. However, since mid-2020, energy prices started to rise again as global demand recovered and supply constraints, especially on the gas market<sup>49</sup>. As a consequence of such an increase, HICP energy surged from its negative level in May 2020 to 28.8% in January 2022<sup>50</sup>.

As for the first months of 2022, data suggest that the contribution of gas and electricity prices to HICP energy inflation has increased further.<sup>51</sup> The conflict between Russia and Ukraine has led to a significant increase in energy prices and energy-related inflation, reaching a new historical peak of 32% in February 2022. This has also heightened uncertainty regarding

<sup>48</sup> A historically low level not seen since 2009.

<sup>49</sup> Reaching the pre-pandemic level only at the beginning of 2021 and hitting a peak in mid-2022, as shown in the graph.

<sup>50</sup> With base effects linked to the previous collapse of oil prices contributing around ten percentage points to HICP energy inflation

<sup>51</sup> Overall energy inflation accounted for more than half of headline inflation in February 2022.

the future trajectory of energy prices and inflation more broadly. Higher energy commodity prices also feed in through the pricing chain via higher input costs to food, non-energy industrial goods and services (Koester et al., 2021a).

The rising energy costs have likely contributed to increases in food inflation and non-energy industrial goods (NEIG) inflation<sup>52</sup>. However, this process takes time and unfolds gradually over the course of years, suggesting that the increase in energy prices is likely to eventually drive up both food prices and underlying inflation in the future.

Currently, the majority of inflation in the euro area stems from external shocks, primarily originating from net imports of energy and commodities, or through the import component of other goods and services. This can be demonstrated by breaking down HICP inflation into energy and food components, as well as items with high and low import content. Inflation in items with low import content, where domestic price pressures are predominant, has been significantly lower compared to overall HICP. This differs from the pre-pandemic period, during which inflationary shocks were more evenly distributed (Nickel, Christiane; Koester, Gerrit; Lis, Eliza – 2022).

Furthermore, it is also critical to consider the exacerbation of the regressive effect of inflation, specifically produced by the energy shock being a crucial driver of the 2021-2022 inflationary wave. Indeed, as will be examined in the last chapter of the discussion, the imported nature of the inflationary shock, together with the relevance of the surge in its energy component, has severely impacted households (in terms of widened inequality), thus raising the need to implement fiscal policy in order to face such an issue.

### 3.5 Similarities and differences with the 1970s; what can we learn from the Great Inflation?

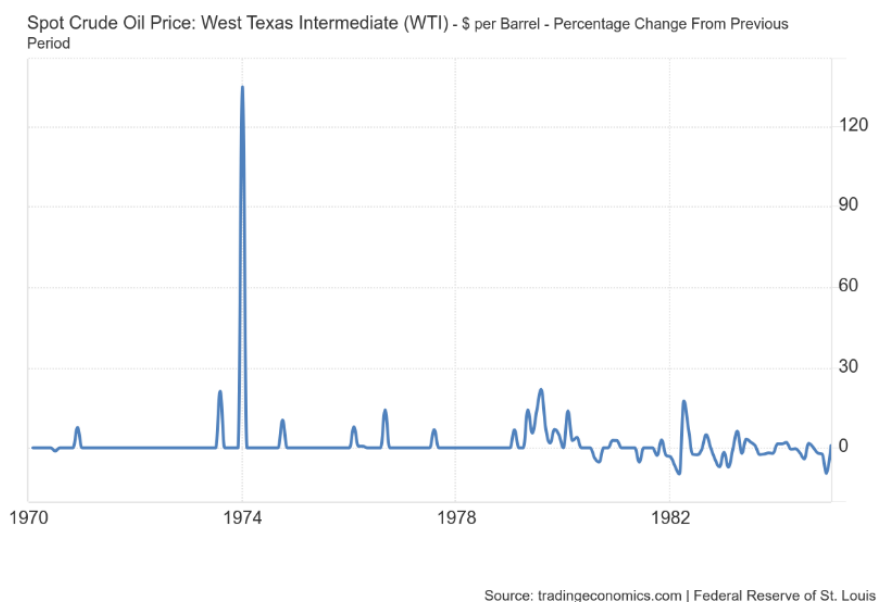
In light of the experience of the 1970s, it is possible to define some similarities and differences with the recent and current inflationary experience. First of all, one aspect that characterized the Great Inflation of the 1970s was supply disruptions, caused by the oil shocks hitting in 1973 and during 1979-1980, which seem to resemble the recent supply shocks originating from the war in Ukraine. A second element that needs to be stated is how similarly, in the previous and current experience, monetary policy was highly accommodative, when the shocks were in the process of building up. After several months

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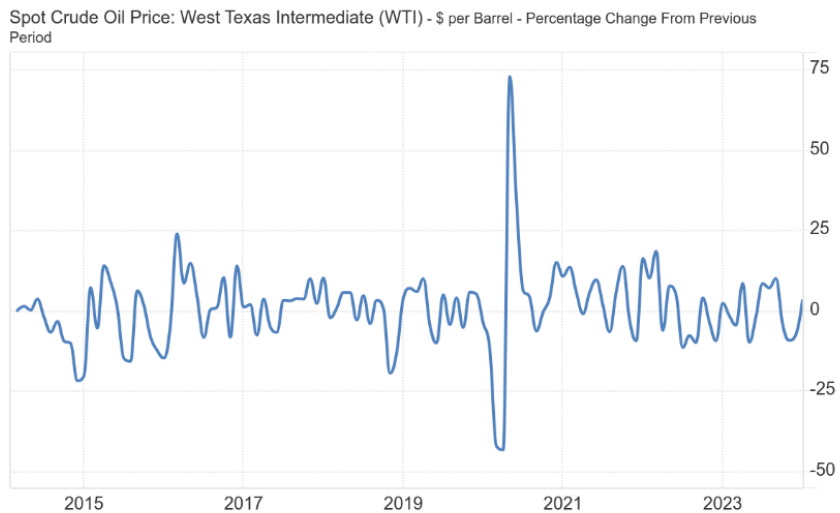
<sup>52</sup> Which stood at 4.1% and 3.0% respectively in February 2022.



of above-target inflation in major advanced economies, a steeper-than-anticipated policy tightening might now be required to return inflation to target – and this might trigger a hard landing similar to that of the early 1980s (Blanchard 2022, Summers 2022, Gagnon 2022). While the aforementioned are valid points, significant differences between the current situation and the 1970s still persist: indeed, in terms of the magnitude of the rise of commodity prices, the current situation appears more favourable compared to the previous one. If, in the wake of the oil shocks, oil prices nearly quadrupled in 1973-74 and doubled in 1979-80, today they are, in real terms, still only around two-thirds of those in the 1970s (as it is noticeable comparing the graphs reported below in *Figure 20* and *Figure 21*). Another aspect that is crucial to stress is how, since the 1970s, there has been a significant change in monetary policy frameworks: until the Great Inflation crisis, central bank mandates tended to incorporate various and competing goals – output, employment and price stability, instead of majorly focusing on the latter one, as it happens today.



*Figure 20 - A highlight of oil prices in the United States during the Great Inflation*



Source: tradingeconomics.com | Federal Reserve of St. Louis

Figure 21 - A highlight of oil prices in the United States during the pandemic crisis

Most central banks in advanced economies, freed in 1971 from the constraints of the Bretton Woods system of fixed exchange rates, aimed to support economic activity with monetary expansion, without realising that potential output growth had started to slow (de Long 1997). However, over multiple decades, this “passive” way of conducting monetary policy ultimately resulted in rising inflation, which policymakers tended to attribute to special factors, underestimating the pervasive and lasting impact of excess aggregate demand pressures (Blinder 1982). As a consequence, global median inflation started the 1960s at a low 1.5% but then trended up rapidly throughout the decade, reaching a level above 5% in the 1970s and culminating at nearly 14% in 1980.

In order to prevent such situation from occurring again, central banks in advanced economies currently possess well-defined mandates emphasizing price stability, often articulated through explicit inflation targets. They have implemented transparent operational protocols, publicly disclosing and rationalizing their decisions regarding policy rate adjustments. Hence over the past three decades, they have established a credible track record of achieving their inflation targets (Bordo et al. 2007, Eichengreen 2022). As a result of such improvements in policy frameworks and better anchored inflation expectations, inflation – in particular, core inflation – has become much less sensitive to inflation shocks (Ha et al. 2022). An additional feature by which the present experience differs from the Great Inflation is that, as for the former, inflationary surges have primarily

affected few energy-intensive and pandemic-impacted sectors<sup>53</sup>. This differs from the situation in 1979–80, when the acceleration in inflation was widespread, characterized by similarly high inflation rates spanning across nearly all sectors. Hence, inflation in some sectors is expected to decline once supply disruptions ease and commodity prices stabilise (Borio et al. 2022, Ilzetzki 2022).

Eventually, aggressive monetary policy tightening in the late 1970s and early 1980s sharply reduced inflation in advanced economies and established central bank credibility, although often at the cost of deep recessions<sup>54</sup> (Goodfriend 2007). So far, monetary policy restrictions have played a crucial role in reducing the current inflationary spike; in the short- and medium-term it will be possible to assess if, on this aspect, there will be a similarity or a difference among the present time and the 1970-80s.

Furthermore, what is important to add is that, in light of the Great Inflation and especially in the European economies, central bank mandates set a higher priority on price stability (the 2% target for both the ECB and the Federal Reserve) and learned to respond in advance to rising inflation<sup>55</sup>. These represent probably the main takeaways from the Great Inflation experience, that have outlined and oriented monetary policy thus far.

### 3.6 The monetary and fiscal policy approach entering the pandemic crisis: an overview of the situation during the last decade (2010-2019).

The years 2010–2019 were quite remarkable in developed countries, which witnessed a combination of policies of economic stimulus and a relatively restrained dynamic of major macro-economic variables<sup>56</sup>. Throughout the 2010s, central banks in major economies set the policy rates generally below 1.25%<sup>57</sup> and, in order to stimulate the economic activity, they also implemented major asset purchases.

For what concerns fiscal policy, right after the Great Recession public budget deficits rose significantly in most developed economies and, as a consequence, public debt also grew

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<sup>53</sup> Although inflationary pressures may be expanding recently, as well.

<sup>54</sup> In the US, for example, short-term interest rates almost quadrupled between the end of 1976 and mid-1981. In the wake of these interest rate increases, US output contracted by more than 2% between early 1981 and mid-1982.

<sup>55</sup> As a result, in several of these economies, the inflation cycle during the 1970s was less pronounced than in the United States, but still accompanied by recessions in the early 1980s.

<sup>56</sup> Despite the adoption of highly stimulative macroeconomic policies by governments and monetary authorities in developed countries, this did not result in destabilization or overheating.

<sup>57</sup> With the exception of the United States and Canada, where interest rates briefly ranged between 2.0% and 2.5%.

abruptly. By the middle of the decade, fiscal policy parameters began to return to the pre-crisis levels, although governments did not seem to prioritize the achievement of fiscal surpluses as a primary goal.

A notable aspect of the past decade was the limited correlation between inflation and key economic indicators such as unemployment, the output gap, and GDP growth rates, which represents a significant change compared to the predominant situation in the decades preceding the economic crisis of 2008–2009.

As for the economic growth in developed countries, at the beginning of the decade, the output gap was standing at a quite high level<sup>58</sup>; as inflation was also remaining at a minimal level<sup>59</sup>, there was the generalized concern that such economies would follow the example of Japan, characterized by low economic growth rate and inflation<sup>60</sup> for over a decade (economic stagnation) and with a limited possibility for the government to stimulate economic growth, due to the zero lower bound of nominal interest rates (Fukao et al., 2015). With the risk of stagnation at stake, the goal of making inflation return to target level and preventing the economy from sliding towards zero interest rates and deflation became a priority, hence the economic policy was targeted on growth. Before the global crisis of 2008–2009 the consensus was that the priorities of economic authorities should be the smoothing out of cyclical fluctuations in the economic activity, avoiding excessive acceleration of inflation and supporting fiscal sustainability (Goodfriend, 2007; Arestis and Sawyer, 2004). Based on such considerations, a system of macroeconomic regulation was constructed, under which the major concern of economic policy was to keep high budgetary and monetary discipline, based on transparent decision-making and rule-based policy (Clarida et al., 1999; Bernanke et al., 2000; Taylor, 2000; Wyplosz, 2005). However, during the 2010s, there was a shift in the comprehension of macroeconomic risks among economic authorities of developed nations and analysts within research institutes. In the expert community the idea of a “new normal” became widespread, by which the combination of low inflation, nominal interest rates that were close to zero, accompanied by an active use of so-called non-conventional monetary tools, high levels of employment, and moderate economic growth rates was meant (Williams, 2017; Lombardi et al., 2018; ECB, 2014).

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<sup>58</sup> At around 4%, slowly decreasing and returning to the pre-crisis levels only in 2018.

<sup>59</sup> Lower than the target of 2%, as it is shown in Figure 13, especially after 2012.

<sup>60</sup> Almost tending to deflation.

Hence, throughout the period spanning 2010 to 2019, economic authorities and experts reassessed their perspectives regarding the risks associated with implementing expansionary macroeconomic policies, concluding that, under conditions of weak demand, aggressive stimulus measures would not result in significant destabilization. As economic growth rates were persisting at a low level, authorities became increasingly prepared to pivot towards ultra-expansionary monetary and fiscal policies in order to avoid or, at least, mitigate the effects of a recession. Such an approach became relevant as such countries faced the recent economic crisis triggered by the global pandemic in 2020: indeed, these governments promptly enacted measures characterized by unprecedented levels of monetary easing and fiscal stimulus<sup>61</sup>.

### 3.7 How the European Central Bank and the Federal Reserve are respectively coping with high inflation rates

For what concerns monetary policy conducted by the ECB, it started being more restrictive since mid-2022. Let's briefly recall that the main monetary policy instruments used to adjust monetary policy in the Euro area are mainly the interest rates set by the central bank, which are the main refinancing rate<sup>62</sup> and the marginal lending and deposit rate at the central bank<sup>63</sup>; other instruments that are used by the ECB to control monetary policy are the open market operations <sup>64</sup> (OMO) and the mandatory reserve requirement (currently set at 1%). As shown in *Figure 22*, the ECB responded to the inflationary trend by adjusting its policy rates, which rose by a cumulative amount of 450 basis points<sup>65</sup>.

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<sup>61</sup> This proactive approach underscored a fundamental evolution in economic policy-making, as authorities embraced a more interventionist stance to mitigate the adverse effects of the economic crisis that arose out of the global pandemic.

<sup>62</sup> Which sets the benchmark for monetary policy.

<sup>63</sup> Which are both overnight rates and define the upper and lower limit of the interest rate corridor.

<sup>64</sup> Transactions conducted by the central bank in the interbank market with the aim of supporting the national currency.

<sup>65</sup> Such an increase has been the most significant since 1999, when the Main Refinancing Operations (MRO) rate also was raised by 450 basis points, while in 2005 the rates were raised by 425 basis points.

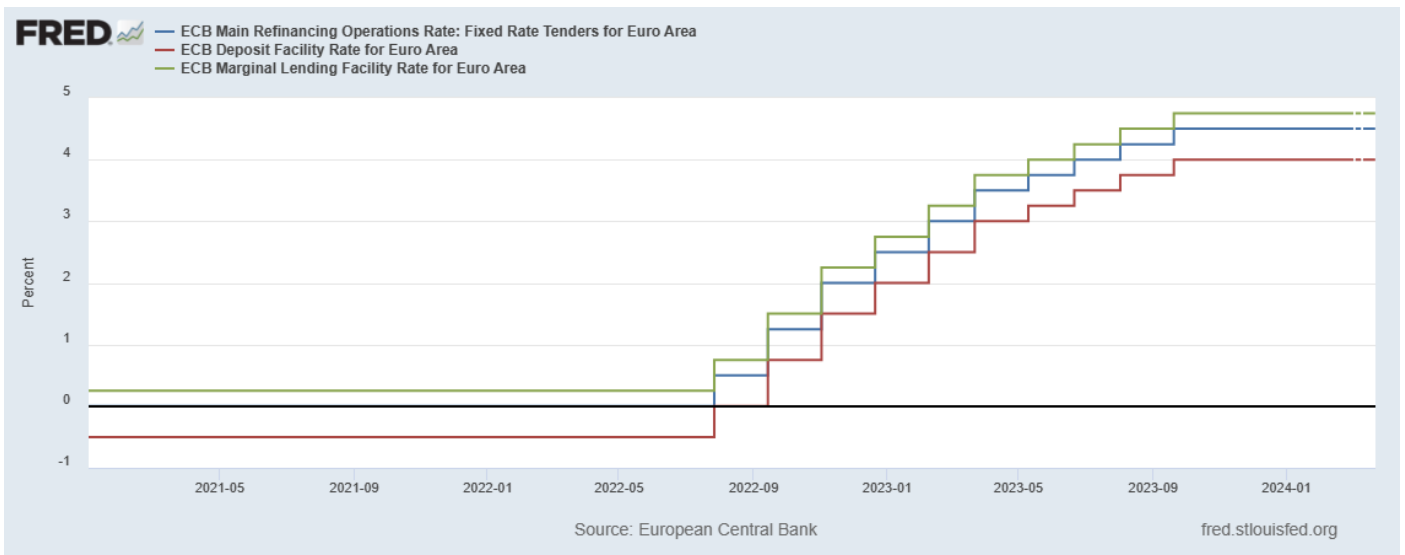


Figure 22 - Main Refinancing Operations Rate, upper and lower bound (2021-2024)

However, raising policy rates was not the only tool utilized in order to face the recent inflationary wave: in fact, the ECB had conducted actions aimed to reduce the size of its balance sheet and to drain the excess liquidity in the Eurosystem. In particular, Targeted Longer-Term Refinancing Operations (TLTRO) and Asset Purchase Programs (APP), which were implemented during the Financial Crisis, were interrupted<sup>66</sup>.

Such operations managed to significantly reduce the Eurosystem's balance sheet (*Figure 23* shows the reduction in the ECB assets); furthermore, excess liquidity has also declined by € 1.2 trillion.

<sup>66</sup> Meaning that the ECB stopped reinvesting the proceeds from its purchased and maturing assets and providing long-term loans to eurozone banks at favourable interest rates, thus leading to a reduction on its balance sheet and to a contraction in excess liquidity.

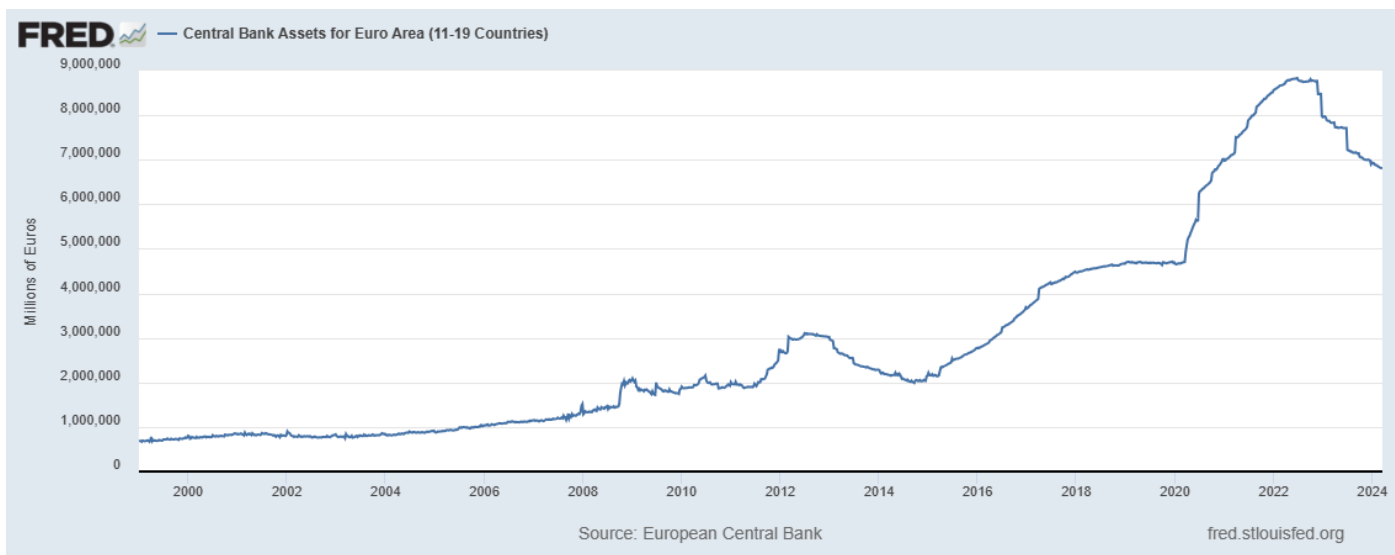


Figure 23 - ECB Assets (money aggregates) growth (1999-2024)

Since late 2022, it seems that such measures are achieving the intended results. At the same time, the recent decline in energy prices, particularly natural gas, along with the easing of bottlenecks, is expected to also lower inflation expectations.

However, it is also crucial to stress some of the possible risks connected to the implementation of such policies as, for instance, the volume of the money aggregates, primary assets of the central bank, is decreasing remarkably: M3 is sensitively decreasing (3.5% in January 2023 on an annual basis, from 6.3 in September 2022) and M1 growth became negative in January 2023 (-0.7%, a historical minimum). If prolonged, the decline in money supply and the consequent immobilization of funds in more illiquid forms of savings, could limit both consumption and investment, potentially leading to an excessive reduction in short-to-medium-term inflation expectations<sup>67</sup>.

As for the monetary policy carried out by the Federal Reserve, it is important to highlight how recently there has been a shift, operated by the Federal Open Market Committee (FOMC) from a very accommodative stance of monetary policy to a restrictive one. The tools that have been primarily used are the target range for federal funds rates and the balance sheet policy<sup>68</sup>.

As it can be observed in *Figure 24*, consistently from March 2022 to May 2023, the FOMC raised the target range for the federal funds rates, initially at a slower pace (25 basis points

<sup>67</sup> And, hypothetically, pave the way to a deflationary wave.

<sup>68</sup> Hence, we might notice a resemblance with the way in which the ECB conducted monetary policy in order to face the inflationary wave.

on each meeting), moving to larger increases (75 basis points in the meetings of June, July, September and November 2022), aiming to contain and even reduce inflation. As in the first half of 2023 inflation was still above the 2% target set by the FOMC, the target range for the federal funds rate was still increasing – however, at a slower pace compared to the one that was experienced in 2022. After the June 2023 meeting, the target range was set at 5–5¼%.

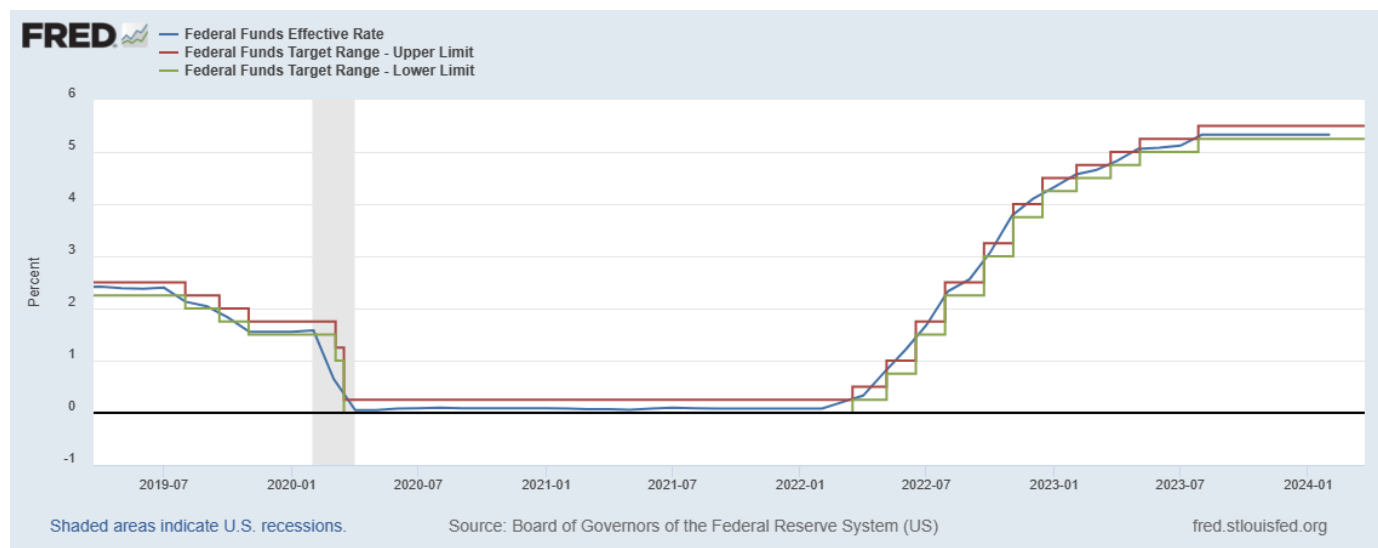


Figure 24 - Federal Funds effective rate, upper and lower bound (2019-2024)

Despite the major focus in conducting monetary policy was set on the target range, important measures regarding balance sheet policy were also put in place. In Figure 25, there appears to be a complete shift since early 2022: if, during the pandemic, the FOMC had boosted assets purchases, with the purpose of injecting liquidity into the economy and stimulating economic growth, it became clear the need for a reduction in the size of assets. Hence, in January, the Committee outlined a series of Principles for Decreasing the Size of the Federal Reserve's Balance Sheet. Subsequently, in May, it announced plans to substantially reduce the Federal Reserve's balance sheet in accordance with those principles.



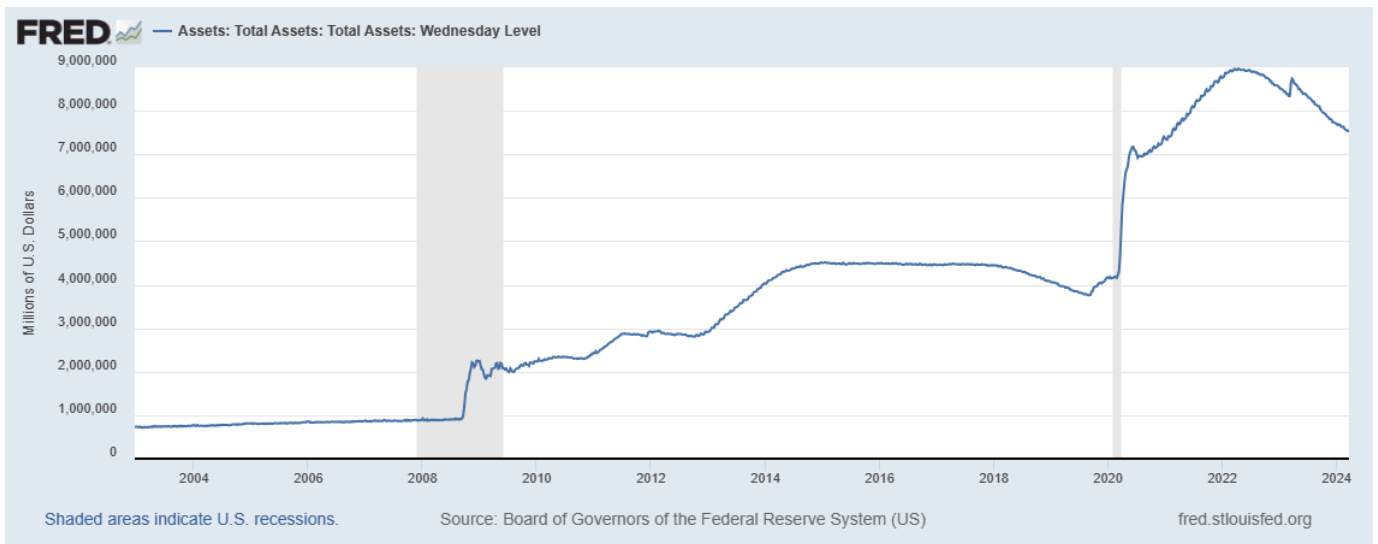


Figure 25 - Federal Reserve Assets (money aggregates) growth (2002-2024)

In mid-2023, in determining the extent of additional policy firming that would be appropriate to return inflation to 2% over the medium-term, the FOMC planned to “consider the cumulative tightening of monetary policy, the lags with which monetary policy affects economic activity and inflation, and economic and financial developments.” and indicated that it would “continue to monitor the implications of incoming information for the economic outlook ...[and] would be prepared to adjust the stance of monetary policy as appropriate if risks emerge that could impede the attainment of the Committee's goals<sup>69</sup>.” Despite there has been a significant reduction in inflation, the path forward is still quite uncertain.

### 3.8 An overview of some of the possibilities for the future developments

As mentioned above, as a result of the monetary policy measures that were undertaken in order to face the crisis, inflation has ultimately slowed down. However, it is possible to forecast the potential trajectory of inflation could be within the next months.

Indeed, three specific factors suggest that, globally, inflation is likely to return to target rates in the medium term. First, as central banks tighten monetary policy and pandemic-related fiscal stimulus is unwound, growth will slow; as the supply disruptions caused by the war in Ukraine are priced in, commodity prices will stabilise; and as global production lines and logistics adjust, supply bottlenecks will ease (Reifenschneider and Wilcox 2022, Ilzetzki 2022). Second, after decades of building credibility, inflation expectations are likely to

<sup>69</sup> Extract from Chair Powell's FOMC Press Conference (June 14, 2023)

remain well anchored over the medium term (Armantier et al. 2022, Bordo and Orphanides 2013). Finally, as long as the structural forces that depressed inflation before the pandemic persist, trend inflation will continue to be low (Ha et al. 2019).

Nonetheless, some of these factors may not actually unfold as anticipated, thus leading to sustained high inflation. For instance, stagflationary shocks could occur more frequently or could be more pronounced, causing repeated inflation overshoots that may eventually de-anchor inflation expectations in the future, or central banks may remain hesitant in their response and could fail to reach their targets so often that economic agents eventually lose faith in their commitment or ability to maintain price stability and inflation expectations become de-anchored. Furthermore, the structural forces that have depressed inflation over the past decade may fade (Gersbach 2021). Such an ambiguous future presents significant policy dilemmas for central banks, despite there's no need to deviate from the foundational principles that have fostered credibility over the last three decades. Indeed, central banks must keep adjusting their policies with a focus on macroeconomic stability, ensuring clear communication of their strategies while safeguarding their credibility.

As for the Eurozone in particular, inflation is expected to settle around the goal of price stability set at 2% over the course of the next months. This trend emerges from projections made by the ECB, whose baseline scenario predicts the CPI to slowly but steadily decline and stabilize at around 2% by the end of 2025<sup>70</sup>.

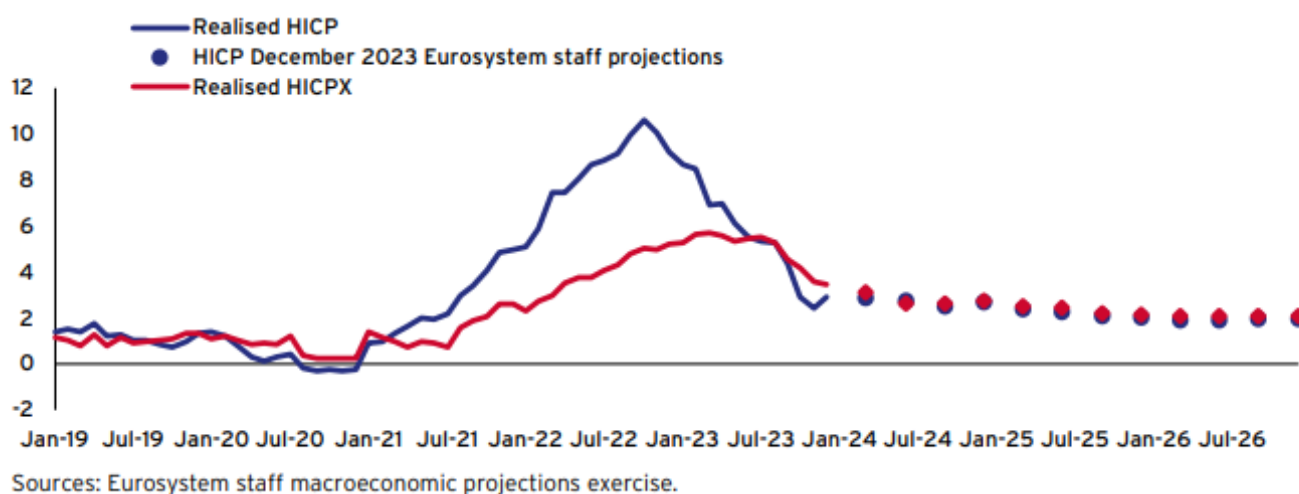


Figure 26 - ECB projections on future inflation in the short- and medium- term

<sup>70</sup> Currently, inflation in the Eurozone is hovering between 2.5% and 3%, a substantial decrease from its peak of over 9% in 2022.

Chapter 4 – A focus on Italy, considering how the energy shock has widened inequality among households (underlying its imported nature), evaluating the role played by monetary policy and suggesting fiscal policy measures that could be undertaken to obviate such an issue.

#### 4.1 How did the 2021-2022 imported energy shock broaden inequality among households within the Italian context?

Inflation is typically considered a regressive tax<sup>71</sup>, as it erodes more the purchasing power of vulnerable households<sup>72</sup> (Erosa and Ventura, 2002). The inflationary surge that has particularly hit Europe since 2021 has deeply worsened existing socioeconomic disparities – especially considering the Italian context, and such a phenomenon can be attributed mainly to the sharp rise in prices of food and energy. Dividing the Italian population into quintiles based on their income levels, we can notice from Figure 27 how the widening gap in inequality is primarily due to the fact that less-affluent households – mainly in the first and second quintiles – consume proportionally more on such goods, compared to the wealthiest ones – the fourth and fifth quintiles. Hence, households do not only differ in their financial capabilities, but also in the composition of their consumption baskets (as it emerges from the graph in *Figure 27*), with the consequence of lower-income households being much more exposed to increases in the prices of such primary goods.

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<sup>71</sup> Meaning it can disproportionately impact households with lower incomes.

<sup>72</sup> When prices rise due to inflation, people on fixed incomes or with lower wages may struggle to keep up with the increased cost of living. Since a larger portion of their income goes toward expenses like food, housing, and healthcare, any increase in prices has a greater influence on them.

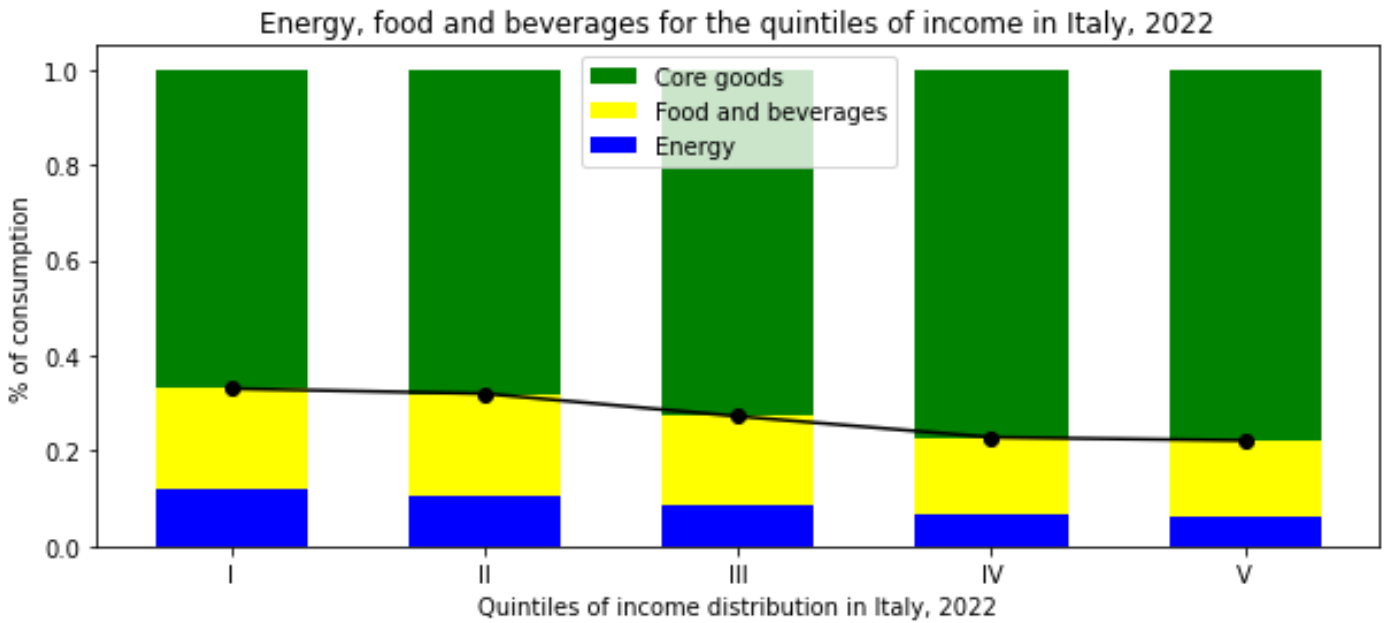


Figure 27 - Percentage of consumption for energy, food and beverages for the quintiles of income distribution in Italy, 2022. Source: ISTAT

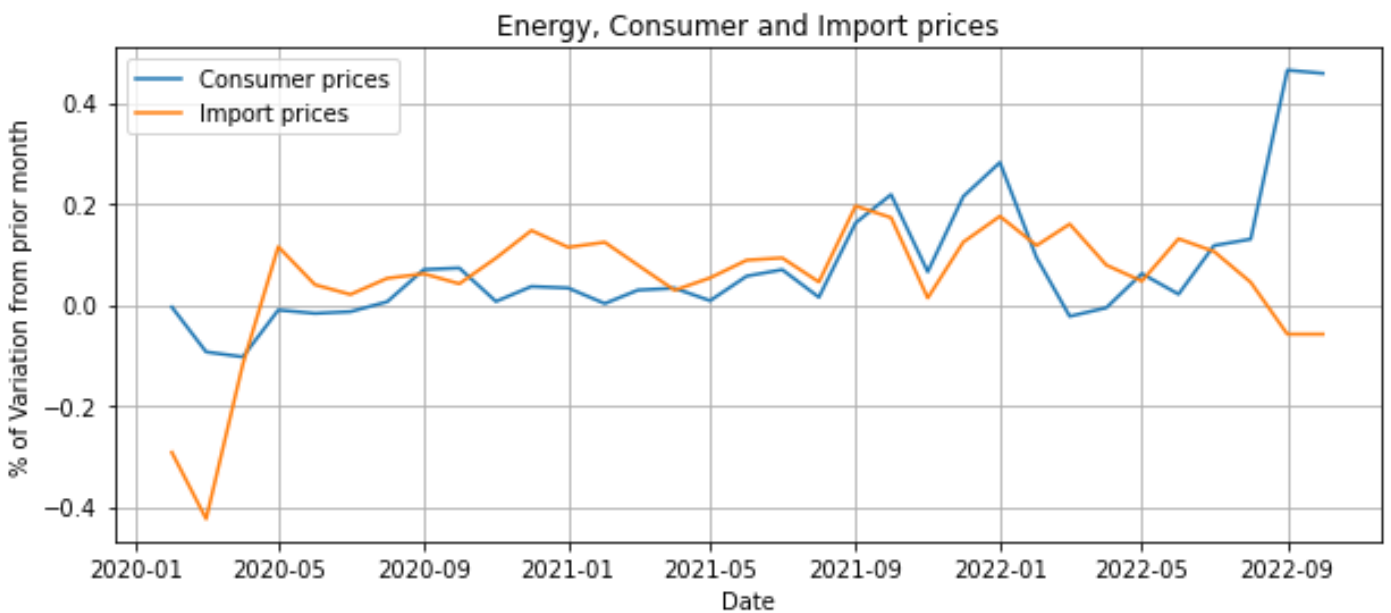


Figure 28 - Import and consumer prices in Italy for energy (2020-2022) - Variation from prior month. Source: ISTAT

The energy shock has played an important role in exacerbating inflation inequality, primarily because of its unequivocally imported nature stemming from turmoil in global energy and food markets, as we can observe from the graph in Figure 28. Hence, domestic conditions

were not playing the leading role in determining the inflationary wave (Corsello e Riggi, 2023). Indeed, energy import prices rose markedly in the second quarter of 2021 with a gradual transmission to consumer prices, especially starting in the last quarter of 2021 (Credit Suisse, 2021)<sup>73</sup>. In 2022, the escalation of tensions in the European gas market, triggered by the outbreak of the conflict in Ukraine, significantly exacerbated the upward trajectory of energy prices<sup>74</sup>. Moreover, considering that Russia and Ukraine are significant suppliers of essential food commodities such as wheat, maize, vegetable oils, and fertilizers, the conflict had profound adverse effects on the food industry as well. To examine the channels which the energy shock passes through and assert whether or not it actually increases inequality among households, four key variables can be examined: I) energy inflation, II) inflation gap<sup>75</sup>, III) core inflation and IV) industrial production. A negative energy shock manifests directly and positively through a rise in energy prices (energy inflation) which in turn exerts upward pressure, though moderately, on core inflation, and through an increase in the inflation gap, thus depressing the economic activity (industrial production). Such results highlight a significant widening of inflation inequality across households driven by the energy shock.

#### 4.2 Excursus on inequality among households in Italy and its correlation with imported-energy-driven inflationary shocks

Let's now delve into a brief overview of the socio-economic context in which such circumstances unfold: as it can be observed (Oxfam Italia, 2024), data reveal a growing disparity within the population of households over the past two decades. If we were to split the Italian population into deciles of equivalent income it becomes evident that, over the 23 years between the turn of the millennium and the end of 2022, there have been contrasting patterns in the distribution of income. Indeed, the portion of wealth held by the top 10% wealthiest decile experienced a growth of 3.8% over this period, while the allocation to the bottom 50% (first five deciles) of Italian households shows a declining trend, diminishing by a cumulative 4.5% over the same time span.

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<sup>73</sup> And an analogous pattern can be observed for food and beverages import and consumer prices.

<sup>74</sup> Russia has been the largest supplier of energy commodities to the euro area, not only for natural gas but also for oil and coal.

<sup>75</sup> The difference between the actual rate of inflation and a target rate of inflation set by policymakers.

Focusing in particular on the few past years we observe that, after a prolonged period characterized by low and stable inflation, the sudden increase in consumer prices during 2021-2022 took many countries, Italy included, by surprise. As previously mentioned, inflation amplifies inequality on socio-economic groups, as it affects disproportionately households with lower income, partly due to the distinct compositions of their consumption baskets. Estimates from the end of 2022 highlight significant disparities in the distribution of national net wealth, which have exacerbated since the second decade of the millennium. In particular it emerges that<sup>76</sup>:

- The wealthiest 20% of Italians (fifth quintile) hold over two-thirds of the national wealth (68.9%).
- The subsequent 20% (the fourth quintile) own 17.7% of the national wealth.
- The remaining 60% of the population (first three quintiles) possess merely 13.5% of the national wealth.

Furthermore, the distributional landscape between 2021 and 2022 shows almost a halving of the wealth held by the I quintile, (decreasing from 0.51% to 0.27%), a reduction in the wealth of the subsequent 2 quintiles (II and III), a slight increase in the share from the IV quintile, and substantial constancy in the share of the top 20% (V quintile)<sup>77</sup>.

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<sup>76</sup> Source: Credit Suisse-UBS

<sup>77</sup> Global Wealth Databook 2023, UBS-Credit Suisse

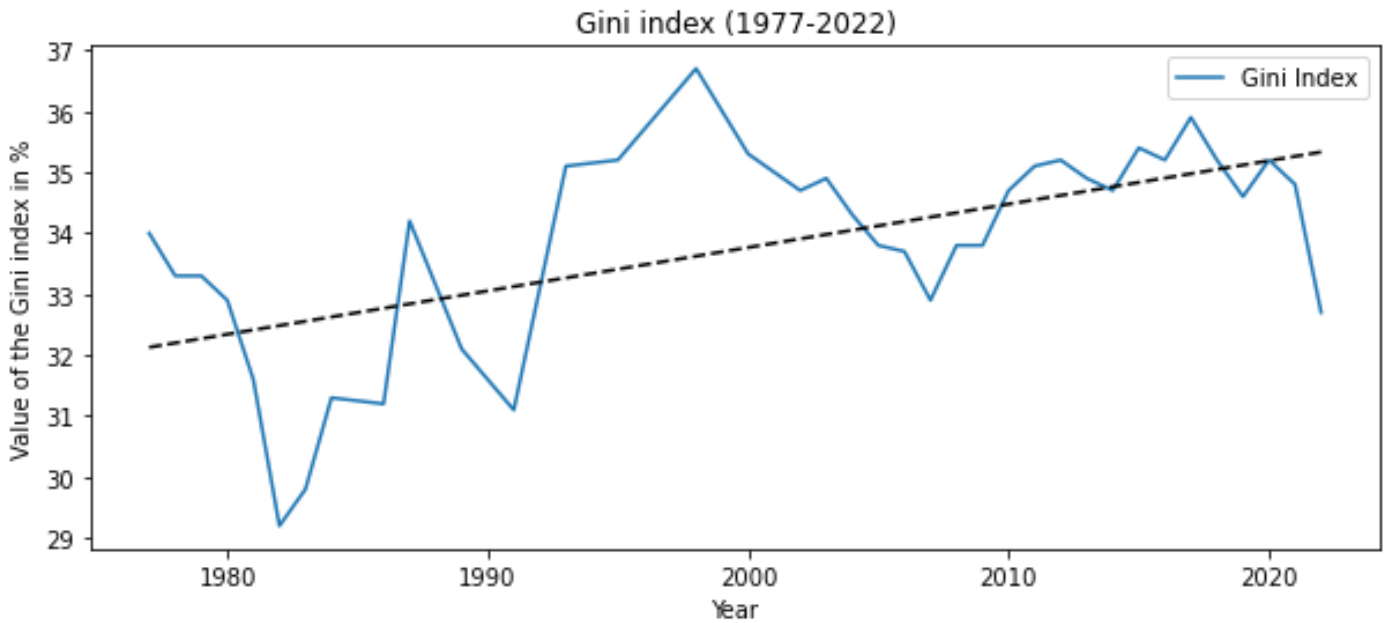


Figure 29 - Gini Coefficient for Italy (1977-2022). Source: World Bank

As it emerges from the graph in *Figure 29*<sup>78</sup>, over the past few decades the Gini coefficient<sup>79</sup> shows an upward trend (black dotted line), which suggests that inequality among Italian households has increased consistently, despite few setbacks.

However, the Gini index does not explain the reasons that may lie behind such a steady increase in inequality among Italian households and, for the purpose of this analysis, whether or not can be shown a correlation between energy-driven inflation and inequality. With regard to that, an approach to consider could be comparing the HICP for energy<sup>80</sup> among the different quintiles and observe their behaviour in the presence of strong global supply shocks.

If we examine this aspect with respect to the inflationary crisis of 2021-2022 (*Figure 30*), it clearly emerges that the impact on the income quintiles is heterogeneous, as the HICP-

<sup>78</sup> The Gini Index ranges from 0 (equal distribution among the population) to 1 (fewer individuals possess the majority of wealth or income). Naturally, the closer the index is to 1, the greater will be the inequality. In the graph represented in *Figure 29*, the Gini coefficient is expressed as a percentage.

<sup>79</sup> Calculated as a fraction where at the numerator we have  $\sum_{i=1}^{N-1} (P_i - Q_i)$  which computes the difference between the cumulative percentage of population until the percentile  $i$  ( $P_i$ ) and the cumulative percentage of the variable examined until the percentile  $i$  ( $Q_i$ ), for every percentile from 1 to  $N-1$  (this difference represents the distance between the actual distribution of the variable and a perfectly equal distribution). On the other hand, at the denominator we have  $\sum_{i=1}^{N-1} P_i$ , which computes the sum of cumulative percentages of the population under examination for the percentile  $i$ , for each percentile from 1 to  $N-1$  (this is used to normalise the coefficient).

<sup>80</sup> The HICP distinguished by quintiles of equivalent income allows us to observe how inflation affects the different groups of households differently.

energy for the I and II quintiles (*blue and yellow line, respectively*) experienced a far more remarkable growth since 2021Q3 compared to the other wealthier quintiles<sup>81</sup>; this illustrates a situation where low-income households are disproportionately affected by the rise in energy prices – as previously hypothesized – and suggests a correlation between energy-driven inflationary shocks and a greater inequality among households for the Italian context.

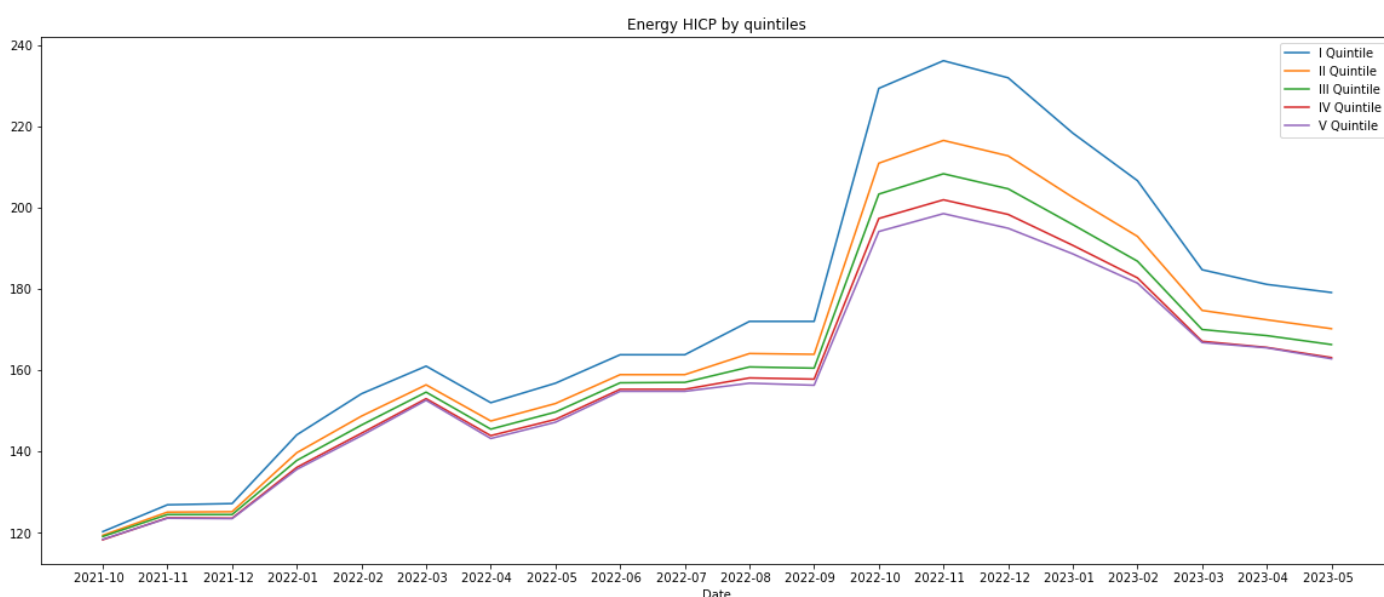


Figure 30 – Energy HICP by quintiles (2021-2023). Source: ISTAT

A similar pattern emerges if we decompose the HICP-energy by quintiles of equivalent income for the biennium 2008-2009, characterized by the outbreak of the Great Recession: in these circumstances, which are depicted in the graph in *Figure 31*, the I and II quintiles were still penalized as, after a major surge, the decline in their HICP for energy was sensitively more modest compared to, for instance, the IV and V quintiles. This outcome could provide more evidence on a positive correlation among energy-driven shocks<sup>82</sup> and the stretching of the economic divide between the top and bottom quintiles.

<sup>81</sup> It is also noticeable that the gap between the I and II quintiles and the wealthiest ones even widens when the shock starts to be reabsorbed, which points out that low-income households are still penalized, as the HICP-energy remains higher for them compared to the wealthiest groups of population.

<sup>82</sup> That crucially impact inflation



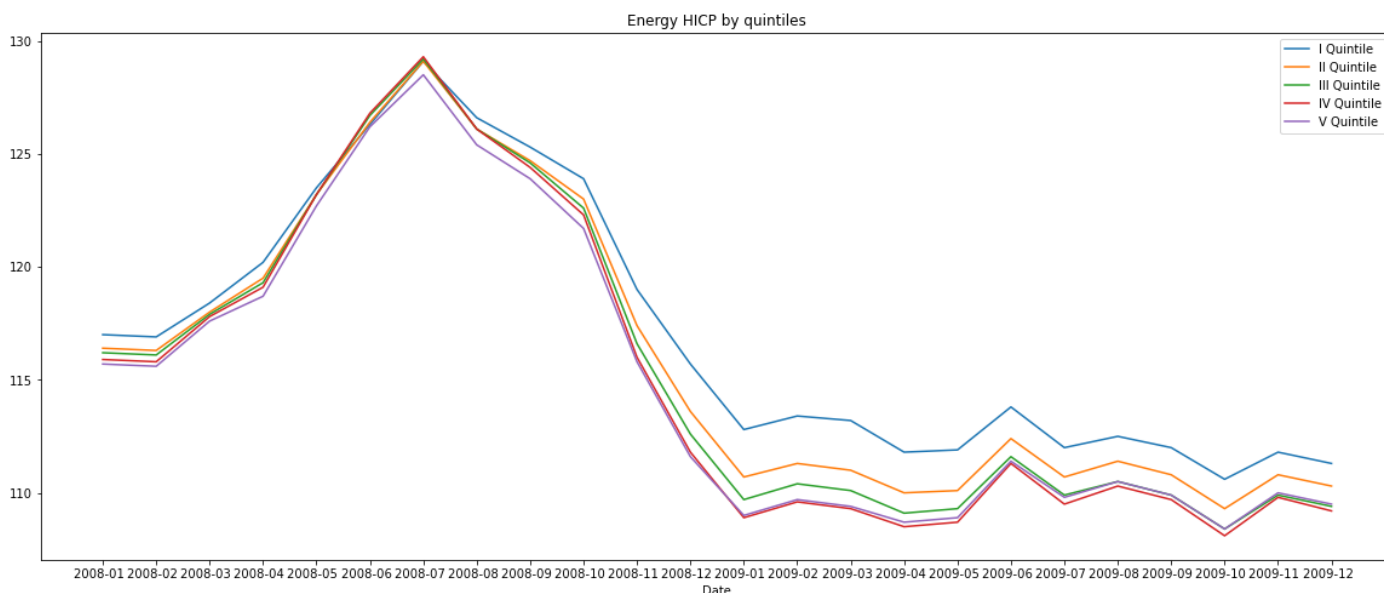


Figure 31 – Energy HICP by quintiles (2008-2009). Source: ISTAT

#### 4.3 The role of monetary policy: does it have a negative impact, intensifying such a phenomenon?

As discussed in the previous paragraphs, energy shocks appear to be important drivers behind inflation inequality. However, it is also worth mentioning that monetary policy can play a key role in exacerbating such a gap: increasing interest rates will affect inflation of core goods<sup>83</sup> more than energy (and food) inflation, as the determination of the latter tends to be more exogenous. As we have examined in 4.1, households do not only differ by their income, but also by the composition of their consumption basket; hence, given that the wealthiest groups of households consume a higher proportion of such commodities<sup>84</sup> compared to lower-income households, they benefit considerably more from the implementation of monetary policy tightening, and this phenomenon accentuates pre-existing disparities<sup>85</sup> in wealth distribution. In fact, if inflation slows down because of the monetary policy tightening and if the latter primarily affects inflation of core goods rather than food and energy inflation, then wealthier households may obtain more advantages, as their typical consumption items become cheaper in relative terms compared to the items more commonly consumed by lower-income households (food and energy), whose prices might remain high (or even increase) due to global circumstances. Thus, the

<sup>83</sup> Core goods include clothing, electronics, and services that are more sensitive to changes in monetary policy, as their prices are affected by domestic economic conditions, e.g. demand.

<sup>84</sup> Which are more easily affected by interest rate changes.

<sup>85</sup> As examined in 4.2

monetary policy measures could inadvertently increase wealth disparities by having a different impact on the inflation experienced by different income groups due to the varied nature of their consumption baskets (wealthier households might observe a reduction in the prices of the goods they consume more than lower-income ones).

This is amplified in the post pandemic period, as the energy shock was clearly determined by global factors and amplified by the war in Ukraine, especially in the euro area. Since households in the right tail of the expenditure distribution consume relatively more of the core goods, they also reap more benefits from a stronger monetary policy response in terms of preserving their purchasing power compared to more vulnerable consumers<sup>86</sup>.

Moreover, it is crucial to consider the indirect channels through which the restrictive monetary policy measures will have repercussions on inflation inequality: indeed, monetary policy, such as raising interest rates in this specific circumstance, will affect income distribution also via, for instance, the financial system and asset prices.

In fact, as central banks raise interest rates to reduce inflationary pressures<sup>87</sup> the cost of borrowing, which can disproportionately affect lower-income households<sup>88</sup>, increases as well; this surge leads to a higher cost of living for these households, exacerbating their financial situation and widening the economic gap among the wealthiest and lower-income households. It is also true that monetary policy also exerts a significant influence on asset prices, such as stocks. Wealthier households, who typically hold a larger share of their assets in financial investments, are adversely affected by restrictive monetary policy measures, as it decreases the value of their financial investments. Despite such effect, restrictive monetary policy still tends to overall increase wealth inequality.

All things considered, although a large part of the increase in inflation inequality can be attributed to the imported energy shock, on the other hand it is vital to stress that monetary policy also played a key role in exacerbating this phenomenon.

However, a monetary policy response aimed at containing the inflationary shock is also desirable, as it is undeniable that, if such measures were not implemented, inflation would be much higher for all consumers, regardless of their income<sup>89</sup>. Moreover, the more restrictive the monetary policy response to energy-driven inflation, the larger the widening

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<sup>86</sup> Source: Corsello F., Riggi M. (2023), Inflation is not equal for all: the heterogenous effects of energy shocks.

<sup>87</sup> As it has happened in the recent inflationary wave: both the ECB and the Federal Reserve have consistently raised the policy rates by, respectively, 4,5% and over 5%.

<sup>88</sup> This occurs as they tend to be more reliant on credit for consumption and especially for housing.

<sup>89</sup> Hence, all consumers benefit on a certain level from restrictive monetary policy, despite the wealthiest households obtain more advantages than lower-income households.

of inflation inequality, there appears to be a trade-off between the latter and how restrictive monetary policy measures can be<sup>90</sup>; therefore, the challenge lies in the need for balancing with redistributive measures<sup>91</sup>, thus complementing monetary tools with fiscal instruments to cope with the constraint of social equity.

#### 4.4 Need to implement fiscal policy measures: which ones?

In 2021 and 2022 the Italian government intervened to cushion households from rising energy prices, implementing a variety of fiscal policies that can be grouped into three main categories: I) Untargeted price reductions<sup>92</sup>, II) Targeted price reductions<sup>93</sup> and III) Measures

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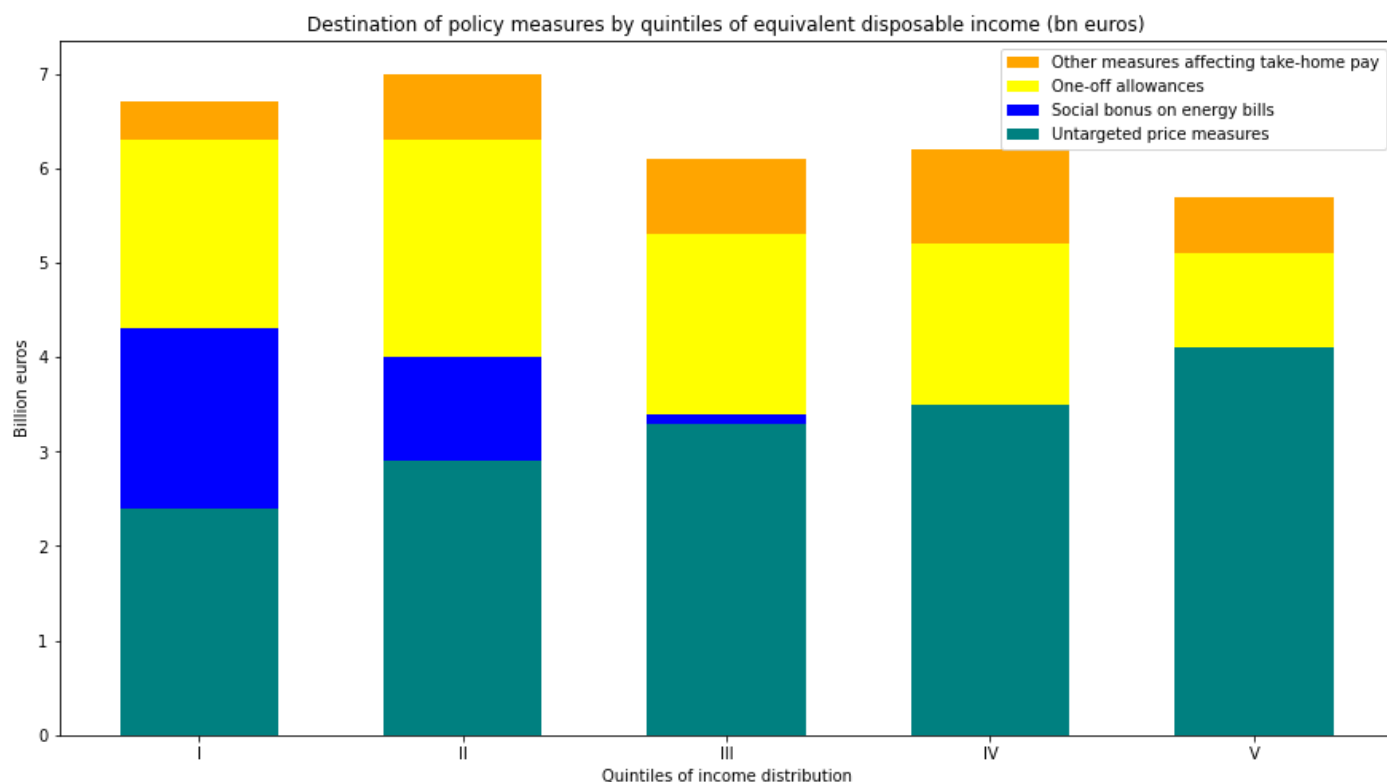
<sup>90</sup> By how many base points should the rates be raised by the central banks.

<sup>91</sup> Indeed, while monetary policy can effectively control the pace of inflation, solely relying on it may not address the underlying economic inequalities.

<sup>92</sup> Which include the cuts in general system charges and in the VAT rate on gas bills, and the reduction of the excise duties on fuel.

<sup>93</sup> Consisting in a strengthening of the 'social bonuses' on energy bills, which do not benefit the generality of consumers but only the most disadvantaged – realizing the redistributive effect of fiscal policy.

affecting income<sup>94</sup>. In particular, it can be observed from the bar chart in *Figure 32* how public resources were allocated among households' quintiles of equivalent income.



*Figure 32 – Destination of policy measures by quintiles of equivalent disposable income.*  
*Source: The Redistributive Effects of Inflation: A Microsimulation Analysis for Italy (2023)*

Figure 33 illustrates the different propensity to consume (in blue) across quintiles of equivalent disposable income<sup>95</sup>, with a decreasing trend from the first to the fifth quintile, as previously mentioned. The graph further indicates the impact of inflation on consumption (in yellow), emphasizing a significant increase of the latter as a percentage of disposable income for the lower quintiles<sup>96</sup>.

<sup>94</sup> Which comprehend all those interventions aimed at mitigating of the energy crisis by increasing the take-home pay of individuals, such as two one-off allowances (€200 and €150 bonuses).

<sup>95</sup> In terms of percentage points of disposable income.

<sup>96</sup> In particular, consumption nearly doubled for the first quintile due to rising prices.

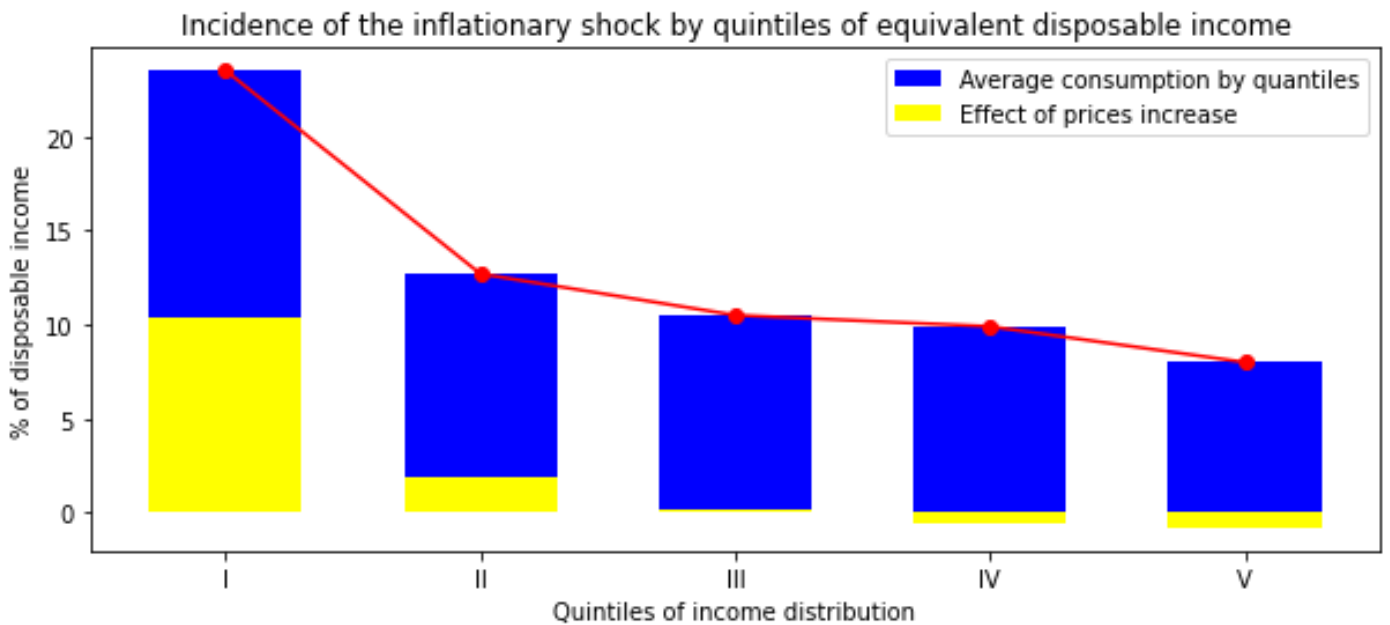


Figure 33 – Incidence of the inflationary shock by quintiles of equivalent disposable income. Source: *The Redistributive Effects of Inflation: A Microsimulation Analysis for Italy (2023)*

Figure 34 represents the incidence of the inflationary shock on disposable income gross and net of measures – therefore distinguishing between the levels of consumption by quintiles of equivalent disposable income before and after the implementation of the aforementioned government measures. Especially for the first two quintiles, government interventions were decisive: for instance, regarding the first quintile, the portion of disposable income attributable to consumption dropped from roughly 25% to about 10% (fiscal measures nearly halved the impact of the shock).

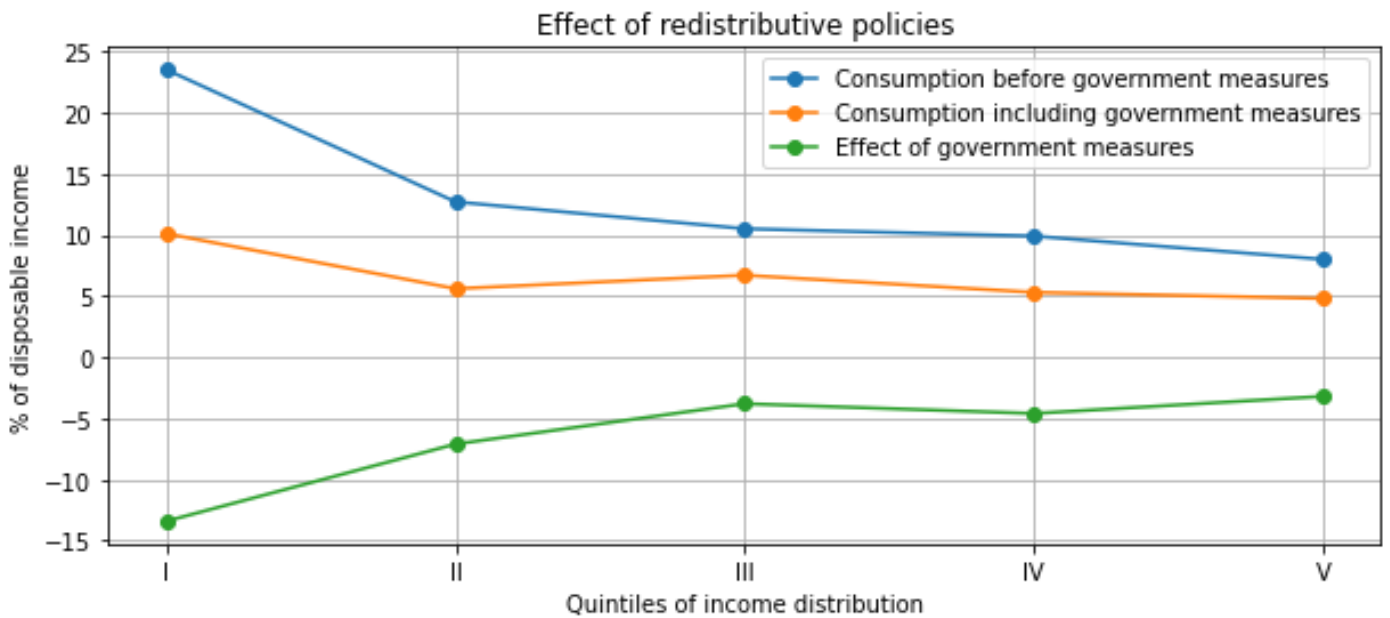


Figure 34 – Effect of redistributive policies on quintiles of income distribution. Source: *The Redistributive Effects of Inflation: A Microsimulation Analysis for Italy (2023)*

Figure 35 illustrates the impact of redistributive policies on equivalent income quintiles, measured by the reduction in the effects of price increases as a percentage of disposable income. The graph emphasizes how the strengthening of social bonuses is the type of policy whose effects primarily benefited the less-affluent Italian households (blue), while measures aimed at reducing energy prices for all consumers (teal) and those affecting take-home pay<sup>97</sup> (orange and yellow) benefited also mid- to high-income households.

<sup>97</sup> Which are allocated on the basis on individual income only.

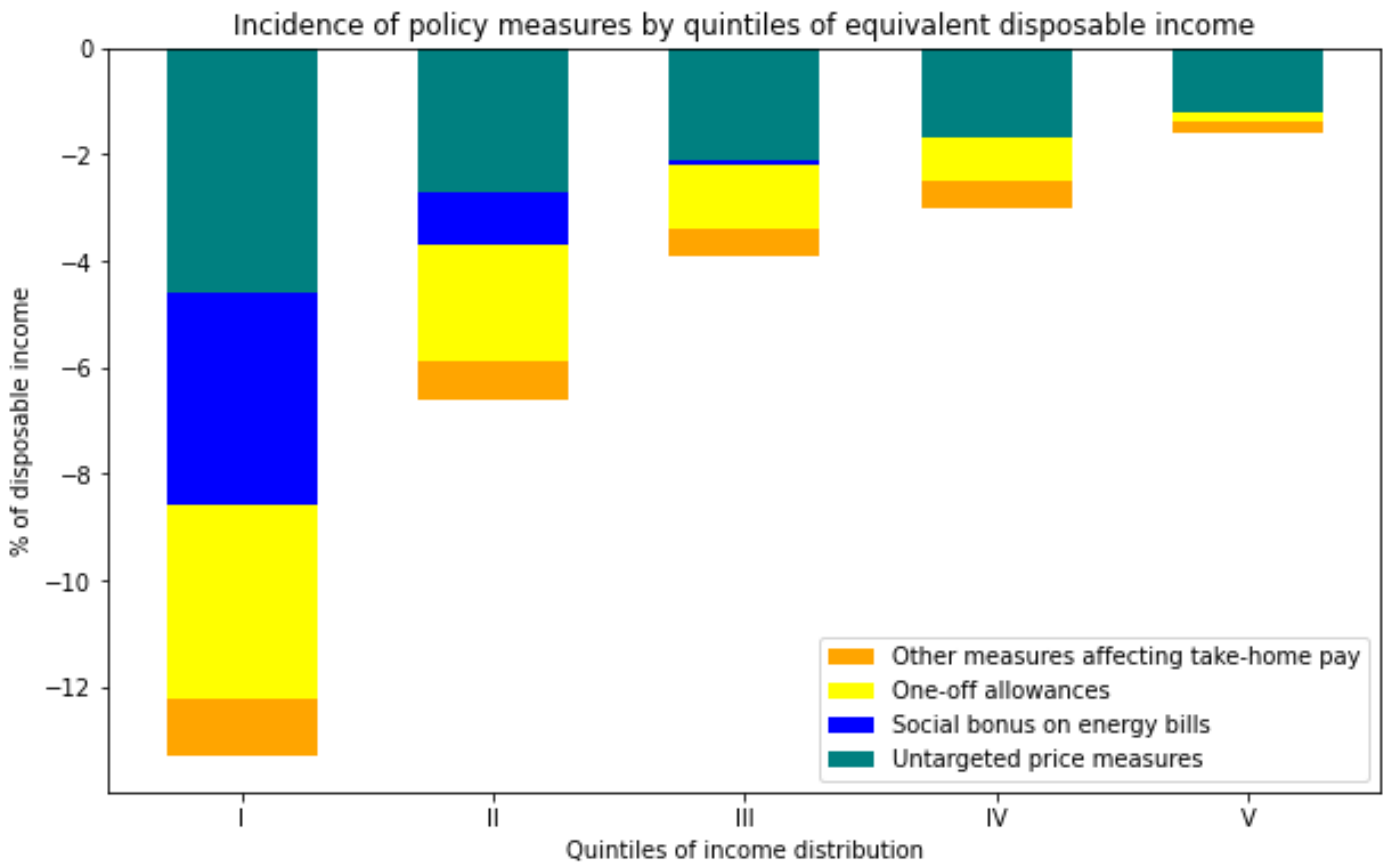


Figure 35 - Incidence of policy measures by quintiles of equivalent disposable income.  
 Source: *The Redistributive Effects of Inflation: A Microsimulation Analysis for Italy (2023)*

Overall, it is evident that government interventions were needed and had a crucial redistributive effect, offsetting a considerable portion of the disparity across income levels. Such a result was achieved, as indicated above, through policies aimed at either reducing the price level of certain goods or at augmenting the income of specific categories of households.

#### 4.5 How to prevent imported shocks from having such a large impact on households' inequality?

Global supply shocks, particularly those related to energy and characterized by their imported nature for specific countries, such as the one impacting Europe in 2021-2022, are not uncommon occurrences, and they often lead to significant disruptions. As a consequence, policymakers frequently advocate for the local production of essential inputs, in order to mitigate risks associated with overreliance on foreign suppliers.

Indeed, implementing production localization policies could theoretically represent a strategy aimed at mostly preventing and also mitigating the effects of imported inflationary shocks in the future – such as those observed in the 2021-2022 biennium. Localizing the production of certain goods, and specifically those that are more vulnerable to exogenous shocks, could significantly reduce the exposure to global price fluctuations, thus stabilizing domestic inflation. For instance, local production of energy, through the increase of renewable sources, such as solar and wind, and of food products can decrease dependence on imports and make the domestic economy more resilient to external shocks. Furthermore, localizing production could bring benefits in terms economic growth, strengthening regional economies, which could help reducing economic and social inequalities, improve income distribution, and increase social cohesion.

If, on one hand, this could appear an appealing strategy to put into place in order to be shielded against future imported energy shocks, it is also crucial to consider what would be the main consequences and macroeconomic effects and which the constraints of such measures of supply chain reorientation, particularly from the perspective of the EU. Generally speaking, localization policies tend to be inflationary, entail transition costs, and typically yield uncertain long-term effects on overall domestic output. However, the magnitude and direction of these impacts vary based on whether such policies are unilaterally implemented or provoke retaliatory measures from trading partners. Additionally, the extent to which they diminish domestic competition and productivity plays a crucial role in determining their impact.

Recent geopolitical events, such as the Russian invasion of Ukraine, along with the COVID-19 pandemic, have sparked concerns regarding the extent of EU countries' reliance on external suppliers. Indeed, severe negative shocks occurring in global supply chains can negatively interfere with GDP and inflation dynamics, as analysed in Chapter 3.

Hence, European policymakers have introduced certain legislation<sup>98</sup> aimed at spurring the local production of key manufacturing inputs and reduce “excessive dependencies” on external suppliers, in the perspective of the so-called Open Strategic Autonomy<sup>99</sup>.

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<sup>98</sup> For instance, the REPowerEU package, adopted in March 2022, which seeks to accelerate the ongoing clean energy transition by boosting renewables and energy efficiency (thus reducing the reliance on imported fossil fuels).

<sup>99</sup> European Union (EU)'s ability to safeguard its interests and pursue its desired economic, defence, and foreign policies autonomously, minimizing reliance on foreign states. How the European Commission has specified that Open Strategic Autonomy is not synonym for self-sufficiency for its own sake, but for the



However, what macroeconomic effects would emerge if such localization policies were implemented in a more massive and permanent way?<sup>100</sup> Given the global economy's high sensitivity to the seamless operation of supply chains, the international trade reconfiguration implied by localization policies could significantly impact key macroeconomic variables such as output, employment, and inflation.

In order to examine such effects, we can imagine a partial reshoring of production back to EU – consisting of a permanent replacement of a proportion of imported inputs used in the creation of export goods with locally produced inputs – and observe the behaviour of the EU vis-à-vis the rest of the world.

Assuming that EU unilaterally reshored only part of its production, on the long-run there would be cost savings on remaining imported inputs<sup>101</sup>, which would boost the competitiveness of EU exporters and allow them to export more<sup>102</sup>, increasing the domestic (EU) output. This phenomenon also arises due to the reduction of the market power held by export firms, which set a markup over marginal costs at each stage of the supply chain. However, with reshoring effectively shortening the supply chain, the cumulative markup along the chain falls significantly.

Although on the short-term this process implies a lower output<sup>103</sup> and an increase in inflation, which lead to an exchange rate appreciation, in the medium-term such phenomena would be offset, as lower import prices feed into lower export prices and the demand for EU exports rises. However, there are other reasons why reshoring might not be the path to take: for instance, the negative repercussions of markup and productivity shocks stemming from reshoring are expected to outweigh the advantages, leading to a sustained reduction in overall domestic output<sup>104</sup>. In summary, although such policies could hypothetically shield EU countries from adverse global supply shocks, they also present potential negative

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capacity to protect EU citizens from the impacts of unforeseen crises, such as another pandemic, a major disruption of supply chains, or an interstate conflict, coping alone against such negative shocks.

<sup>100</sup> Source: Daragh Clancy, Donal Smith, and Vil'ém Valenta, *The Macroeconomic Effects of Global Supply Chain Reorientation*.

<sup>101</sup> For instance, if the EU produced domestically some of the components used in its industries instead of importing them from foreign countries, it could benefit from lower prices or greater availability of such components in the domestic market.

<sup>102</sup> This cost reduction would make EU producers more competitive in the international market, as they could offer their products at more competitive prices. As a result, they might be able to export more goods than before, thus benefiting from foreign demand for EU exports.

<sup>103</sup> As such measures imply initial costs.

<sup>104</sup> In other words, the additional costs and productivity changes resulting from reshoring production domestically can ultimately have a negative impact on the overall economic output of the country.

aspects that could depress the economic activity and global trade, hence the costs would ultimately outweigh the benefits.

## Conclusions

This chapter has primarily focused on the profound impact of imported energy shocks on income inequality within the Italian context during the 2021-2022 inflationary wave. After a brief overview on the pre-existing situation (considerations on the extent by which wealth disparities have consistently increased over the past two decades), the focus was drawn on how lower-income households (or the first two quintiles of equivalent income) are disproportionately affected by rising energy prices, a phenomenon that exacerbated existing socio-economic issues; this was supported by data, which showed more evident increases in the HICP-energy for the lower-income quintiles compared to wealthier ones, suggesting a correlation between energy-driven inflation and widening inequality. It was also explored that restrictive monetary policy measures, while essential in order to reduce inflation, also played a pivotal role in intensifying such disparities, as they disproportionately benefited wealthier households (they spend proportionally more on core goods), thus further widening the economic gap. The Italian government's fiscal interventions in 2021 and 2022 were decisive in mitigating the adverse effects of energy price hikes on the most vulnerable households, as targeted measures (e.g. social bonuses) proved effective in reducing the impact of inflation on lower quintiles. As for future perspectives, and in particular for what concerns ways to shield against the impact of future imported energy shocks, the spotlight is moved to localization policies: while, on one hand, they could theoretically prevent future disruptions originating from global supply shocks (reducing reliance on foreign suppliers), on the other they may come with significant economic costs (including higher short-term inflation) and potential long-term reductions in domestic output.

All things considered, what emerges from this chapter's analysis is the correlation among the imported energy shock and increased wealth inequality, as well as the trade-off that policymakers face between the need to control inflation and to ensure social equity, stressing the importance of considering both factors in decision-making. Furthermore, this chapter emphasizes how the social challenges posed by imported energy shocks require a balanced approach that combines effective monetary policies (to reduce inflation) with fiscal measures (to support vulnerable households and cope with wealth inequality).

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