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# INFLATION AND ENERGY PRICE SHOCKS: LESSONS FROM THE 1970s

by Francesco Corsello\*<sup>o</sup>, Matteo Gomellini\*<sup>^</sup> and Dario Pellegrino\*<sup>^</sup>

## Abstract

The Yom Kippur war in 1973 and the Iranian revolution in 1979 triggered large oil-price increases that fuelled high and persistent inflation in advanced countries. There is a broad consensus that a weak monetary policy response, in the form of late tightening or early loosening, was one of the main causes for the failure to keep inflation under control after the 1973 shock. This failure is crucially tied to the end of the Bretton Woods era in 1971, when the fixed exchange rate regime and the currency peg to gold were abandoned, and monetary policy lost a consolidated frame of reference. A new framework – based on the commitment by independent and credible central banks to achieve clear quantitative inflation targets – would only be established in the subsequent two decades. Monetary policy conduct alone, however, does not fully explain the persistence and heterogeneity of inflation across advanced economies. Other institutional factors played a role – most importantly, the lack of central bank independence, the structural features of the labour market, and fiscal policy rules which turned out to be at odds with price stability. A structural VAR-based analysis confirms and quantifies the role these factors played in shaping inflation. Nowadays, the institutional context has evolved considerably, mitigating the risk of inflation staying high for as long as they did in the 1970s. Ensuring that the current institutional context continues to support price stability remains key in limiting inflation persistence.

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\* Bank of Italy, Directorate General of Economics, Statistics and Research.

<sup>o</sup> Economic Outlook and Monetary Policy Directorate.

<sup>^</sup> Structural Economic Analysis Directorate.



## 1. Introduction<sup>1</sup>

Russia's invasion of Ukraine in February 2022 triggered a rise in energy prices that has increased inflation in the euro area and many other advanced countries. While inflation was already on the rise in the post-Covid-19 recovery, fueled by the after-lockdown rebound in demand and by bottlenecks that emerged in supply chains, the Ukraine conflict exacerbated these dynamics due to the war-related tensions in energy prices, in particular in the gas market<sup>2</sup>.

Looking at past historical events, the Seventies are often taken as a benchmark to investigate the effects on inflation of abrupt energy supply shocks, and the related policy responses. That decade plays a crucial role in contemporary economic history, being a period in which the forceful economic growth the Western world experimented in the Bretton Woods era came to an end.<sup>3</sup> After the demise of the gold exchange standard regime set up at the end of WWII, the world economy was hit by large increases in the price of oil triggered by two episodes: the Yom Kippur war in 1973 and the Iranian revolution in 1979. Oil prices quadrupled in 1973–74, and more than doubled in 1979–80, fueling a sharp rise in inflation. Monetary policy performed quite poorly according to a widely shared view: its response was weaker-than-warranted after the first shock and this led to the need for a mighty response to the second shock that had significantly negative effects on economic growth.

There are several key factors that distinguish the present time from the 1970s, and these factors could prevent the energy shock from inducing the inflation persistence observed fifty years ago. In this paper, we focus on two of these aspects.

The first relates to monetary policy conduct: with the end of the fixed exchange rate regime and the abandonment of the peg to gold in 1971, monetary policy operated in the absence of a consolidated scheme, without a well-defined conduct framework. The latter would be established only progressively over the subsequent two decades and is based on a framework in which independent and credible monetary authorities fully agree on the importance of guiding inflation expectations and making the commitment to achieve defined inflation targets (Goodfriend, 2007).

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<sup>2</sup> See the Bank of Italy Annual Report on 2022, pp. 112-113: [https://www.bancaditalia.it/pubblicazioni/relazione-annuale/2022/rel\\_2022.pdf](https://www.bancaditalia.it/pubblicazioni/relazione-annuale/2022/rel_2022.pdf).

<sup>3</sup> As Eichengreen (2019), p. 129 puts it: “*The breakdown of Bretton Woods was a leap in the dark*”.

The second relates to three institutional factors that have played a crucial role in determining the persistence of inflation in the Seventies. Former Governor of the Bank of Italy, Carlo Azeglio Ciampi, in the early Eighties affirmed the need for a “monetary constitution”, in order to guarantee price stability<sup>4</sup>:

*[...] For the past ten years, after severing the indirect link to gold through the convertibility of the dollar and fixed exchange rates, the lira, like other currencies, has become an even more intangible and abstract asset, guaranteed in its value by nothing more than the strength of the economy and the ability of the society to organize and govern itself. [...]*  
*Inflation has been persisting for years [...] The restoration of monetary equilibrium does not come from the friction of scarce liquidity or an unaccommodating exchange rate. Returning to a stable currency requires a true change in the monetary constitution, involving the functions of the central bank, the procedures for public spending decisions and for income distribution. [...]*  
*The first condition is that the power to create money is exercised completely independently of the places where spending decisions are made. [...] the second condition is procedural rules that place the main spending decisions within the framework of monetary equilibrium. [...]*  
*Society must regulate the ways of choosing without dictating any content of choice. [...the third is to] define institutional forms through which collective bargaining returns to being an instrument for governing income dynamics and labor conditions, rather than ruining the currency.*

Lack of central bank autonomy in selecting goals and in using the available instruments; labour market bargaining processes characterised by high conflictuality and by wage-setting mechanisms disconnected from the dynamics of labor productivity, which fostered wage-price spirals via automatic wage indexation to prices (e.g. “scala mobile” in Italy); fiscal policy rules which resulted at odds with price stability. All these elements have proved to be decisive in fostering inflation.

In this paper, we analyse these topics and quantitatively assess the role they had in fueling inflation persistence in the Seventies. We start by describing in Section 2 the dynamics of inflation, GDP, and the monetary policy responses given in the Seventies to the oil shocks, comparing the experience of three selected countries (U.S., Germany, and Italy). In Section 3 we focus on monetary policy, placing it in the historical context and following the evolution of monetary thought along the subsequent 20 years. In Section 4 we perform a descriptive analysis of the role played in some advanced countries by those institutional factors that former Governor Ciampi addressed as crucial for monetary stability (Ciampi, 1981): central bank independence, fiscal policy, and labour market characteristics (see Visco, 2023). Section 5 provides a quantitative assessment: using a structural VAR model we perform, a counterfactual

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<sup>4</sup> Final remarks, in Banca d’Italia, Annual Report. Year 1980. Roma, 30 maggio 1981, p. 384 (our translation from italian).



analysis, focusing in particular on Italy, and identify the contribution of single factors (monetary policy, wage dynamics, fiscal policy) to the stubborn inflation of the Seventies.

## 2. Macroeconomic dynamics: some descriptive evidence

After the 1973 and the 1979 conflicts, oil prices first quadrupled, then more than doubled (Figure 1), fueling inflation in most advanced countries (Figure 2). A worrying feature that characterized this increase in prices, in addition to its speed and level, has been its persistence. Figure 3 reports the time-varying persistence of the inflation series computed as the parameter of a univariate time-varying autoregressive model with stochastic volatility: the black line is the distribution of persistence across 7 OECD countries while dotted vertical lines represent country-specific inflation persistence in the 1973-1977 (red line) and the 1978- 1982 (blue line) periods for the United States, Germany, and Italy. Both Italy and the U.S. exhibit a higher than average inflation persistence while in Germany (that, as we'll see in the next sections, behaved quite differently compared to the other countries considered) persistence is significantly lower both after the first and after the second shock. Moreover, as shown in Figure 4 (where a central measure of inflation persistence over time for the three countries is reported), in Germany after the 1973 shock the level of inflation declined and persistence too; then persistence increased, but only once inflation had reached a level of around 4 per cent per year.<sup>5</sup> In the U.S., inflation was brought back to pre-shock levels in late 1976 but already in 1977 started increasing again. Conversely, in Italy, inflation remained high between the two shocks. After the second shock, the degree of persistency slowly diminished and seems to be more homogeneous across countries.

Policy rates, our measure of the monetary policy reaction, were already on the rise well before the first oil shock (less in Italy), coherently with inflation: however, the immediate post-shock response looks fairly small (Figure 5). Subsequently, the interest rate reduction was rapid: in the U.S. the Federal funds rate rose after 1973 but then reached pre-shock levels already in late 1974 (supposedly because of concerns related to economic growth), just one year after the outbreak of the Yom Kippur war.<sup>6</sup> In Italy, the initial rise in the policy rate was reabsorbed after

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<sup>5</sup> A key reason for Germany's success during the 1970s was an institutional change: following the collapse of Bretton Woods international monetary system, Germany adopted a nominal anchor in the form of monetary targeting and this contributed to raise the credibility of its fight against inflation. See ECB (2010); Beyer et al. (2009).

<sup>6</sup> In the same vein for an earlier period, Bordo and Humpage (2014), p. 19: "*The Federal Reserve's anti-inflation policy...from 1965 through 1969 did not limit the rise in inflation because the FOMC did not stick to it for long enough*".

5 quarters. Inflation in Germany seems to have not been particularly affected by the oil-shock and monetary conditions were eased in late 1974, as inflation declined.

In the US and Germany, a neutral stance of monetary policy was reached well before the second oil shock and a restrictive monetary policy stance prevailed thereafter. Italy followed with some delay (Figure 6). This helped to curb inflation, although with a different timing.<sup>7</sup>

The U.S. and Germany experienced a severe drop in aggregate demand and fell into a double-dip recession between 1981 and 1983 (Figure 7). In Italy, real GDP fell after the first shock when monetary policy did not respond aggressively, while growth only slowed down after the second shock when the policy response was tighter. These differentiated pictures do not help to shed light on the extent to which recessions were eased by the monetary policy reaction.<sup>8</sup> In the last section of the present work we'll measure quantitatively this effect with a Structural vector autoregressive (SVAR) analysis.

To summarize the three stories analyzed so far, they differ from each other in some aspects. After the first shock in the U.S., notwithstanding an initial weakness of the monetary policy response, inflation gradually converged to pre-shock levels but a possible premature easing seems to have favoured persistence. The Volcker era followed and attacked inflation as the main enemy. In Germany, inflation did not increase after the first oil shock. Conversely, the second shock was associated with an increase in inflation, dealt with a sharp increase in the policy rates. Italy's inflation, already on the rise before the first oil shock, jumped after 1973. The country was not able to curb inflation during the Seventies with a scant monetary policy reaction (limited by scarce operational autonomy<sup>9</sup>) and struggled to bring inflation down in the Eighties.

Overall, a relatively accommodative stance of monetary policy after the first oil shock, and a subsequent and robust tightening after the second one which was effective in combating inflation, prevailed. At the same time, severe negative consequences on growth were recorded

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<sup>7</sup> In Italy in particular, the decrease of inflation was slower. See Gressani, Guiso and Visco (1987); Visco (2022).

<sup>8</sup> Using a “classic pre-Phillips curve” approach, ECB (2010), p. 110, attributes to the inflation process itself at least part of the responsibility of the poor macroeconomic performance: “*The experience of the Great Inflation, when higher inflation was systematically associated with a dismal macroeconomic performance [...] decisively contributed to the reaffirmation of the “classic” pre-Phillips position that inflation, by distorting price signals, impairs the functioning of market economies and therefore ultimately exerts a negative impact on overall macroeconomic performance*”.

<sup>9</sup> In 1981 a decisive turning point in central bank independence occurred in Italy with the so-called “divorce” between the Central Bank and the Treasury (a concise but effective account of the event is traced by former Bank of Italy Governor Mario Draghi: [https://www.bancaditalia.it/pubblicazioni/interventi-governatore/integov2011/AREL\\_150211.pdf](https://www.bancaditalia.it/pubblicazioni/interventi-governatore/integov2011/AREL_150211.pdf)). Still, the institutional and structural factors we'll focus on later in this paper, all favoured inflation persistence throughout the Eighties (Visco, 2022).

after both the two energy shocks. A better inflation performance was recorded in Germany, particularly after the first shock, when inflation reached about 7% and quickly declined, while in Italy inflation reached peaks around 20% in the Seventies and Eighties and stood persistently at high levels. U.S. inflation exhibited a high persistence too in the Seventies peaking at about 13.5% in 1980.

Clarida, Gali, and Gertler (2000) and Sims and Zha (2006) claim that there has been a significant change in how monetary policy was conducted before and after 1979, and that this regime shift proved finally to be effective in reducing inflation in the Eighties.<sup>10</sup> The reasons why monetary policy initially failed and the path through which an anti-inflationary consolidated scheme of conduct was reached, are analysed in the next section.

### **3. Monetary policy before and after Bretton Woods**

Some analogies between the 2022 energy shock and the oil shocks in the 1970s may raise concerns about today's inflation persistence in the medium-long run. Now as then, advanced economies have been hit by an unexpected exogenous surge in energy prices, driven by geopolitical tensions. Now as then, the negative supply shock drove inflation to two digits figures in almost all advanced economies.

Still, there are fundamental differences from yesterday that can be at the heart of a possible (although by no means certain) less persistent impact of the energy crisis today if compared to the Seventies (see Ha, Kose and Ohnsorge, 2022)<sup>11</sup>. A non-exhaustive list of these differences includes: monetary policy (both in terms of reaction function and credibility); fiscal policy rules; labour market characteristics (in terms of conflictuality in the bargaining process and wage indexation mechanisms); the exchange rate regime; the energy intensity of production.<sup>12</sup>

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<sup>10</sup> Clarida, Gali and Gertler (1998) study monetary policy rules since 1979 in US, Germany and Japan but also in UK, France and Italy. They find that inflation targeting emerges as the main rule in these countries. Central banks started responding to expected inflation using nominal rates, so to control eventually real rates.

<sup>11</sup> Long-term trends in technological innovation, the digital revolution, globalization and ageing, also contributed to lowering the level of inflation in the last decades and are likely to do so in the future. On the inflation-reducing impact of demographic trends, see Barbiellini Amidei, Gomellini, and Piselli (2019). Differently, Goodhart and Pradhan (2020) claim that ageing will contribute to raising future inflation.

<sup>12</sup> If the first three topics will be analysed in the next paragraphs, the last two will not. However, a few words must be spent before leaving them aside. In the early Seventies, the fixed exchange rate regime with limited capital mobility set out at Bretton Woods nearly thirty years before collapsed, opening a season of exceptional turbulence in international monetary relations with flexible and volatile exchange rates. Appreciations or depreciations of exchange rates affected domestic prices and possibly influenced the effects of the first oil shock. In 1979, at the eve of the second oil shock, the European Economic Community member countries created the European Monetary System, built on the concept of stable but adjustable exchange rates. The latter worked as a nominal anchor for monetary policies, with the aim of bringing monetary discipline in order to curb inflation (although with possible losses of competitiveness and a deterioration in the trade balance). The realization of the Economic and Monetary Union, which culminated in the irrevocable fixing of conversion rates among some European countries and the

In order to look for the roots of the mentioned monetary policy weakness, it is necessary to frame it in the historical and economic landscape of the time. Aside from the two energy shocks, the 1970s and the early 1980s marked the most important transition in modern history in terms of theoretical paradigms and practical conduct behind monetary, marking the end of the so-called Bretton Woods gold-exchange standard (Eichengreen 2019) and the progressive establishment of a “fiat money” international monetary system. This entailed the transition from a system where monetary order was guaranteed by anchoring the currency directly to gold, either directly or indirectly, throughout the international prevailing foreign currency, in the so-called gold exchange standard.<sup>13</sup> After a transition phase that lasted for around two decades, a new paradigm emerged, where fiat money order stability was guaranteed by the commitment to inflation targets by independent monetary authorities (Leiderman and Svensson, 1995).

Fiat money periods had already appeared in Western economies in modern history, typically when monetary policy was subdued by the need to finance war expenses<sup>14</sup>. Still, the need to restore gold convertibility as soon as possible, either directly or indirectly through a gold exchange standard, was undisputed among both policymakers and public opinion. The eventual matter of debate was the timing and the level of the new gold convertibility.<sup>15</sup>

During the Bretton Woods system (1944-1971) a so-called Keynesian economic consensus was in place (permanent inflation-employment trade-off described by the Philips curve), favouring relatively more accommodative fiscal and monetary policies. Still, the presence of a monetary anchor in terms of exchange rate pegging forced domestic policies into “stop-and-go” phases (Bordo, Bush and Thomas 2022 for the UK). The pressure to pursue such domestic policies, coupled with the progressive loosening of capital controls (associated with policies aiming at favoring international trade), put increasing strain on such a system (Eichengreen, 2019). In the end, the U.S. decision in 1971 to abandon the convertibility of the dollar to gold

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introduction of the euro in 1999, changed the rules of the game further possibly affecting the responsiveness of euro area inflation to external energy price shocks. As far as productive specialization is concerned, advanced economies evolved towards a productive specialization that is less energy intensive. Furthermore, the larger opportunities for firms and households to access different suppliers, use of alternative sources, and to adopt efficiency improvements, might limit the impact of the gas price shock. On the other side, the concentration of European gas supplies in gas pipelines from Russia (that is nowadays still sizeable albeit reduced with respect to 2021 when it was around 40% in EU) strengthens the risks of persistence of high gas prices as well as the risks of not being able to access to part of the gas supplies for an extended period of time.

<sup>13</sup> The gold exchange standard mechanism, which linked currencies indirectly to gold through a pegged exchange with the main foreign currency, was conceived to enhance money supply elasticity, a relevant shortcoming of the gold standard system. The first, short-lived attempt during the 1920s (the sterling standard), quickly collapsed during the Great Depression. The so-called Bretton Woods agreement (dollar exchange standard), was put in place for almost 30 years, from 1944 to 1971.

<sup>14</sup> For instance, in post-unitary Italian history, it was the case of war to complete national unity at the end of the XIX century, and World War I (Toniolo, 2022).

<sup>15</sup> See the political debate during the post-WWI international economic conferences (Toniolo, 2022).

marked the end of this era. The temporary currency pegging agreement put in place among the largest advanced economies, the so-called “Smithsonian agreements”, rapidly collapsed by February 1973. Looking at the inflation trends in the 1970s, it is striking to notice that inflation was already growing before 1973, and its acceleration in 1973 is associated with the end of the Smithsonian agreement (February 1973), rather than with the first oil shock (October of the same year).

The following period can be effectively described as a “leap in the dark” for monetary policies, which is the most important transition in monetary policy instruments in the modern age. The ultimate result was the widespread establishment of “inflation targeting practices”, which gradually replaced commitment to gold and/or foreign currencies. Still, this path unraveled along around two decades of transition, with significant heterogeneity across countries in the timing of this path. Bordo, Bush and Thomas (2022), assessing the UK case, depict this process as an initial “muddling through”, a process made of trials and incremental steps under a new and unclear scenario, developing into a “tunneling through” with a progressive convergence towards a new theoretical and policy conduct framework in monetary policy.

At the beginning of this new era exchange rate management, the historical benchmark to pursue monetary discipline, was still the most widespread tool to pursue some monetary order, but its importance progressively diminished over the years. Indeed, anti-inflation policies were often pursued through managed exchange rate policies. For instance, in the Italian case, in the early 1980s, the Bank of Italy pursued a real exchange rate appreciation policy, by mitigating nominal depreciation to be smaller than relative price changes (Gressani, Guiso, Visco 1987).

After the demise of the Bretton Woods agreements, larger countries like U.S. and Japan choose floating exchange regimes. European countries, and other smaller economies which were more affected by floating exchange rates, usually preferred adjustable pegging mechanisms. The European Monetary System (the so-called “snake”), a currency band mechanism coordinated between European countries, persisted until the 1992 crisis.

At the same time, monetary targeting policies experimentations, as prescribed by the benchmark monetarist approach, proved effective in taming inflation in Germany and Switzerland and early experimentations after the Yom Kippur oil shock. Still, monetary targeting resulted unsatisfactory in other cases (see Bordo et al. 2022 for the UK) and grew progressively outmoded. It became acknowledged how its effectiveness in pursuing price stability relied on assuming a stable money demand function (Neumann, 1997; Signorini, 2022).

Thus, central banks progressively nurtured a critical paradigm shift in monetary policy. Indeed, as highlighted by prominent literature, after the merciless unfolding of inflation since 1973, central banks started to build forward-looking policy rules and target expected inflation. The foundations of monetary policy strategy were crucially enriched by the rational expectations revolution, according to which agents are rational, respond to policy changes, and cannot be manipulated (Sargent and Wallace, 1975; Barro, 1976).<sup>16</sup> The ability of policymakers to credibly commit to a low inflation policy became key: a credible commitment by monetary authorities to contain inflation is regarded nowadays as essential to driving inflation expectations on a path consistent with central bank's inflation target (Clarida, Gali and Gertler, 1998).<sup>17</sup>

Central banks are today able to autonomously select specific goals and pursue their objective with determination. Central banks became thus more credible, a feature of utmost importance in anchoring inflation expectations. If not promptly and rapidly addressed, persistency in inflation may lead to a de-anchoring of inflation expectations.<sup>18</sup> The experience of the Seventies and of the Great Inflation shows that if this happens, the monetary policy response required to bring inflation down has to be more severe, possibly contributing to a stagflationary outcome.<sup>19</sup>

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<sup>16</sup> The rational expectations revolution informed crucially the debate regarding *rules vs. discretion* as well as that on *time inconsistency* (Kydland and Prescott, 1977; Barro and Gordon, 1983). See also, Signorini (2022).

<sup>17</sup> For a historical appraisal of central bank credibility: Bordo and Siklos (2015). Gaiotti and Secchi (2012) describe the progressive shift in monetary policy framework for Italy starting from the late Seventies.

<sup>18</sup> According to Reis (2021), inflation expectations in the U.S. at the end of the Sixties were already de-anchored: “*During the U.S. Great Inflation, data on expectations show a drifting anchor already between 1967 and 1970, well before the end of Bretton Woods or the oil price shocks*” (p. 41). For Italy, one of the first analysis based on expectation data is in Visco (1976) where a business opinion survey on inflation conducted twice a year since 1952 by the Italian economic magazine «Mondo economico» is analyzed. The focus is mainly to investigate the “rationality” hypothesis. The author presents, among other econometric evidence, some interesting graphs that show how expectations and actual inflation went hand in hand until the early Seventies, then they decoupled with the latter always “surprising” the former, concluding that: “*Over the years of moderate though variable inflation rates between 1952 and 1972, the rational expectations hypothesis is not rejected by the survey data [...]; in the last decade, however, shocks that have hit the Italian economy have always «surprised» businessmen surveyed*”.

<sup>19</sup> In trying to answer the question whether and why monetary authorities did relatively little to fight inflation after the 1973 shock, the conventional wisdom, at least for the U.S. case, is that policymakers deliberately preferred to sacrifice price stability in order to pursue better outcomes in terms of employment and economic activity. Nelson (2022) adds that monetary inaction was mainly due to a nonmonetary view of inflation according to which a contractionary monetary policy would have been ineffective in easing off inflationary pressure in case of cost-push shocks: income policies would have been more effective compared to a monetary contraction. In the same vein, Romer and Romer (2013) claimed that the “most dangerous idea” in Federal Reserve history was underestimating its capacity to stabilize inflation. Whereas in the Thirties the impact of the Great Depression was exacerbated by the belief that monetary policy could not mitigate the output decline, in the Seventies pessimism in the ability of contractionary monetary policy to rein in the oil-shock inflation magnified its level and persistence leading to the Great Inflation. The subsequent Volcker cure showed that this pessimism was wrong. According to Enders, Giesen and Quin (2022) the experience of the ‘70s and ‘80s would suggest that “*monetary policy should not leave any room for doubt*”: it must react after a shock to avoid high inflation becoming persistent and entrenched in expectations.

## 4. The role of institutional factors

### *4.1 Institutional drivers of inflation persistence*

The cross-country heterogeneity in inflation performance detected in the previous paragraph may be generalized by looking at a larger OECD sample. In Figure 8 we show the correlation between average policy rates in the first two years after each of the two oil shocks (horizontal axis) and two inflation outcomes, namely the average inflation (left panel) and the percentage reduction in inflation (right panel) both recorded in the six years after the two shocks. On average, we observe that a better inflation performance (that is lower average inflation or higher inflation reduction) is not systematically associated with the response of monetary policy in terms of interest rates. On the contrary, especially after the first shock, those countries that initially kept nominal interest rates at higher levels (in line with different levels of inflation), recorded on average higher levels of inflation after the shock and a smaller reduction subsequently. After the second shock, in the context of increasingly restrictive monetary policies, we record a mild association between policy rates and inflation reduction.

This is a mere cross-country correlation and does not say much about the effectiveness of monetary policy. Nonetheless, it suggests that the monetary conduct, proxied by the use of policy rates, at least does not totally explain cross-country differentials in inflation, calling for further analysis of potential institutional and structural factors that contributed to high inflation.

As we mentioned in section 1, former Governor of the Bank of Italy, Carlo Azeglio Ciampi, argued that tackling high and persistent inflation in Italy needed the establishment of a monetary constitution, encompassing: i) central bank independence; ii) rules for sustainable fiscal policy; iii) labor market institutions. Along a similar line Salvati (1985) claimed that, given the labour markets and fiscal stance conditions, Italian monetary policy could have been nothing but helpless in taming the resulting high levels of inflation, at least without accepting heavy recessionary effects. In this section, we discuss these three potential factors based on existing theoretical and empirical literature, and present some stylized facts on their correlation with inflation. The evidence we show, as said, are simple correlations: they cannot be interpreted as causal and are not conclusive.

We have explained in the previous section how central bank independence was central to a new monetary conduct framework. In the three panels of Figure 9 we plot the association between an index of central bank independence (drawn from Alesina, 1988<sup>20</sup>) and average

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<sup>20</sup> The index is based on some criteria related to price stability as primary CB objective and to the dependence of the CB from government.

inflation before (upper left panel), after the first (upper right), and after the second oil shock (lower left). Central bank independence is strongly correlated with average inflation in the shock decade: the countries with more independent central banks recorded lower inflation rates. It is very telling to observe that a negative association between independence and inflation emerges only from 1973, after the demise of the Bretton Woods monetary arrangements and the supply oil shocks, while these variables are uncorrelated beforehand.

As fiscal policy is concerned, expansionary fiscal policies have been called one of the main drivers of inflation in the 1960s and 1970s. In Italy, for example, over the 1970s public expenditures grew by around 11 percentage points in terms of GDP: this was not matched by comparable growth in taxation capacity (Salvati, 1985) and was accompanied by the regulatory obligation of purchasing (unsold) public debt by the central bank (at least before the so-called “divorce” of the Bank of Italy and the Treasury in 1982). Bianchi and Melosi (2022), making an explicit reference to the 1970s, argued how monetary tightening, in the presence of structural fiscal imbalances, is ineffective to curb medium and long-term inflation.

Looking at cross-country evidence, Figure 10 shows the pre- and post-shock correlation between the deficit to GDP ratio and inflation. We find an overall positive association between the two variables after the oil shocks (in a 5-years period). Still, the correlation appears blurred, with outliers such as Belgium, where very high deficits are not associated with above average inflation; or countries like Spain and Finland, suffering very high inflation with below than average deficits.<sup>21</sup>

Finally, we analyze institutional features of the labour market which can fuel second-round effects that may have been associated with cross-countries differences in post-1973 inflation. We consider three aspects, which are deeply intertwined: wage indexation, the degree of labor conflicts, and the degree of wage-setting centralization.

First, the most straightforward and formal mechanism yielding nominal wage responsiveness to inflation is automatic wage indexation to price increases. In the Italian case, for example, the so-called “sliding-wage scale”, which implied a full adjustment of wages to price dynamics with a quarterly frequency, was regarded as one of the main culprits of inflation persistence in the 1970s and 1980s.<sup>22</sup>

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<sup>21</sup> The lack of clear evidence could be due to several factors such as the heterogeneity of monetary policies across different countries which may contribute to obfuscate the partial correlation between fiscal policies and inflation.

<sup>22</sup> The indexation mechanism, from 1975 onward, provided for the same absolute nominal wage increase (“punto di contingenza”) to a percentage increase in the price index, resulting in heterogeneous wage indexation across wage levels. Shrinking wage inequality was an underlying objective of this measure, jointly with purchasing power



Additionally, a high level of labor conflict, or “low cooperation” in the labour market, has been regarded as a driver of inflationary pressures (Black, 1982; McCallum, 1983). The rationale is that the high level of labor conflicts is expected to yield higher real wage rigidity to costs shocks.<sup>23</sup> Lorenzoni and Werning (2023) recently rewamped the case for conflict as the proximate cause of inflation. In Figure 11, we provide descriptive evidence on the cross-country association between labor conflicts, indexation and inflation. We plot the correlation between strike intensities on the y-axis (a proxy of conflictuality, as suggested by McCallum, 1983) and inflation on the x-axis, before and after the two shocks. The strike index is computed between the 1950s and the 1960s, so it is predetermined with respect to the economic distress associated with the Great Inflation (which might have heightened labor conflicts). Furthermore, we classify countries by the level of wage indexation (associated to different colours). The scatter diagrams show that conflict and wage indexation are positively associated and are, in turn, both correlated to higher inflation after 1973.

Last, although we do not present evidence in this note, also the wage-setting degree of centralization at the national (or regional) level, coupled with higher labor market cooperation, was regarded as another key labor market institutional aspect that played a structural role in the cross-countries differential inflation patterns of the 1970s and the 1980s. Bruno and Sachs (1985) and Tarantelli (1992) claim that labour markets in which wage setting was centralized and coordinated (that Tarantelli called neo-corporatist labour markets), widespread mostly in Northern and continental Europe, fared better than decentralized labor market systems (as those in the U.S., UK, and Italy<sup>24</sup>), conducing to a more favorable inflation employment trade-off. The rationale would lie in what follows: centralized mechanisms, contrary to dispersed wage claims, determine a more efficient wage setting, allowing the internalization of the aggregate inflationary costs for workers. According to Tarantelli (1992), a centralized wage-setting mechanism might curb inflation expectations through an “announcement effect” in a similar fashion to monetary policy, although with smaller consequences in terms of output contractions. Such a scheme would require unions to be strong enough and willing to cooperate with both the government and the employers representatives, conceding on post-shock wage moderation

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protection. Cfr. Filosa and Visco (1977) for an analytical discussion. Furthermore, Visco (2013), in a speech dedicated to the Italian economist Luigi Spaventa, offers a review of the debate on wage indexation and inflation from the Seventies to the early Nineties

<sup>23</sup> A microeconomic explanation of the labor market cooperation-inflation nexus relates to asymmetric information between workers and employers on labor marginal productivity: a lower level of trust and cooperation implies that workers are less willing to accept a real wage reduction in cases of cost-push shocks (Alchian et al., 1972). See also Blanchard and Gali (2009).

<sup>24</sup> Italy was regarded as country with a decentralized wage-setting even in presence of national labor contracts because of the high fragmentation between sectors.

in exchange for other outcomes (for instance negotiating on labor income shares or welfare benefits)<sup>25</sup>.

The latter argument may resonate in the opposite direction of the claim that nowadays lower workers' bargaining power (proxied by unionization), compared to the 1970s, might be a sufficient reason to expect lower wage increases and therefore second-round effects (Boissay et al., 2022; on the flattening of the Phillips curve related to the decline of workers bargaining power, see Lombardi, Riggi, and Viviano 2023). Empirically, in the 1970s a cross-country association between inflation and indexes of workers bargaining power does not emerge (Black, 1982). This finding is plausibly influenced by two opposing effects: on the one hand, union's power might have fostered higher wage claims, on the other side, higher union's power fostered in several countries the capacity to build up more cooperative and farsighted labor markets arrangements. In a literature review, Flanagan (1999), maintains the empirical association between centralized bargaining systems and inflation in the Seventies and the Eighties, but suggests caution in deriving clearcut policy implications, as these findings might be driven by several interdependent country-specific institutional features and time-specific conditions.

All in all, labor markets might play a significant role in inflation persistence to the extent they untie wage dynamics from underlying productivity, chiefly, but not only, through automatic wage indexation to prices. The experience of the 1970s suggests that cooperative wage bargaining mechanisms, as far as they contributed to anchor wage dynamics to underlying productivity, seemed helpful to contain inflation dynamics.

#### ***4.2 The evolving institutional framework in advanced economies: then and now***

In this section, we discuss how the institutional factors we have discussed have evolved since the 1970s across advanced economies. We acknowledge that these factors are multifaceted and the task to assess them synthetically and consistently over a large period is not trivial. As far as we can, we rely on the available quantitative indexes that allow for consistent comparisons over time and across countries.

As we mentioned, central banks' independence has grown over the decades in advanced

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<sup>25</sup> In a similar vein, Calmfors and Driffil (1988) show that highly centralized systems with national bargaining seem to perform well in terms of unemployment and inflationary outcomes since "large and all-encompassing trade unions naturally recognize their market power and take into account both the inflationary and unemployment effects of wage increases". The authors also add that highly decentralized systems with wage setting at the level of individual firms perform well, while the worst outcomes are found in systems with an intermediate degree of centralization. The authors depict a reverse-U shape relationship between unemployment and the degree of centralization of wage settings, concluding that "extremes work best".

economies with the aim to enhance anti-inflation credibility. This emerges also from a synthetic index, in the new panel database provided by Ramelli (2022). The index is based on updating and enriching existing indexes of both political and economic independence. Interestingly, the work expands the country-specific time series up until 2017. In Figure 12 we show the indexes for 1972 and 2017 for some advanced economies. Almost all countries have seen a significant increase in central bank independence over time. That is driven to a large extent by the monetary integration of most European countries that share their monetary policy through the European Central Bank. However, there is a clear-cut positive trend in overall independence even among countries outside the Eurosystem.

As for the labour market, the degree of conflictuality, which was regarded as a driver of inflation persistence during the Seventies, is nowadays much less acute. Moreover, there is a widespread awareness of the unsustainability of automatic wage indexation mechanisms and their ineffectiveness as a tool to protect workers purchasing power in the longer term, at least as conceived in several countries in the Seventies. Such schemes are now relatively limited, as it results from the OECD/AIAS database (Visser 2019): a dummy variable assesses whether automatic wage indexation to the consumer price clauses is present to a significant extent in collective agreements (Figure 13). Such clauses were indeed widespread across countries during the early 1970s, but they are now almost non-existent in advanced countries.

The latter mitigates the risks of second-round effects materializing as in the past: a recent analysis has found that before the 1990s a large part of the inflationary effect of oil supply shocks in Europe was driven by second-round effects, fueled by wage and price setting behaviours (Battistini et al., 2022).

Concerning fiscal policies, we make some quick qualitative remarks on the different regimes into which fiscal policies operate in advanced economies comparing now and fifty years ago. First, during the 1970s, several countries pursued expansionary fiscal policies that were not temporary measures tied to countercyclical considerations, but long-term oriented. Such fiscal stances were allowed by larger possibilities to draw resources by monetary financing, an issue tied with the previously mentioned central bank independence. Second, such fiscal imbalances were mostly driven by current expenses increases rather than by public investments (Ciampi, 1981, Bordo, Bush and Thomas, 2022). The latter may have a less pronounced inflationary impact to the extent to which they foster an increase in potential output in the long run<sup>26</sup>. Overall, recent findings indicate a decrease in the inflationary impact of public deficits since

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<sup>26</sup> The impact of investments on potential output, and therefore on medium-run inflation, has been recently analyzed by Fornaro and Wolf (2023).

the 1980s (IMF, 2023). It suggests that in a changed fiscal policy regime, temporary and countercyclical expansionary fiscal policies, not being associated with expectations of long-term demand pressures, might have a smaller inflationary impact.

Specifically, in the European Union context, in order to coordinate fiscal policies and ensure their soundness, countries agreed to sign a fiscal compact in 2012 within the Treaty on Stability, Coordination, and Governance in the Economic and Monetary Union. The effectiveness of this compact and the proposals for its reform have been and are a subject of debate and proposals of review. Tackling such a discussion is beyond the scope of this paper. Nevertheless, it is worthy to note that authoritative reform proposals, to the extent to which they propose additional room for expansionary policies, typically allow it to pursue temporary countercyclical measures and/or in the form of larger public investments (See for instance Bruni et al. 2022; European Commission 2023; on the debate on reforming fiscal rules to make more space for public investments, see Balassone and Franco, 2000).

Overall, the picture of a more solid anti-inflationary institutional setting in the U.S. emerges in the empirical analysis of Blanchard and Galí (2009) and Blanchard and Riggi (2013), who compare the impact of the oil shocks of the Seventies with those of the end of the Nineties and the early 2000s. The effect of an increase in the oil price has changed over time and has become smaller, with three factors held mostly responsible: the decrease in real wage rigidities, the increased credibility of monetary policy that led to a substantial reduction in the response of expected inflation to oil shocks, and the lower share of oil in consumption and production.

## **5. What contributed to inflation persistence? A quantitative assessment**

In this section, we perform an econometric analysis aimed at measuring the impact of the oil shock and the relative contribution of the set of institutional factors and economic policies discussed in the previous sections. In order to evaluate the macroeconomic effects of an oil shock, we estimated a Structural Vector Autoregression (SVAR) model including several variables that characterize the economy and the economic policies put in place. To this end, we build a medium scale VAR specification at quarterly frequency with seven variables: oil inflation, consumer inflation, GDP growth, nominal earning growth, exchange rate changes, policy rate, and the annual deficit over GDP.<sup>27</sup> The VAR is estimated using Bayesian methods

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<sup>27</sup> Oil inflation is computed y-o-y variation of WTI oil price (source: Fred Database); consumer inflation is the y-o-y inflation rate of source (source: BIS, statistics Warehouse); the y-o-y growth rate of Gross Domestic Product (volume estimates, seasonally adjusted annual levels); the y-o-y changes of hourly earnings of the manufacturing sector (seasonally adjusted indexes; source: OECD); y-o-y changes of the nominal effective exchange rate, index (source: Refinitiv Datastream); monetary policy rate (source: IMF, International Financial Statistics); annual deficit over GDP is calculated as a four quarters moving average (source: IMF, International Financial Statistics).

with a sample running from 1960 to 1990 for three separate countries: Italy, Germany and the United States.

The VAR specification, with constant parameters, is the following:

$$y_t = \sum_{\ell=1}^p B_{\ell} \cdot y_{t-\ell} + u_t, \quad u_t \sim N(0, \Omega).$$

In order to identify an exogenous oil shock we assumed a simple triangular (Cholesky) decomposition of the covariance matrix  $\Omega$ , where oil inflation is put as the first variable.<sup>28</sup>

Figure 13 plots the responses of the Italian economy to a large shock (ten standard deviations) in the rate of change of oil prices. The evidence suggests that an oil price shock triggers a large and persistent rise in inflation (lasting more than 20 quarters), along with a severe weakening in GDP dynamics in the first 10 quarters, before undertaking a gradual recovery, clearly resembling a strong and negative supply shock. The upward response of inflation is accompanied by a rise in earning inflation and a depreciation of the nominal exchange rate.<sup>29</sup> The responses depict a policy mix having a monetary restriction suggested by a persistent increase in the policy rate but also a fiscal expansion, with the deficit over GDP expanding. The same exercise for the US (Figure 14) shows how the response of inflation, GDP and earning growth is similar in shape with respect to Italy, even though the response of the policy rate in US depicts a rise with a significant delay. The picture looks very different in Germany (Figure 15): according to the VAR the oil shock induces a recession, but does not trigger a marked and persistent positive response of consumer inflation, and earning inflation does not increase significantly; also the interest rate reaction in Germany was mild, arguably because the increasing path of interest rates started well before the oil crisis in response to inflation and GDP heating in the early Seventies.

Next, focusing on Italy we perform a counterfactual exercise following Baumeister and Benati (2013) *Zeroing Out strategy*: we shut down the response of selected endogenous variables to the oil shock. This analytical exercise allows us to isolate the contribution of monetary policy, fiscal policy and earning dynamics to inflation persistence and GDP growth, conditioning on the large supply shock. Figure 16 shows the counterfactual response of some variables in Italy to the oil shock when the monetary policy response is zeroed-out: the GDP contraction would have been smaller in magnitude and characterized by a faster recovery, at the expense of a much more persistent consumer and earning inflation.

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<sup>28</sup> Results are robust to changes in the order of variables positioned after oil inflation.

<sup>29</sup> The sizable depreciation of the Lira between 1973-1976 fueled imported inflation.

Figure 17 shows the counterfactual response to an oil shock if fiscal policy and earning inflation in Italy are zeroed out: the rise in consumer inflation would have been much less persistent, vanishing in a few years (less than 18 quarters). Similarly, the negative shock on GDP would have dissipated faster. In these circumstances, the response of the policy rate could have been milder, attenuating the monetary restriction that was implemented. In other words, fiscal policy and wage pressures to aggregate demand gave a crucial contribution to inflation persistence making a huge monetary restriction necessary to tame inflation, a tightening that might otherwise have been much smaller.<sup>30</sup>

## 6. Conclusions

In this paper, we presented some stylized facts related to the oil shocks that hit the world economy in the Seventies causing an inflation outburst that proved to be highly persistent in some countries. By focusing on the U.S., Germany, and Italy, we showed that the effects of, and the responses to the shocks were heterogeneous after the first shock in 1973 and more homogeneous after the second in 1979. Overall, the response of monetary policy is generally judged as initially insufficient and was not able to curb inflation in the Seventies. A severe monetary tightening was put in place after the second oil shock concurring to determine economic slowdowns, where not recessions.

The initial ineffectiveness of monetary policy is closely tied to the end of the Bretton Woods era. The gold exchange standard, characterized by a fixed exchange rate regime and the currency peg to gold, collapsed in 1971 and resulted in the loss of a consolidated framework for monetary policy conduct. It took another two decades for a new framework to be established, centered around the commitment of independent and credible central banks to achieve specific inflation targets.

In addition to the role played by monetary policy, we showed that several institutional aspects affected the heterogeneous inflation outcomes in advanced countries. In particular, the evidence produced suggests that the lack of central bank independence, the institutional features of labor market – namely wage indexation and the low degree of cooperation in industrial

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<sup>30</sup> Zeroing out the response of monetary policy in the US show much less conclusive results in comparison with the benchmark responses. Also in the case of Germany, the counterfactual exercise regarding monetary policy does not provide a significant difference with the benchmark; this is probably due not only to the fact the inflationary pressures of the oil shock have been limited, but also to the large degree of CB independence and the explicit announcement of a monetary targeting strategy since the mid-'70s, which led to a strong appreciation of the exchange rate. On the other hand, the counterfactual exercise performed zeroing out the deficit and earning response to an energy shock show similar results for United States with respect to Italy, while there are no significant differences for Germany, where the the responses of earning inflation and deficit/GDP to the energy shock were milder already in the benchmark. These results are available upon request.

relations – along with fiscal policy rules at odds with price stability, significantly contributed to inflation persistence. Using a structural VAR-based analysis we brought empirical evidence, in particular for Italy, on the contribution these factors gave to the stubborn inflation experimented in the Seventies. A counterfactual exercise showed that inflation would have been considerably less persistent and the monetary policy response might have been milder, absent the pressure on price increases exerted by wage dynamics and fiscal policies.

Today, more credible and autonomous monetary policies, different mechanisms of wage indexation and negotiations, together with sustainable fiscal policies, can contribute to inflation not staying high for long. Ensuring that these factors continue to support price stability remains key in limiting inflation persistence.

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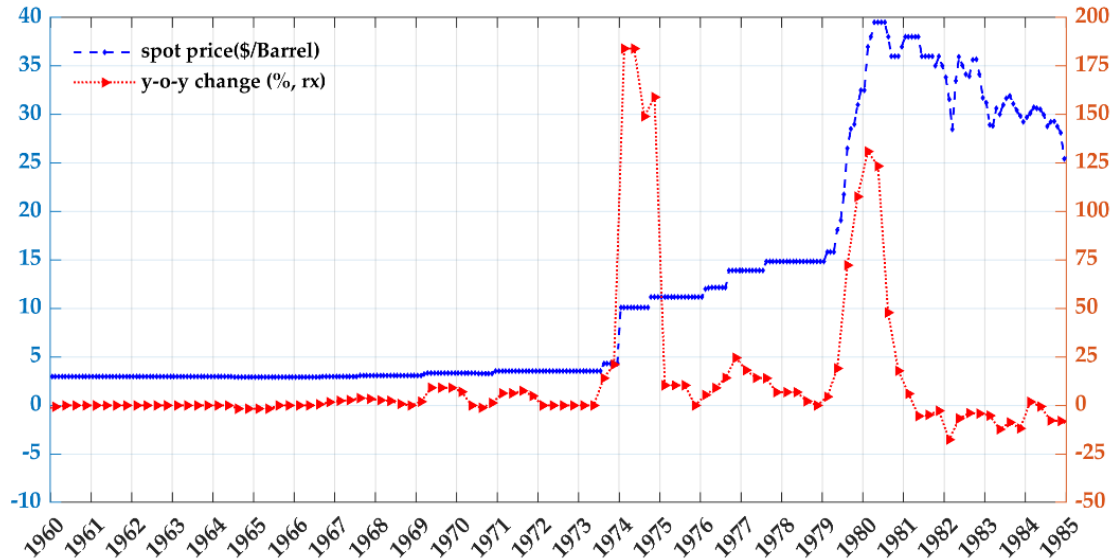


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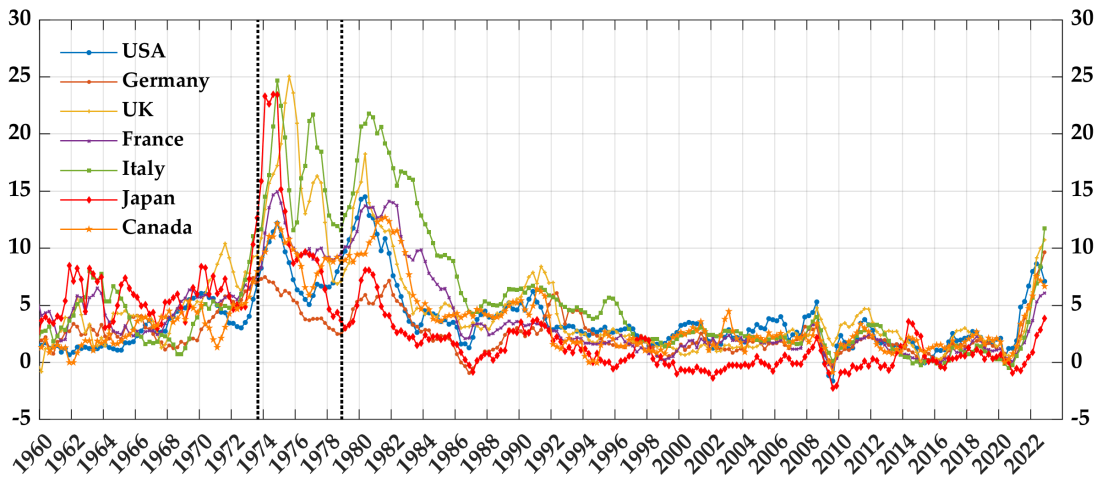
## Figures

**Figure 1. Spot Crude (WTI) Oil price level and growth, 1960-1985**



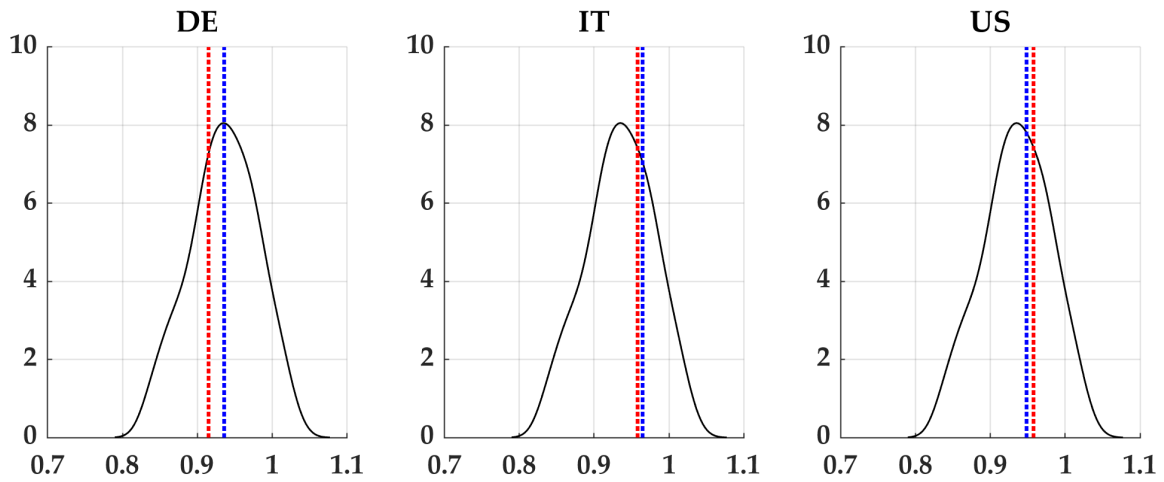
Source: FRED, Federal Reserve Bank of St. Louis

**Figure 2. Consumer inflation in selected countries, 1960-2022**



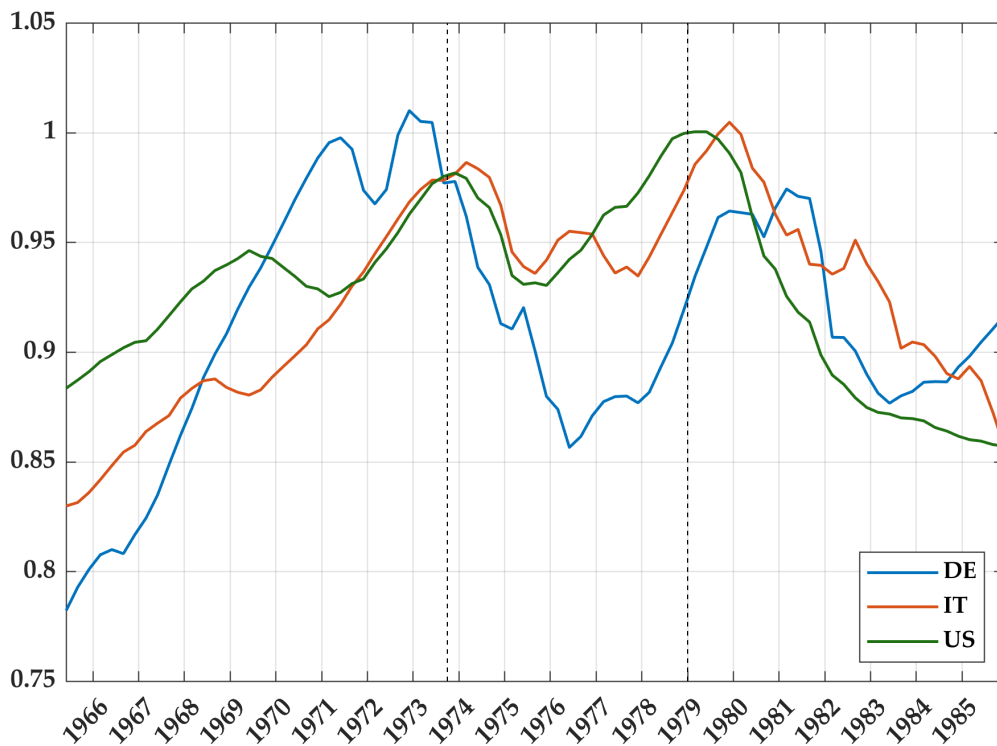
Source: BIS Statistics Warehouse

**Figure 3. Inflation persistence in selected countries: 1973-1977 vs. 1978-1982**



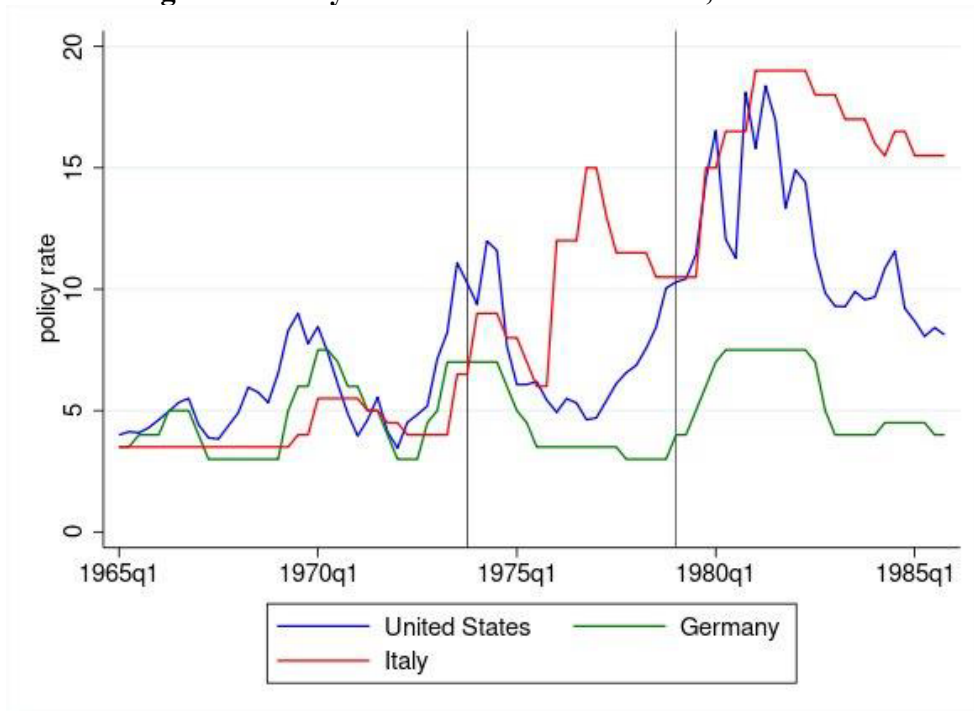
Source: our elaboration on BIS Statistics Warehouse data. Persistence is obtained for each country using a univariate time-varying AR(2) models with stochastic volatility, estimated using Bayesian methodologies. The black line represents the estimated density of inflation persistence in G7 countries in the decade 1972-1982. The vertical dashed lines represent the average persistence in two subsamples: 1973-1977 (red), 1978-1982 (blue).

**Figure 4. Inflation persistence in selected countries, 1965-1985**



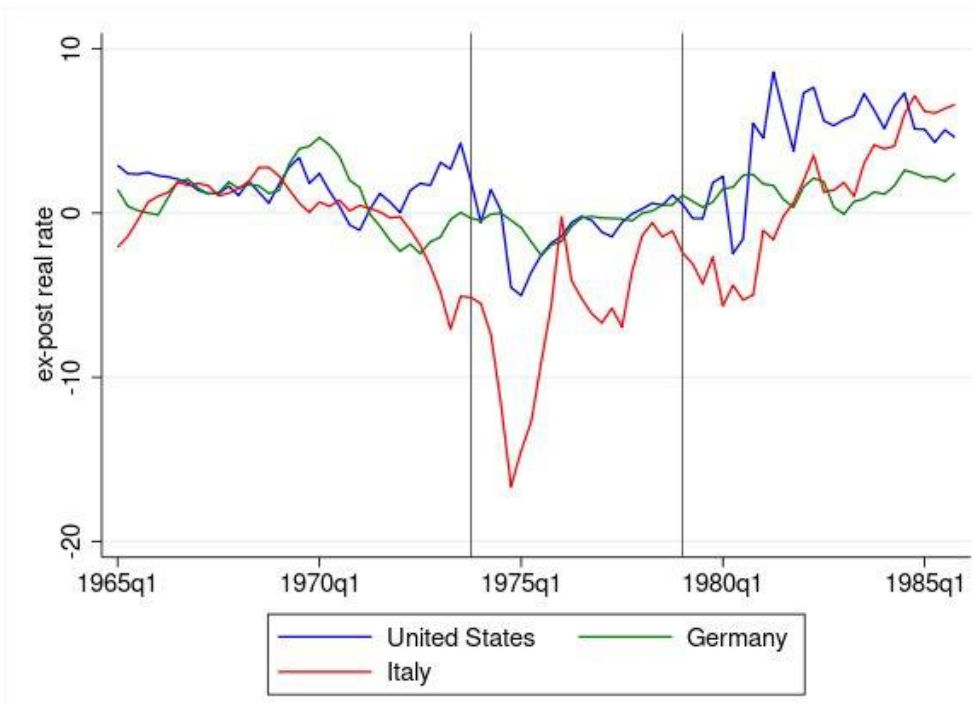
Source: our elaboration on BIS Statistics Warehouse. The solid lines present the posterior median persistence estimated as explained in the note of Figure 3. The vertical dashed lines correspond to the oil shocks.

**Figure 5. Policy rates in selected countries, 1960-1985**



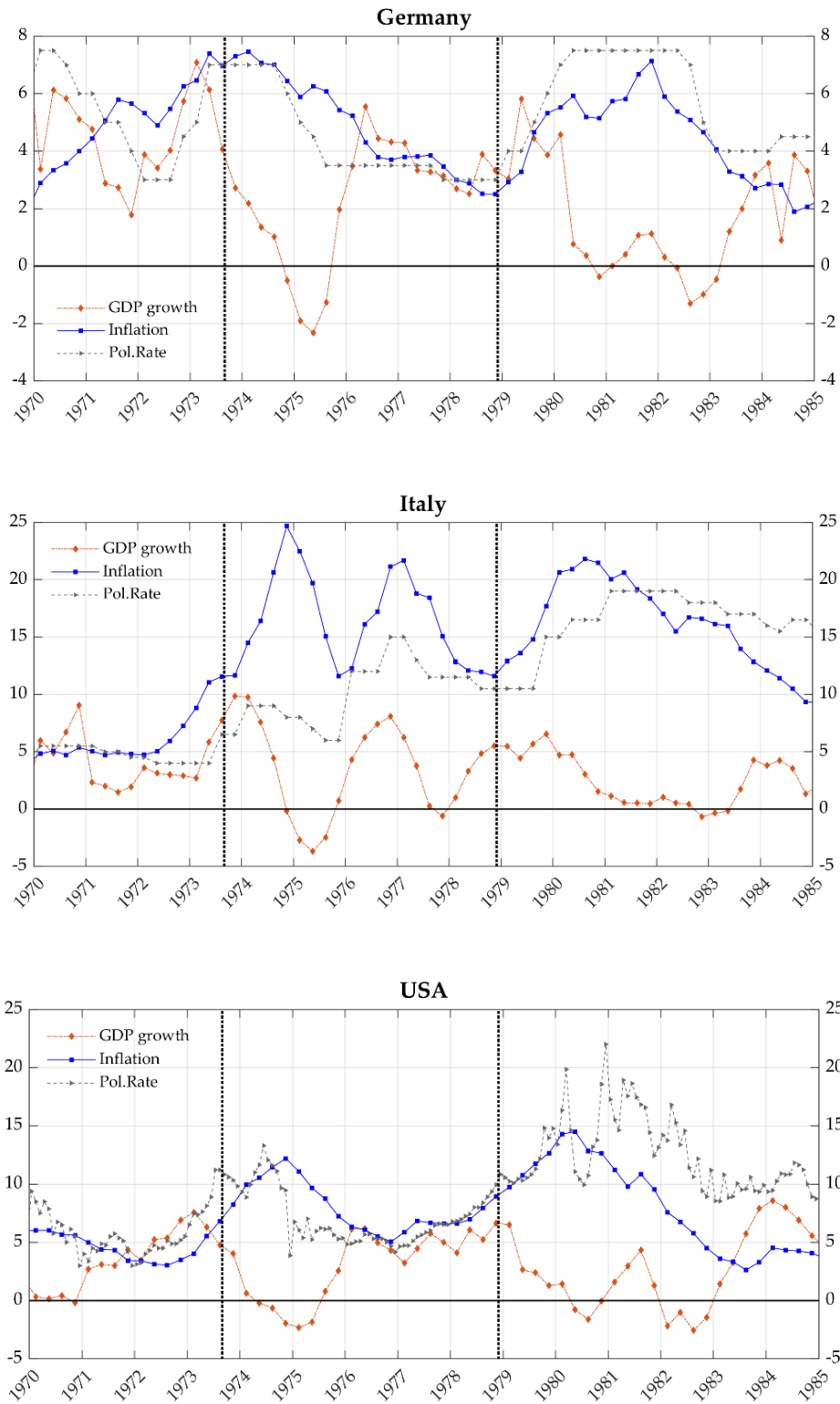
Source: our elaboration on BIS Statistics Warehouse and IFS/IMF.

**Figure 6. Monetary policy stance (*ex-post real interest rate*)**



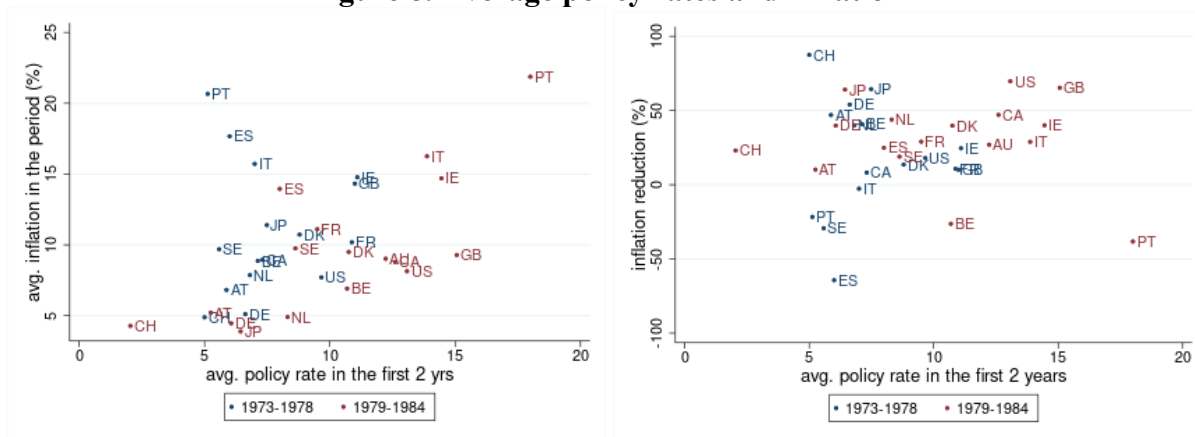
Note: Ex post real interest rates represent a simple and model-independent measure of the monetary policy stance: ECB (2010)

**Figure 7. GDP, inflation and policy rates in selected countries, 1960-1985**



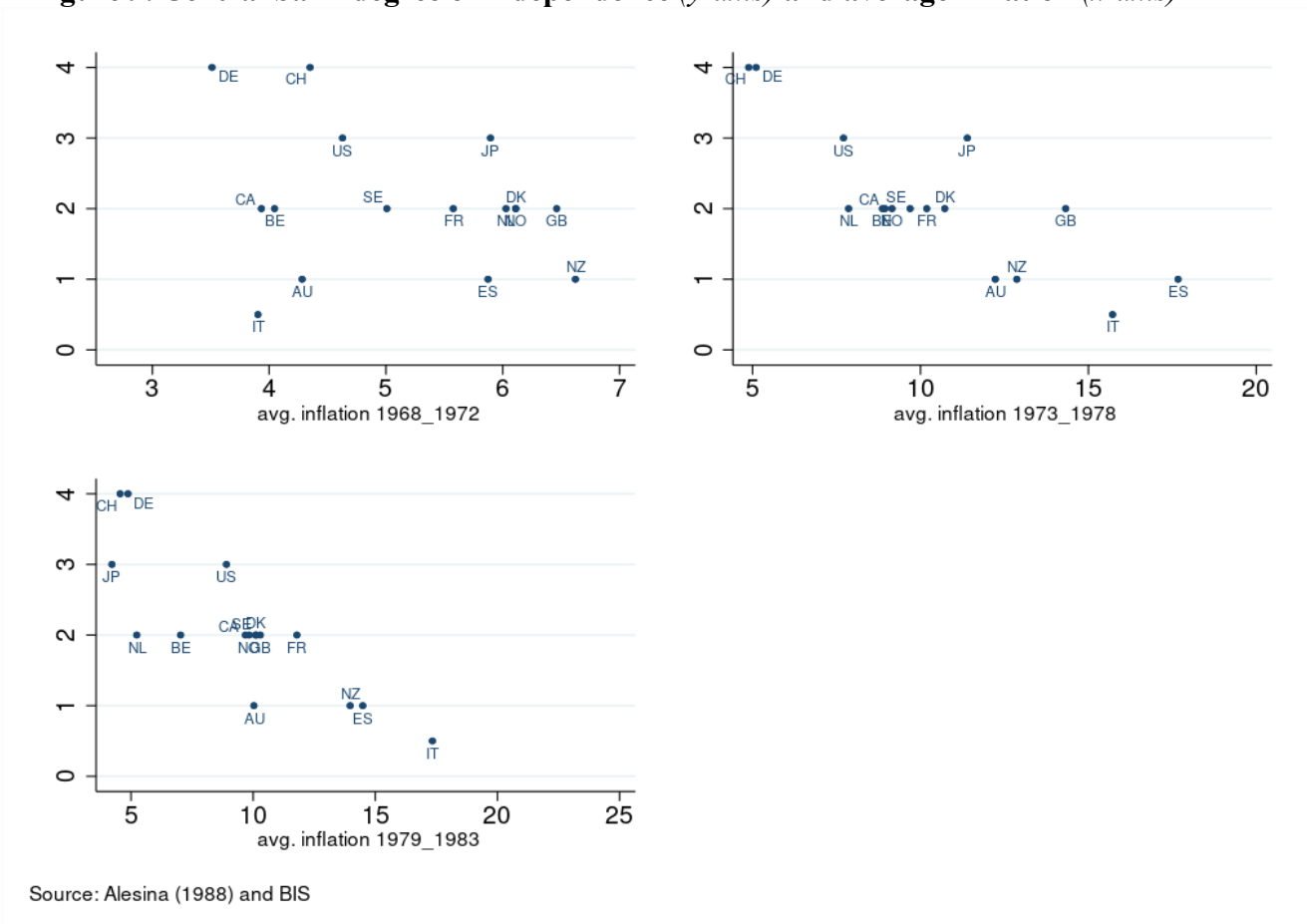
Source: our elaboration on BIS Statistics Warehouse, IMF/IFS and OECD.

**Figure 8. Average policy rates and inflation**



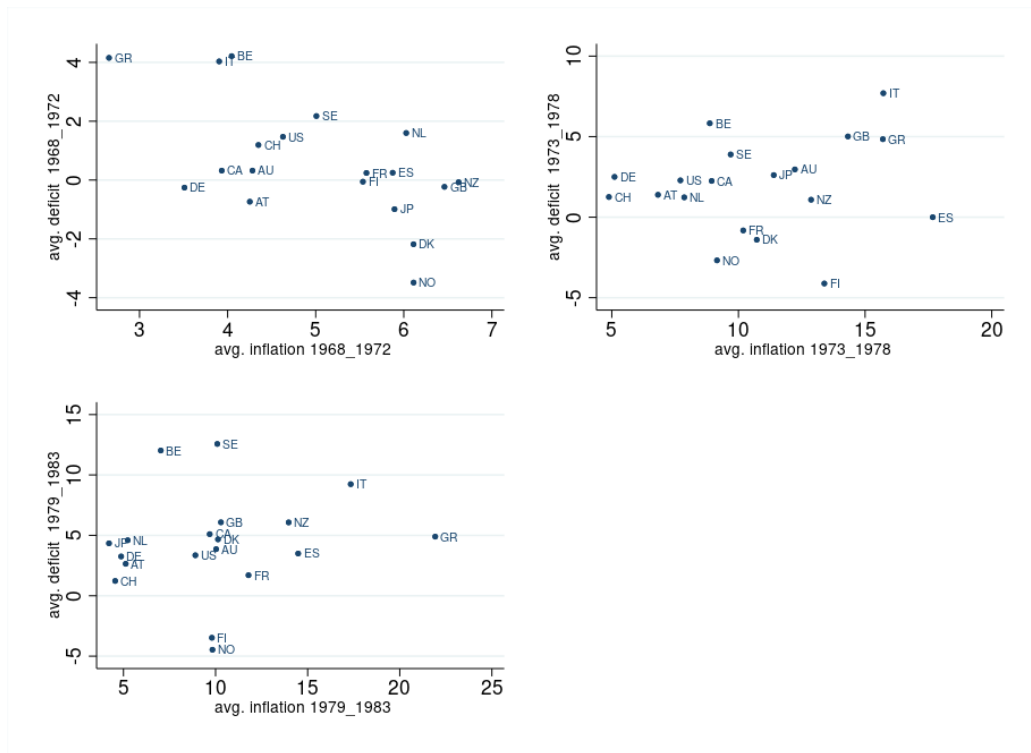
Note: Average policy rates are computed in the 2 years after the two oil shocks (*x*-axis); average inflation (left panel) and inflation reduction (right panel) are computed in the 6 years after the shocks. Inflation reduction is defined as the percentage difference in the average inflation levels between the first and the last two years of the period. Source: our elaboration on BIS Statistics Warehouse, IMF/IFS and OECD.

**Figure 9. Central bank degree of independence (*y*-axis) and average inflation (*x*-axis)**



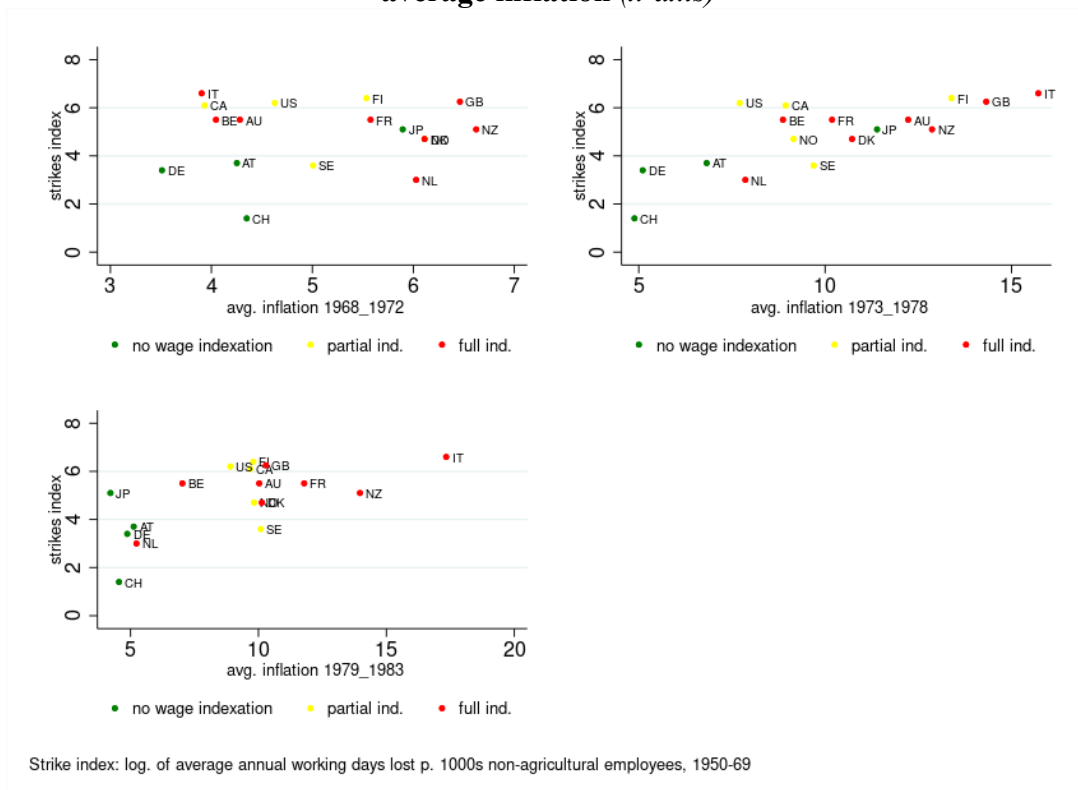
Source: Alesina (1988) and BIS

**Figure 10. Average fiscal deficit to GDP (*y-axis*) and average inflation (*x-axis*)**



Source: our elaboration on BIS Statistics Warehouse and IMF Historical Public Finance dataset (Mauro et al 2013).

**Figure 11. Labor market conflicts (*y-axis*), wage indexation (*colours*) and average inflation (*x-axis*)**



Strike index: log. of average annual working days lost p. 1000s non-agricultural employees, 1950-69

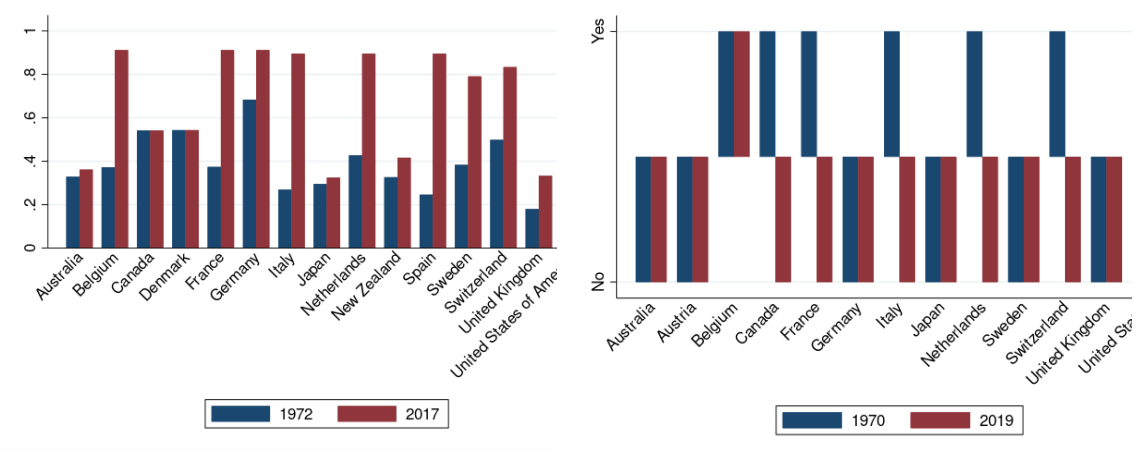
Source: for strike index: McCallum (1983), for wage indexation: Bruno and Sachs (1985).



**Figure 12. Institutional factors in OECD countries, then and now**

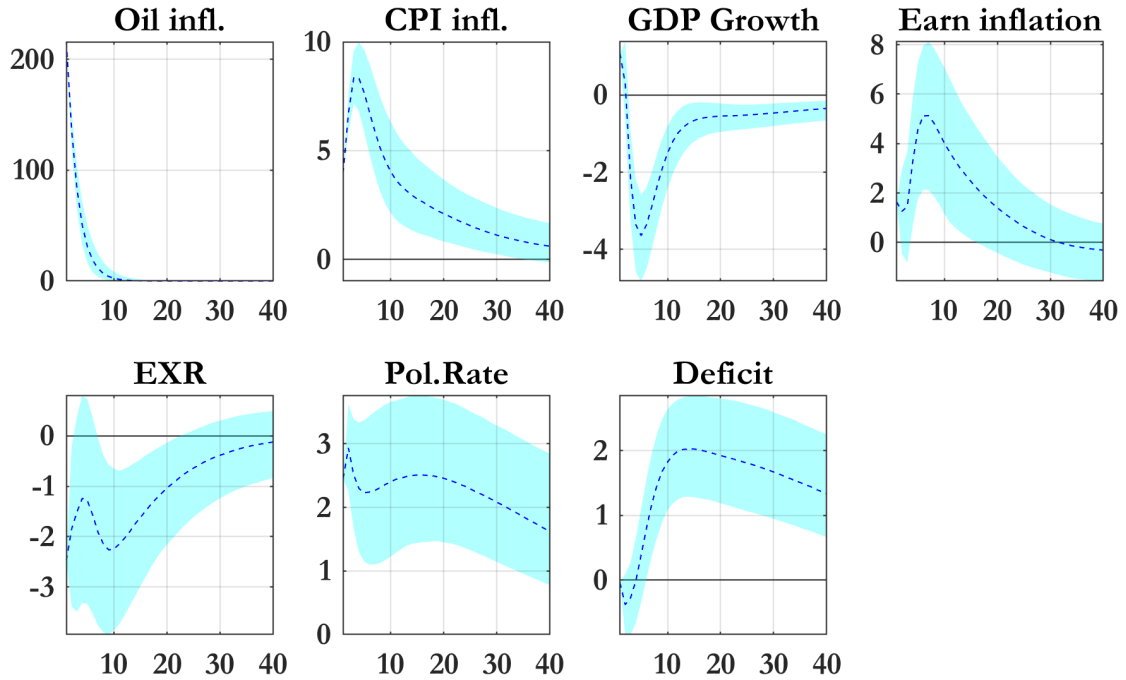
a) Index of Central Bank Independence

b) Automatic wage indexation



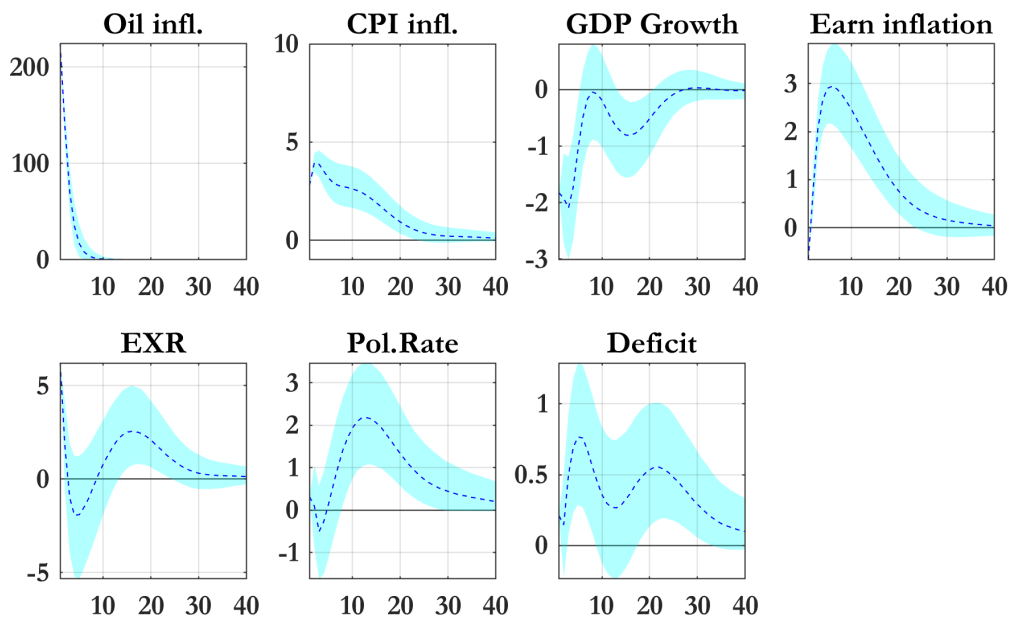
Source: Romelli (2022). The index builds on existing measurements of political and economic central bank independence, providing an expanded time-frame. It is ranged between 0 and 1. Source: OECD/ALIAS ICTWSS database. Note: the variable takes value 1 (yes) if (most or many) collective agreements contain (semi-) automatic index or cost-of-living escalator; 0 (no) if use of index clauses is rare or forbidden.

**Figure 13: Impulse response to oil price shock: Italy**



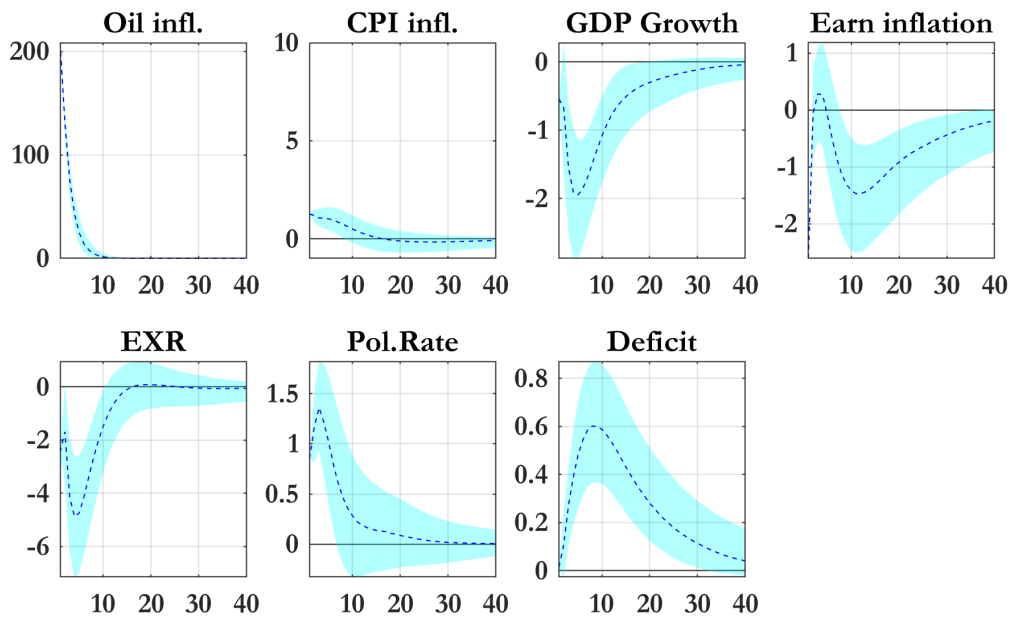
Note: The dashed line is the posterior median, while shaded bands correspond to the 68 per cent credible posterior region

**Figure 14: Impulse response to oil price shock: US**



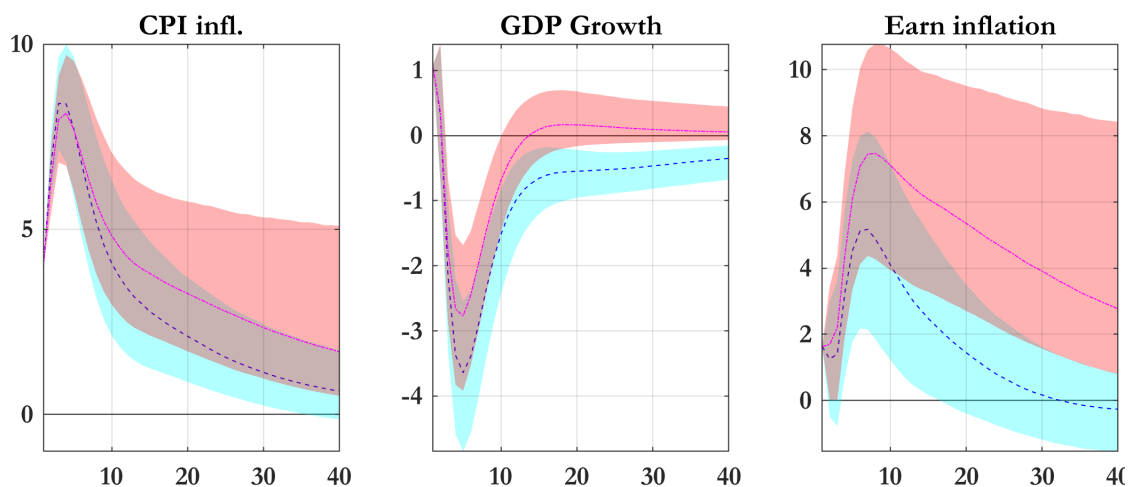
*Note: The dashed line is the posterior median, while shaded bands correspond to the 68 per cent credible posterior region*

**Figure 15: Impulse response to oil price shock: Germany**



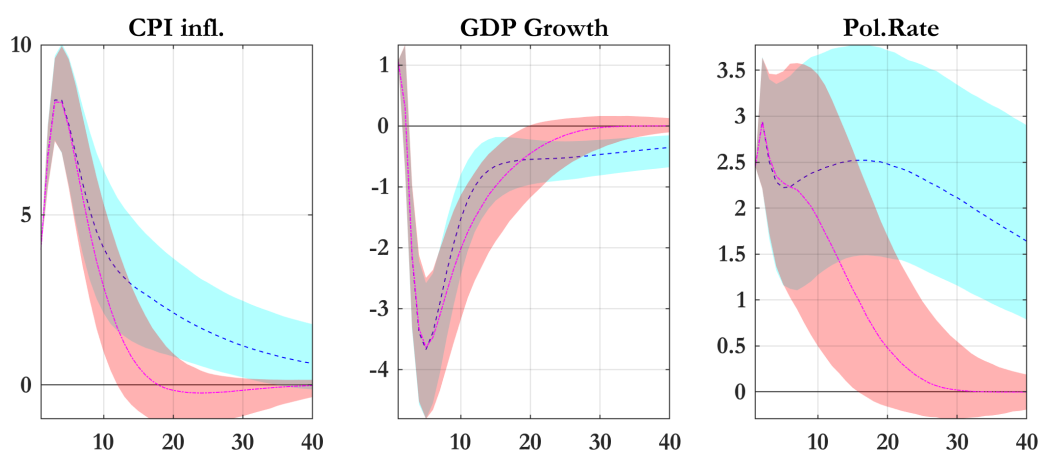
*Note: The dashed line is the posterior median, while shaded bands correspond to the 68 per cent credible posterior region*

**Figure 16. Zeroing out monetary policy: counterfactual response in Italy**



*Note: the blue (dashed line) corresponds to the benchmark scenario, while the red (solid line) represents the counterfactual exercise where the response of the policy rate has been muted.*

**Figure 17. Zeroing out fiscal policy and earning inflation: counterfactual response in Italy**



*Note: The blue (dashed line) corresponds to the benchmark scenario, while the red (solid line) represents the counterfactual exercise where the responses of earnings inflation and deficit/ GDP have been zeroed out.*