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The Price of Hesitation: How the Climate Crisis Threatens Price Stability and What the ECB Must Do about It

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The Price of Hesitation: How the Climate Crisis Threatens Price Stability and What the ECB Must Do about It

Final Report on Behalf of Greenpeace Germany

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Executive summary

This report presents for the first time empirical evidence of the impact of natural disasters on inflation in the eurozone, highlighting the challenges facing the ECB to achieve price stability in the era of the climate crisis. Our results show that natural disasters lead to increases in headline and core inflation, with price increases being higher for food and beverages. The effects are small but significant. We also show that there are significant differences between eurozone countries in the way that inflation is affected by natural disasters.

With an escalation of the climate crisis, the frequency and intensity of climate-related hazards will increase in the eurozone. If past data shows that natural events have already an impact on inflation, this effect can only become stronger as global warming increases, with important ramifications for the ECB's policies and operations. The ability of the ECB to control inflation may be significantly undermined if the world passes the 1.5 or 2 degrees threshold. Therefore, actions that prevent an increase in global warming have an important role to play in allowing the ECB to achieve its primary objective in the future.

The ECB has taken an important step by announcing its new monetary strategy and climate action plan. While this is a critical first move in the right direction, the ECB climate action plan falls short of providing an ambitious agenda consistent with the climate emergency that we are facing.

In this report, we set out how the ECB could develop an ambitious agenda that would help it deliver on its primary and secondary mandates. Concretely, we recommend that the ECB and the European System of Central Banks (ESCB) should:

(i) introduce more explicitly climate performance criteria into their monetary policy tools;

(ii) align prudential regulation with climate neutrality;

(iii) abandon market neutrality as the key principle that guides the design of monetary policy;

(iv) incorporate double materiality and macrofinancial feedback loops in macroeconomic modelling and scenario analysis; and

(v) use more ambitious climate-related criteria in their portfolio management.

The ECB and the ECSB must be bold in their actions to safeguard macrofinancial stability across the eurozone in the face of climate change. As guardians of the financial system, the ECB and the ECSB need to send clear signals to the financial sector that a net-zero transition of the eurozone economy and the financial system is a key target of its policies, and that monetary and prudential frameworks will be adjusted accordingly.

1 Introduction

"I want to explore every avenue available in order to combat climate change. This is something that I hold very strongly and I believe that, as we have this price stability mandate [...], climate change actually has an impact on price stability. If we fail to measure externalities, if we fail to anticipate drought, if we fail to anticipate variations of prices of food, of energy, of services, then we are not doing our job."
Christine Lagarde, Interview with the Financial Times, 7 July 2020.

Climate change constitutes one of the greatest challenges for our economies and societies and will remain so for decades to come. However, until very recently, the European Central Bank (ECB) had not taken action to incorporate climate change into its operations, despite calls to do so. This changed in July 2021 when the ECB announced a detailed roadmap of climate-related actions, as an outcome of its Strategy Review (ECB, 2021a, 2021b). These actions include, amongst others, the incorporation of climate change considerations into its monetary policy tools, the development of climate-related indicators and modelling approaches, the use of climate-related disclosures and the conduct of climate stress testing exercises.

Although the ECB climate action plan is a welcome step, it falls short of providing an ambitious agenda consistent with the climate emergency that we are facing. This lack of ambition is reflected in the timeline of the actions: most of the interventions that have the potential to affect climate targets will not be introduced before late 2022 and their full implementation might not take place before 2025. It is also reflected by the fact that the action plan is too focused on disclosures and the protection of the Eurosystem balance sheet from climate risks, without including a clear set of interventions that would directly incentivise green investment and contribute to the reduction of the financing of polluting activities.

This report has a two-fold purpose. First, it presents for the first time empirical evidence of the impact of natural disasters on inflation in the eurozone, highlighting the challenges facing the ECB to achieve price stability in the era of the climate crisis. Our results show that natural disasters lead to increases in headline and core inflation, with price increases being higher for food and beverages. We also show that there are significant differences between eurozone

countries in the way that inflation is affected by natural disasters. This suggests that if the severity and the frequency of climate-related events in the euro area increases, the ability of the ECB to control inflation will be significantly undermined. Therefore, actions that prevent the increase in global warming have an important role to play in allowing the ECB to achieve its primary objective in the future.

Second, given the urgency of the climate crisis and its importance for the ECB objectives, we explain how the ECB should move beyond the action plan that was announced in July. We recommend that the ECB and the European System of Central Banks (ESCB) (i) introduce more explicitly climate performance criteria into their monetary policy tools; (ii) align prudential regulation with climate neutrality; (iii) abandon market neutrality as the key principle that guides the design of monetary policy; (iv) incorporate double materiality and macrofinancial feedback loops in macroeconomic modelling and scenario analysis; and (v) use more ambitious climate-related criteria in their portfolio management.

The report is structured as follows. Section 2 reviews the channels through which natural disasters may threaten the ECB's price stability mandate and presents novel empirical evidence which shows that the disruptions and damages resulting from natural disasters pose a significant threat to price stability in the euro area. Section 3 highlights the key role that the ECB should play in addressing the climate crisis and discusses the rationale behind ECB's recently announced climate action plan. Section 4 critically discusses the ECB roadmap of climate-related actions and makes recommendations on how this roadmap can become more aligned with the climate crisis that we are facing. Section 5 concludes.

2 How natural disasters threaten price stability

The Treaty on the Functioning of the European Union (TFEU) defines the objectives of the ESCB. Article 127, paragraph 1, of the Treaty states that the ECB's primary objective "shall be to maintain price stability". According to the ECB's original monetary policy strategy, price stability is achieved if a "a year-on-year increase in the Harmonised Index of Consumer Prices (HICP) for the euro area of below two percent" is reached. This was modified in July 2021 as part of the

ECB's Strategy Review – the Governing Council agreed to set a symmetric inflation target of two per cent over the medium term (ECB, 2021a).

In this section, we outline how climate change, and the associated increase in the frequency and severity of climate-related disasters, may pose a threat to achieving this goal. We proceed in three steps. First, we explain the channels through which weather events can affect inflation rates. Second, using data for the euro area during the period 1996-2021, we estimate econometrically the quantitative impact of natural disasters on inflation rates. We initially look at the effects for the euro area as a whole and we then disentangle these effects for the four largest euro area economies, namely France, Germany, Italy and Spain. Third, we relate the results of our analysis to those for the entire globe and provide an outlook on the importance of weather events for achieving price stability in the future.

It is important to highlight that even though our empirical analysis is backward-looking, it has critical implications for the future of central banking in Europe. As is well-known, climate change is affecting our economies and societies in a non-linear way: the climate-related economic and social effects are expected to become more severe if we pass the 1.5 or 2 degrees threshold. Therefore, the past might not be a good guide for the future. However, if past data shows that natural events have already an impact on inflation, this effect can only become stronger as global warming increases, with important ramifications for the ECB's policies and operations.

2.1 From natural disasters to inflation: which are the transmission channels?

Natural disasters can affect inflation rates in various ways, creating both upward and downward pressures on prices. Yet, it is unclear ex ante, which of these countervailing forces dominate. On the one hand, inflation can go up since weather disasters may destroy crops, buildings and infrastructure and thereby cause negative supply-side shocks (Batten et al., 2020; Simola, 2020). These shocks can increase the costs of domestic producers and can create spill-over effects to foreign importers. Furthermore, transportation costs might rise due to damaged infrastructure or the need to import the goods from abroad, again causing upward pressures on prices and creating spill-overs across countries (Klomp and Seruyange, 2020). From the demand-side, natural disasters

often spur reconstruction efforts, which may cause a temporary local boom in the prices of reconstruction goods.

On the other hand, inflation can also go down in the aftermath of a natural disaster. For example, the destruction of houses and physical capital of firms can diminish wealth, leading to reduced consumption and firm investment. This holds true even if households and firms are insured against losses from disasters: first, the higher insurance costs can prevent additional consumption and investment; second, if weather shocks occur more often and more strongly due to climate change, the insurance costs will likely increase. Moreover, higher loan defaults in the aftermath of a natural disaster can cause a decline in the credit provision by banks, reinforcing the decline in consumption and investment. Empirical research has also shown that climate vulnerability influences the availability and cost of corporate capital (Kling et al., 2021).

With the coexistence of upward and downward pressures on prices, it is difficult to predict the exact inflation effects in the aftermath of natural disasters. In addition, it might turn out that consumer prices of some goods fall, while prices of other items increase. Our empirical analysis aims to shed light on which of these countervailing forces dominate for each consumption category. Going forward, we hope that analysis such as this will help to anticipate price changes more accurately in the aftermath of major weather events.

Before we proceed to present our empirical results, one additional point is in order. Climate-related events can affect the transmission channels of monetary policy since they can affect expectations, asset prices, credit supply, interest rates and other factors that play a significant role in the process via which changes in the policy rates affect inflation (see NGFS, 2020). Our econometric analysis does not focus on this issue, which is left for future research. However, the consideration of these implications of climate change would reinforce the argument that climate change can undermine price stability.

2.2 Quantifying the effects

In this section, we present the results of our empirical analysis. In this analysis, we use regression models to estimate the monthly responses of headline inflation and its main sub-indices to disaster events and the implied monetary damage that these events cause. We use disaster data on storms, floods, droughts,

heat and cold waves, earthquakes and volcanic eruptions in the period from 1996 to 2021.[1]

To estimate the response of headline inflation and its main 12 sub-indices, we use data on the Harmonised Index of Consumer Prices (HICP) for all euro area countries. This bears the advantage that the statistical methods to compile the data are harmonised across countries, such that price indices are directly comparable across countries. More importantly, the HICP constitutes the primary variable of interest for the ECB's monetary policy strategy. Disturbances to this variable therefore pose a direct threat to the fulfilment of the price stability mandate and a call for ECB action to reduce eruptions in its main target variable.

In a first step, we employ panel regressions for all euro area countries to estimate the average inflation responses to natural disasters. However, a limitation of this approach is that it cannot capture the potential existence of opposing price responses in the individual countries. While consumer prices might rise in some countries, they may fall in other countries. To account for the country-specific responses, we run additional country-by-country regressions for the four largest euro area economies, namely France, Germany, Italy and Spain, to investigate whether inflation responses differ across countries.[2] Details on our empirical methodology and the data can be found in in Appendix A.1.

[1] We are aware of the fact that the latter two are not directly related to climate change, but rather result from tectonic processes. However, recent research indicates that climate change may, in the very long run, contribute to an increase in these processes. This, in turn, may induce earthquakes and volcanic eruptions to increase (Carrivick et al., 2018; Masih, 2018). Moreover, excluding earthquakes and volcanic eruptions from our econometric investigation does not significantly alter our results, as they make up only a minor share of overall disasters. This is why we include them in our analysis.

[2] This is likely to happen as the disaster composition varies across countries. Unfortunately, we do not have enough observations for each event type to differentiate the inflation responses across disaster types. This is why we rather look at the differences between the four largest euro area economies, as the number of observed disasters is also largest for these four countries.

2.2.1 Euro-area-wide effects

In this section, we investigate how inflation rates are impacted by the estimated damage that natural disasters cause in the euro area (see empirical model (1) in Appendix A.1). First, we look at the response of overall headline inflation, i.e. at the index of consumer prices that includes all product categories.[3] Second, we assess the effects on core inflation. This measure excludes items from the sectors of energy, food and beverages as well as alcohol and tobacco, because prices of these goods are more volatile. Third, we estimate the effects of disasters on the 12 sub-indices of headline inflation. Finally, we further disaggregate the price data for the sub-index of food and beverages, as this consumption category is most strongly affected by natural disasters.

All the empirical results are reported in Appendix A.2. Table 1 shows the effects of natural disasters, taking place in the past 12 months, on monthly headline inflation rates in the euro area. We find that headline inflation significantly increases for events that took place in the past 8 months (for lags 1 up to 8). This indicates that upward price pressures, resulting, for instance, from resource shortages due to the destruction of crops, buildings and infrastructure, seem to dominate in the short run. For longer lags, the price effects seem to be reverted, such that downward price pressures dominate. This suggests that, in the medium run, the decline in aggregate demand that results from natural disasters overcompensates any inflationary pressures that might stem from supply bottlenecks or reconstruction-led demand.

Our results remain valid after successively including further control variables. These control variables account for other driving forces of inflation and ensure that our estimates for the disaster variable solely capture the disaster effects. For our richest specification that includes various control variables (column 8), we find that an increase in climate disasters in t-1 by one percentage point of monthly GDP leads to a rise in inflation by 0.03 percentage points. This effect is small, but still suggests that natural events can have a significant effect on inflation rates if their intensity and severity increase the future.[4] The summary

[3] For details on the classification of the individual consumption categories, see: https://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=prc_hicp_midx&lang=en.

[4] We must also take into account that natural disasters have primarily occurred locally so far, and, as a result, their effects might not have been very visible at the national and eurozone level.

statistics at the bottom of Table 1 indicate a decent model fit for our specification (8) of 0.83.

We now turn to present the effects of natural disasters on core inflation (see Table 2). Excluding prices for food and beverages, alcohol and tobacco and energy does not change our main results. We still find that weather disasters significantly increase inflation rates. Interestingly, we do not find a reversion of price effects at lag 12, such that upward price pressures seem to be even stronger for core than for headline inflation. For our specification (8), we even find a model fit of 0.90. This is why we use this specification as benchmark model for the analysis of the disaster effects on the 12 sub-indices of headline inflation and the sub-categories of food prices.

When we regress the 12 main sub-indices of headline inflation on our disaster variable, we find large differences at the sub-index level (see Table 3). While we observe strong and positive effects on food price inflation in the direct aftermath of a weather shock, i.e. at t and t-1 (see column 1), effects are much weaker or even negative for other sub- indices of headline inflation. Demand for alcohol and tobacco (column 2) as well as for furnishings and household equipment (column 5) seems to decrease instantaneously following disasters, such that prices for these consumption categories decline. We find ambiguous effects for the sectors of health (column 6), transport (column 7) and miscellaneous goods (column 12), that suggest that both upward and downward price pressure are at work for these consumption categories. In sum, our results suggest that natural disasters have small, but significant effects on all of the 12 main sub-indices of overall headline inflation.

As the immediate price effects are strongest for food and beverages, we look at further sub-categories of this sub-index (see Table 4). We find that the increase in food price inflation is mainly driven by a significant increase in the prices of fruits and vegetables (columns 7 and 8). This makes sense, because the destruction of crops and harvests and the resulting shortage in these goods puts upward pressures on their prices.

The strong increase in food price inflation in the direct aftermath of a natural disaster is also worrisome from a distributional perspective. As poorer households spend a larger share of their income on food, they are also hit harder by increases in food price inflation than wealthier households. This implies that

climate change does not only pose a threat to maintaining price stability, but may also have distributional consequences, because prices of different items are not equally affected by natural disasters.

The results on our euro-area-wide analysis on the inflationary effects of natural disasters let us draw five preliminary conclusions:

1. natural disasters lead to statistically significant increases in headline and core inflation;
2. there are significant differences at the sub-index level;
3. price increases are strongest for food and beverages;
4. the price effects lead to eruptions in inflation rates that make it more difficult for the ECB to fulfil its price stability mandate; and
5. beyond that, the price effects may also have distributional consequences.

2.2.2 Country-specific effects

In this section, we present the results from our empirical analysis on the effects of natural disasters on headline inflation and its sub-indices in France, Germany, Italy and Spain.[5] This country-specific analysis is important, because opposing price reactions in individual countries might offset each other at the panel level. To disentangle the euro-area-wide inflation responses, we perform Ordinary Least Squares (OLS) regressions for France, Germany, Italy and Spain to estimate how inflation rates change following disasters in these four countries (see Appendix A.1 for details on the empirical methodology).

When we compare the country-specific responses of headline inflation (Tables 5 to 8) to the euro-area-wide response (Table 1), we find that inflation rates indeed react more strongly in the individual member countries. Moreover, the results differ significantly across the four countries. While headline inflation decreases in Germany (Table 6), the results are more ambiguous in France (Table 5) and Italy (Table 7). In the former, upward price pressures seem to outweigh downward pressures. In contrast, declines in headline inflation slightly dominate the overall inflation response in Italy. For Spain, we find increases in headline inflation for disasters at lags 9 and 11 (Table 8), yet no

5 We focus on these four countries since – due to their size – they play an important role in the monetary policy decisions of the ECB.

significant effects for all other lags as well as for our benchmark specification (8).

The results for headline inflation remain valid, if we exclude prices for energy, food and beverages as well as for alcohol and tobacco. The disaster effects on core inflation are slightly weaker and less significant than for headline inflation in France, Germany and Spain (Tables 9, 10 and 12). However, they still confirm the finding that natural disasters significantly affect inflation rates. For Italy, we find stronger effects on core than on headline inflation (Table 7).

To disentangle the diverging price responses across the individual consumption categories, we regress the 12 main sub-indices of headline inflation in the 4 individual countries on our disaster variable. This is important because opposing price responses at the sub-index level might cancel each other out if we only focus on headline inflation.

We indeed find diverging price responses in France (Table 13), with increases in inflation of food prices (column 1), transport (column 7), education (column 10) and miscellaneous goods (column 12) and ambiguous or negative price effects for the remaining sub-indices. In contrast to our results for the euro area, prices of alcohol and tobacco (column 2) increase in the direct aftermath of a disaster in France. This suggests that extreme weather events adversely affect and push up prices for viticulture, which makes up a significant share of French agricultural output (Eurostat, 2018).

In a next step, we want to assess which other food items are most strongly affected by weather disasters in France (Table 17). In contrast to our euro-area-wide analysis, we find positive and significant effects on prices of bread and cereals (column 2), meat (column 3), fish and seafood (column 4) as well as of milk, cheese and eggs (column 5). These results make sense, because these categories make up the majority of French agricultural products (Eurostat, 2018). The destruction of harvests following storms, heat waves and droughts puts upward pressures on their prices and leads to significant increases in inflation. In contrast, fruit and vegetable price inflation (columns 7 and 8) seems to decrease following natural disasters. These results show how important it is to disentangle the price effects at the sub-index and further sub-category-level, given that opposing price responses might offset each other at the aggregate level.

In Germany, we find that the negative effects on headline inflation also prevail at the sub-index level (Table 14). As the agricultural sector is smaller in Germany than in France (Eurostat, 2020), upward price pressures due to the destruction of crops are outweighed by downward price pressures for food and beverages (column 1). We further find that declines in inflation rates are predominant for most sub-indices and mirror the response of aggregate headline inflation in Germany. This is also true for the sub-categories of food price inflation (Table 18), for which downward price pressures largely outweigh upward price pressures.

The inflation responses at the sub-index level are more ambiguous for Italy and display many sign changes (Table 15). This indicates the coexistence of both upward and downward price pressures. The results might also reflect the different disaster composition in Italy as compared to Germany and France. In addition to floods and storms that prevail in the latter two countries, Italy has experienced numerous earthquakes. While the literature suggests that consumer prices increase after floods and storms (see Heinen et al., 2019), they are more muted or even decline following earthquakes (see Cavallo et al., 2013; Doyle and Noy, 2015).[6] The ambiguity of the price responses is also reflected in the sub-categories of food prices (Table 19), that show both increases and declines in the inflation rates of the individual food categories.

We find a similar picture for the inflation rates of the sub-indices in Spain, where both upward and downward pressure coexist (Table 16). While prices increase for alcohol and tobacco (column 2) as well as for recreational and cultural goods (column 9), inflation rates of the remaining sub-indices show ambiguous or negative signs. Food price inflation seems to decline in Spain (Table 20), with negative price effects prevailing for the majority of food price sub-categories.

In sum, the tremendous differences in the inflationary responses to natural disasters across the four countries pose a severe challenge to the ECB's price stability mandate. This is because they make it increasingly difficult for the ECB to align inflation rates across countries. Given that the euro area constitutes a

6 Unfortunately, we cannot disentangle the inflation responses across different event types due to sample size limitations.

monetary union, the ECB can only define one uniform monetary policy strategy that should, in an ideal setting, satisfy the needs of all individual member countries. However, the disparities in the inflation responses across countries calls for individual policy measures, that largely differ across countries. This is even more true if the frequency and severity of severe weather events will increase, as climate change accelerates. To prevent these cross-country disparities from becoming even larger in the future requires a strong and unified answer from the ESCB to mitigate the negative consequences of climate change.

To summarise, the five key takeaways of our analysis for France, Germany, Italy and Spain are as follows:

1. effects on headline and core inflation are significant in all four countries;
2. there are large differences across countries;
3. while decreases in inflation rates prevail in Germany, we find ambiguous effects in France, Italy and Spain;
4. these cross-country differences will make it more difficult for the ECB to align inflation rates across countries;
5. this problem is exacerbated, if climate change further accelerates.

2.2.3 Global context and outlook

The empirical analysis has demonstrated how disasters threaten price stability in the euro area. However, the magnitude of the estimated effects is rather small. In this section, we set the estimates into a global context and discuss the implications of an acceleration in climate change for price stability.

For our sample of euro area countries and the period from 1996 to 2021, the EM-DAT disaster database contains 227 natural disasters, for which the estimated damage has been reported.[7] In this sample period, the average estimated damage per disaster was approximately US$ 822 million. On average, there have been nine events per year that also reported a monetary damage.

[7] For details on the data and the construction of our disaster variable, see Appendix A.1.

An average disaster year in 2020 would thus amount to around 0.057 % of GDP.[8]

If we take a global perspective using our dataset, we find for the 3,260 global disaster events that the average estimated damage per disaster has been at US$ 928 million for the period from 1996 to 2021. A global average disaster year amounts to US$ 117 billion. For the year 2020, the average disaster damage per event amounted to US$ 1.255 billion with total damages for all events in that year of US$ 173.133 billion. These make up 0.205% of worldwide GDP.[9] Therefore, damages are more than threefold the size of damages in the euro area.

We now analyse, for illustrative purposes, what would happen in the euro area inflation rate if the damages in the eurozone were of the same magnitude as the current damages at the global level. In reality, this is very likely to happen in the near future if the increase in global warming continues at the current pace. Using the econometric results from our benchmark specification (8) in Table 1, it turns out that the monthly headline inflation in the euro area would be affected by approximately 0.00615 percentage points in the first month only.[10] While this may look small, we need to have in mind that the average monthly inflation target of the ECB is only around 0.16 percent.

What is more, attention should be paid to price growth divergence between countries. For instance, according to our benchmark specification (8), a disaster at lag 9 yields coefficients of -0.03 and -0.04 in Germany and Italy, respectively (see Tables 6 and 7). This implies that monthly headline inflation decreases by 0.03 and 0.04 percentage points following climate disasters of one percentage point of monthly national GDP. In contrast, monthly headline inflation in Spain increases by 0.09 percentage points (see Table 8).

8 GDP in the euro area was at US$ 12,915.07 billion in 2020 according to the IMF World Economic Outlook Database.

9 According to the IMF World Economic Outlook Database, worldwide GDP amounted to US$ 84,537.692 billion in 2020.

10 We concentrate on the first significant coefficient for the sake of simplicity. There are further significant estimates, which imply further disruptions on the price level from disasters.

If we use these estimates and consider again the case in which natural disasters become as destructive in the euro area as they are nowadays in the world (i.e. they are equal to 0.205% of GDP), we find that monthly headline inflation would decrease by 0.00615 percentage points in Germany and by 0.0082 percentage points in Italy. In contrast, inflation would increase by 0.01845 percentage points in Spain. We thus find a difference in the inflation responses between Italy and Spain of 0.02665 percentage points. Again, these numbers may seem small at first glance. However, the cumulative inflation responses of all disasters that took place at lags 0 to 12 are certainly larger and will further increase, if climate change continues to accelerate.

Crucially, we also find large cross-country differences at the sub-index level. While food price inflation significantly rises in France following disasters (see Table 17), it declines in Spain (see Table 20). If we look at the inflation responses of bread and cereals in both countries (column 2 of Tables 17 and 20), we find that disasters in period t and t-1 of one percentage point of monthly GDP yield cumulative increases in inflation of bread and cereals of 0.09 percentage points in France. In contrast, monthly inflation declines by 0.27 percentage points in Spain. These estimates suggest that natural distastes of the same magnitude as those currently at the global level would cause increases in inflation rates of bread and cereals by 0.01845 percentage points in France, yet declines in inflation of 0.05535 percentage points in Spain. The difference in the inflation responses of both countries thus lies at 0.0738, which is a sizable effect.

It is important to bear in mind that all these estimates are potentially at the lower bound. Given the non-linear nature of climate change impacts and the importance of feedback loops and tipping points, any quantitative assessment of climate impacts on economic variables based on historical data will inevitably have limited explanatory power for future developments. However, it is foreseeable that an acceleration of global warming will increase both the number and intensity of climate-related disasters in Europe and elsewhere. For example, according to some estimates in the academic literature, the GDP losses in a 3 degrees global warming scenario could be between about 5% and 25% of GDP (see NGFS, 2021b).[11] Against this backdrop, it is conceivable that

11 Note that these estimates might be over-optimistic; see, for example, Keen (2020).

the effects of climate change on inflation will become larger over time. Only a strong, decisive and unified answer from the ESCB together with political decision-makers and other state bodies can decelerate, if not reverse, this development.

3 The ECB's role in addressing the climate crisis

"Climate change has a massive impact on the economy – for example, because of natural disasters – and thus, price stability. If we ignore this, we would not be fulfilling our mandate. In addition, the ECB's mandate is to support the EU's economic policy. In this, climate protection plays a crucial role."[12]

In July 2021, the ECB announced its decision to incorporate climate change considerations into its operations, responding to several calls that were made over the last years for the need of one of Europe's most powerful public institutions to take action against climate change. In supporting this decision, the ECB provided a three-fold rationale. First, it acknowledged that climate change can have an adverse effect on macroeconomic indicators (such as inflation, employment and productivity), financial stability and the transmission of monetary policy. Second, it highlighted the effects of climate change on the value and the risks of the financial assets on the balance sheet of the Eurosystem. Third, it recognised that the ECB should contribute to the fight against climate change, in line with its obligations that stem from the EU Treaties.

The first rationale is supported by our econometric analysis. As we showed in Section 2 of this report, climate damages have already affected inflation in the euro area and they will do so even more in the future. In addition to this, climate transition policies (like an increase in carbon prices) are likely to further amplify inflation volatility and affect the level of inflation. Since price stability is the primary objective of the ECB, the ECB has a responsibility to contribute to the fight against climate change and help prevent irreversible impacts on its ability to control inflation. Failure to do so would mean that the ECB does not take sufficient action to deliver on its primary mandate.

It is clear that the ECB (or any other central bank for that matter) by itself will not be able to halt climate change. It is also clear that governments must take

12 SPIEGEL interview with ECB Board member Isabel Schnabel, 9 April 2021, https://www.ecb.europa.eu/press/inter/date/2021/html/ecb.in210409~c8c348a12c.de.html

the leading role in setting the policy frameworks without which a net-zero transition cannot succeed. Governments need to step up and implement meaningful climate policies, using fiscal, industrial and other policy tools to mitigate climate change and help agents across the economy to adapt to the physical and transition impacts of climate change. But it is equally clear that climate change mitigation will not be successful if the financial system is not aligned with the climate goals. Central banks and financial supervisors therefore need to complement government policies and introduce explicit strategies to support the transition of the financial sector to net-zero (Robins et al., 2021).

The second rationale that the ECB used to support its recent decision – the importance of climate-related financial risks – has also been at the core of many calls for action. The ECB, along with national central banks and financial supervisors, has a pivotal role to play in safeguarding financial stability by ensuring that individual financial institutions and the financial system at large can withstand climate-related physical and transition risks. The transition to a low-carbon economy will involve a large-scale structural change in which industries, particularly those directly linked to fossil fuel production and consumption, will have to decline (Semieniuk et al., 2021). To meet its climate targets, the EU economy will have to undergo an unprecedented structural transformation – especially in the energy, transport and industrial sectors, which are responsible for almost 90 per cent of CO2 emissions – within the next five to 10 years to prevent further investments that lock in carbon (Robins et al., 2021). The resulting transition risks related to the stranding of carbon-intensive assets constitutes a new source of risk for financial stability that could delay the low-carbon transition (Monasterolo, 2020).

Moreover, climate change can also destabilise the financial system through the so-called physical risks. Climate-related events and the gradual increase in atmospheric temperature can affect asset prices and lead to higher default rates for households and companies, deteriorating the financial position of financial institutions (Dietz et al., 2016; Dafermos et al., 2018; Batten et al., 2020; Duprey et al., 2020). Alogoskoufis et al. (2021) have, for example, shown that the physical risks are likely to increase quite dramatically in Europe in the coming decades.

Although the ECB recognises these risks, it fails to explicitly recognise their double materiality (Dikau et al., 2021).[13] The ECB's rationale for climate action confines its attention to how much the financial system more broadly, and the Eurosystem more precisely, are exposed to climate-related risks. It does not pay sufficient attention to the fact that the ECB itself contributes to climate-related risks by not climate aligning its monetary policy and by failing to promote a climate-neutral financial system. Supporting an early and smooth transition to net-zero is the best way of protecting the EU economy and minimising the risks of instability for the financial system arising from the macrofinancial risks stemming from climate change (Robins et al., 2021). Such a support would also be in line with a macroprudential, system-based, approach to climate risks (see Dafermos, forthcoming).

The third rationale behind the ECB climate action plan – the need to ensure that the ECB policies and operations are coherent with the climate neutrality policies of the European Union – had been ignored for many years. As part of its secondary objective, the ECB has a responsibility to support the general economic policies of the EU. The Treaty on the Functioning of the European Union (TFEU) states that "without prejudice to the objective of price stability, the ESCB shall support the general economic policies in the Union with a view to contributing to the achievement of the objectives of the Union as laid down in Article 3 of the Treaty on European Union" (TFEU, Article 127 (1)). The referenced Article 3 specifies that the ESCB shall contribute to "the sustainable development of Europe based on [...] a high level of protection and improvement of the quality of the environment".[14] Thus, the ESCB's mandate includes, inter alia and without prejudice to the objective of price stability, supporting the EU's environmental objectives (Volz, 2017). As highlighted by Frank Elderson, a member of the ECB Executive Board: "This mandate, which is sometimes referred to as the ECB's 'secondary objective', stipulates a duty, not an option, for the ECB to provide its support" (Elderson, 2021). Isabel Schnabel, also a member of the ECB Executive Board, has affirmed that, "if faced with a choice

13 See also Oustry et al. (2020) and Oman and Svartzman (2021).

14 Article 11 of the TFEU specifies: "Environmental protection requirements must be integrated into the definition and implementation of the Union's policies and activities, in particular with a view to promoting sustainable development."

between two monetary policy measures that have the same impact on price stability, the ECB would have to choose the one that is more in line with EU policies" (Schnabel, 2021a).

Not only does the EU Treaty specify that environmental protection should be an integral part of the EU policies. Recently, climate neutrality has been explicitly incorporated into the EU policies and become the centrepiece of the European Green Deal. In 2018, the European Commission presented its vision for achieving net-zero greenhouse gas emissions in the EU by 2050. In March 2019, the European Parliament endorsed this objective. This vision was later reaffirmed in the European Green Deal, the Commission's action plan to make Europe the first climate-neutral continent by 2050, while ensuring a just and inclusive transition. This net-zero goal was affirmed by both the European Council and the European Parliament in its resolution on the European Green Deal in January 2020. In March 2020, the European Commission proposed the EU's first Climate Law Regulation to make this political commitment legally binding. The European Climate Law was formally adopted in July 2021, legally requiring the EU institutions – which include the ECB – and the member states to take necessary measures to meet the EU's climate objectives. Therefore, ECB measures that are not aligned with climate neutrality undermine the economic policies of the EU and prevent the ECB from delivering on its secondary mandate. A recent legal analysis stated that central banks in Europe, including the ECB, are exposed to potential litigation for failing to include climate criteria in their monetary policy decisions (Verheyen, 2021).

Overall, the implementation of climate-aligned monetary policy is a pre-requisite for the fulfilment of the ECB's primary and secondary mandates. This means that the ECB should implement any climate-aligned monetary policy measure that supports climate neutrality and does not undermine price stability in the short run (Schnabel, 2021b). Although the ECB has now explicitly recognised that, its action plan lacks the ambition and the timeline that is consistent with addressing the climate emergency. We now turn to explain why this is the case and make recommendations for the way forward.

4 Making the ESCB operations climate-aligned: how the ECB should implement and move beyond its Strategy Review

As part of its Strategy Review, in July 2021 the ECB announced a roadmap of climate-related actions until 2024. This roadmap includes the following main types of actions: (i) the incorporation of climate change into macroeconomic modelling, projections, scenario analysis and stress testing; (ii) the development of indicators for capturing climate risks and the carbon footprint of financial institutions; (iii) the incorporation of climate risks and disclosure requirements into the collateral framework and the corporate asset purchase programme; and (iv) the assessment of market neutrality as a benchmark for monetary policy design.

This set of actions is a very welcome step. However, the ECB plan lacks the level of ambition that is required given the climate emergency that we are facing. This lack of ambition is, first, reflected in the timeline of the actions: most of the interventions that have the potential to affect climate targets will not be introduced before late 2022 and their full implementation might not take place before 2025. Second, the action plan is too focused on disclosures and the protection of the Eurosystem balance sheet from climate risks. It does not include a clear set of interventions that would directly incentivise green investment and contribute to the reduction of polluting activities, in line with a precautionary approach to the systemic risks that arise from climate change.[15] The way that the action plan of the ECB will be implemented in practice is also very important. For example, the types of models and indicators that will be used to analyse climate risks and capture green activities will affect the extent to which the Eurosystem will contribute or not to climate neutrality.

In what follows we put forward a set of recommendations that are more consistent with the urgency of the climate crisis compared to the ECB action plan. We also outline how the ECB should address specific issues that are included in its action plan. Our recommendations refer to (i) monetary policy, (ii) prudential regulation and supervision, (iii) market neutrality, (iv) macroeconomic modelling and scenario analysis and (v) portfolio management.

15 For the merits of a precautionary approach to monetary and financial policy, see Chenet et al. (2021).

4.1 Monetary policy

Broadly speaking, the key types of ECB monetary policy operations that can become climate-aligned are (i) credit operations; (ii) the Eurosystem collateral framework and (iii) the asset purchase programmes (see NGFS, 2021a). Credit operations refer to liquidity-providing operations and include the ECB main refinancing operations and the longer-term refinancing operations. The Eurosystem collateral framework is the framework via which the ECB identifies which assets (and under which conditions) the euro area commercial banks can use as collateral in order to get access to central bank liquidity. Asset purchase programmes are programmes through which the ECB buys securities issued by non-financial and financial corporations, as well as by governments.

According to the ECB action plan, there are three main changes that are intended to be made to the Eurosystem collateral framework and the corporate sector purchase programme (CSPP). First, disclosure requirements will be introduced as an eligibility criterion or will be used as a factor that might affect haircuts in the collateral framework and the amount of purchases in the CSPP. These requirements will be in line with EU policies. Second, the valuation and risk analysis of the financial assets will be extended to include climate-related financial risks. Third, the ECB might accept as collateral, financial assets that are conducive to the low-carbon transition and might take into account the alignment of issuers with climate targets in the decisions about asset purchases in the CSPP.[16]

This action plan illustrates that ECB will not follow the approach of the Bank of England which has recently decided to directly green its Corporate Purchase Bond Scheme using as a sole criterion the climate performance of issuers (see Bank of England, 2021). Instead, the ECB's primary focus will be the measurement of climate-related financial risks and the use of disclosures – it seems that the climate performance of the issuers will act as a complementary criterion. This approach restricts the contribution of the ECB to the fight against climate change and suffers from several limitations. First, although disclosures are necessary, disclosing climate-related information will not by itself lead to climate-

16 The ECB will also disclose climate-related information about CSPP by the first quarter of 2023.

related action by non-financial firms. Second, a less favourable treatment of companies that are more exposed to climate-related transition risks will not necessarily "penalise" carbon-intensive companies that do not have credible transition plans. For instance, if the ECB uses scenarios in which carbon prices increase at a slow pace, polluting companies might not be considered to be too risky from a financial stability point of view, and, thus, their representation in the collateral framework and asset purchases will not decline. Specific polluting companies might also not be "penalised" even under scenarios of high carbon prices. This will be so if it is assessed that these companies have a strong financial position that allows them to address the financial challenges of a high cost of emissions.[17] Third, a less favourable treatment of companies that are more exposed to climate-related physical risks might exacerbate climate risks instead of reducing them. This might be so since these companies need to invest in climate adaptation: if their cost of borrowing goes up, they will be less able to finance this investment and this will make them more exposed to physical risks (see Dafermos, forthcoming).

Due to these limitations, the ECB needs to shift its emphasis from disclosures and climate risks to the direct incorporation of climate alignment criteria into the collateral framework and its asset purchase programme, along similar lines as the Bank of England. This would require the identification of which assets are conducive to climate neutrality and which are not. This would in turn require the use of both backward-looking and forward-looking metrics for identifying the climate performance of the issuers of these assets (Bank of England, 2021; Dafermos et al., 2021b). Backward-looking metrics can include, for example, the carbon intensity and energy efficiency of a company over the last years or how much its use of electricity has relied on renewables in the past. Forward-looking metrics have to do primarily with the decarbonisation plans of the companies and how credible these plans are. The design of climate-aligned monetary policy measures also needs to rely on the information about specific assets (e.g. if bonds are 'green' or 'sustainability-linked') and can consider the main activities of each company and how much they are in line with climate targets. For example, monetary policy operations can be designed in a way that creates

[17] See also Caldecott (2020) for the difference between climate risk management and the explicit targeting of climate-aligned outcomes.

more pressure on companies that engage in carbon-intensive activities that need to be deeply decarbonised for the transition to a low-carbon economy.

In identifying the climate footprint of assets, it is of particular importance for the ECB to minimise greenwashing problems. The risk of greenwashing might be higher if too much emphasis is placed on decarbonisation plans whose credibility might be difficult to be properly assessed. Greenwashing issues might also arise if backward-looking metrics fail to capture carbon-intensive aspects of the operations of companies (e.g. those related with scope 3 emissions). Importantly, the ECB can help with the minimisation of greenwashing problems by contributing to the establishment of standardised requirements for the disclosure of climate-related data by companies.

Once the climate footprint of financial assets has been identified, the monetary policy operations of the ECB need to be designed such that they provide more support to assets that are more conducive to climate neutrality and less support to assets that undermine the low-carbon transition. The development of a climate-aligned Eurosystem collateral framework requires two types of adjustments (see Dafermos et al., 2021b). The first is an adjustment in haircuts. A haircut refers to a reduction applied to a value of an asset when this asset is used as a collateral by a commercial bank to get access to central bank liquidity. The higher the haircut the lower the amount of central bank liquidity a commercial bank can get by using a specific asset as collateral. In a climate-aligned collateral framework the haircuts on securities linked with companies or projects that are conducive to a low-carbon transition need to decline. On the contrary, the haircuts of bonds that are characterised by a poor climate performance based on backward-looking and forward-looking indicators need to increase.

The second type of adjustment has to do with the assets that are eligible in the collateral framework. This involves both negative and positive screening. Negative screening refers to the exclusion of assets that are linked with a very poor climate performance (e.g. securities issued by coal companies). Positive screening involves the inclusion of climate-friendly assets in the collateral framework.

The recalibration of haircuts and eligibility can have important effects on the financial markets. It can increase the demand for climate-aligned securities and decrease the demand for securities that undermine the low-carbon transition.

This can in turn lead to a reduction in the cost of borrowing for climate-aligned activities and an increase in the cost of borrowing for carbon-intensive activities. Empirical evidence on the financial implications of the Eurosystem collateral framework has shown that eligibility and lower haircuts are linked with lower bond yields (e.g. Nguyen, 2020; Pelizzon et al., 2020).

The corporate QE programme of the ECB can become climate-aligned via a tilting in purchases and the use of negative and positive screening (Battiston and Monasterolo, 2019; Dafermos et al., 2020; Schoenmaker, 2021; Bank of England, 2021). Tilting refers to the rebalancing of purchases towards issuers that exhibit a better climate performance. Empirical evidence has shown that bonds that are eligible in the corporate QE programme enjoy lower yields (e.g. Todorov, 2020). Therefore, a climate recalibration of the ECB corporate QE programme can be conducive to a more climate-aligned yield profile in the bond markets. It can also give a powerful signal to the financial markets about the need to become consistent with climate neutrality.

Overall, the ECB needs to become more ambitious in the incorporation of climate criteria into the Eurosystem collateral framework and the CSPP. However, this would not be enough: the ECB also needs to climate align its other key programmes. These include (i) the Targeted Longer-Term Refinancing Operations (TLTROs), a key liquidity-provision programme of the ECB over the last years, and (ii) the Covered Bond Purchase Programme (CBPP) and the Asset-backed Securities Purchase Programme (ASPP) (see Batsaikhan, 2021). TLTROs can become climate-aligned through adjustments in the interest rates. For example, the interest rate for the lending facilities could be a function of the proportion of the low-carbon and high-carbon assets on the balance sheet of banks: the higher the proportion of low-carbon (high-carbon) assets the lower (higher) the interest rate.[18] The interest rate could also be conditional on the climate footprint of the assets that banks pledge as collateral in order to get access to central bank liquidity. In the CBPP and ABSPP the purchases of covered bonds and asset-backed securities could become a function of the climate footprint of the financial institutions that issue them. Given that the ECB is planning to derive indicators that will measure the climate footprint of the portfolios of financial

18 van't Klooster and van Tilburg (2020) have suggested that the interest rate in the Targeted Long-Term Refinancing Operations (TLTROs) be a function of the volume of EU Taxonomy-compliant loans on the balance sheet of banks.

institutions, these indicators could be the basis for introducing climate change considerations in the CBPP and the ABSPP.

One important point that should be made is that, in order to be consistent with its Treaty-related obligations, the ECB needs to ensure that the climate alignment of its monetary policy operations will not undermine its ability to achieve price stability in the short run. This has the following implications. First, the incorporation of climate-related criteria in the ECB QE programme should not lead to a decline in the size of the potential central bank asset purchases compared to what is the case when climate-related criteria are not considered. The same holds for the size of the eligible haircut-adjusted value of collateral in the Eurosystem collateral framework. Dafermos et al. (2020, 2021b) show that this is possible as long as the decline in the purchases and the haircut-adjusted collateral linked with carbon-intensive assets is counterbalanced by an increase in climate-friendly purchases and collateral. Second, in periods in which inflation is above the inflation target, the QE programmes and TLTROs might not continue if the ECB assesses that monetary policy contraction is necessary in order keep inflation under control. Therefore, in periods of monetary contraction, climate-aligned monetary policy interventions might need to be confined to the main refinancing operations and the collateral framework. However, the reduction in asset purchases and the size of liquidity-provision programmes ("tapering"), which characterises the transition from an expansionary monetary policy stance to a contractionary one, needs to be consistent with climate neutrality. In practice, this would mean that the companies and assets that comply less with the requirements of the Paris agreement targets should be the first to lose the ECB financial support.

4.2 Prudential supervision and regulation

A significant barrier to the climate alignment of the euro area financial system is the lack of common standards for climate-related financial disclosures. The recommendations of the Financial Stability Board's Task Force on Climate-related Financial Disclosures (TCFD) have the potential to address this issue (TCFD, 2017). However, the existing TCFD disclosures framework has two limitations. First, it gives too much flexibility to companies on how they can report

climate-related financial information. This does not allow a consistent comparison across companies. The development of specific metrics that will be required to be reported in a coherent manner by all financial institutions is a prerequisite for avoiding greenwashing (Dafermos et al., 2021a). Second, climate neutrality is not at the core of TCFD (Dikau et al., 2021). Although TCFD has recently paid attention to the use of forward-looking metrics for capturing the climate alignment of financial investments (see TCFD, 2020), there is still a lack of a well-designed common framework for assessing the climate performance of financial institutions.

The ESCB has a significant role to play in addressing these limitations and developing common standards for climate-related financial disclosures. These common standards need to be designed as a matter of priority and climate-related financial disclosures should become mandatory once these standards have been agreed. Moreover, the euro area central banks and financial supervisors need to ask financial institutions to publish net zero transition plans that will include specific information about climate-related targets and the actions that financial institutions intend to take to achieve these targets (Dikau et al., 2021). Crucially, the publication of such plans will improve the availability of forward-looking data that is crucial for the investment community and the design of climate-aligned monetary and financial policies.

Although the ECB climate-related roadmap includes some broad plans about climate-related supervision, such as climate stress testing and disclosure requirements, it is unclear if the ECB will require specific transition plans from financial institutions. If not, the contribution of climate-related supervision to climate neutrality is likely to be small. More broadly, it is important that the ECB does not confine its attention to reporting and disclosures. Capital requirements can be an additional powerful tool for promoting a climate-aligned financial system (D'Orazio and Popoyan, 2019; Finance Watch, 2020; Dafermos and Nikolaidi, 2021). For instance, euro area financial regulators can ask financial institutions to hold additional capital – on top of the existing capital buffers – against assets that are linked with activities that are considered to be too carbon-intensive. This would incentivise commercial banks to reduce lending which supports projects that undermine the path to climate neutrality. This would be consistent with a macroprudential approach to climate change: given that carbon-intensive lending is a source of systemic risk (since it reinforces

global warming that can lead to financial instability), carbon-related capital requirements can pro-actively contribute to the protection of the financial system from this source of risk (Dafermos, forthcoming).

4.3 Market neutrality

The assessment of market neutrality as a benchmark for monetary policy design is part of the ECB climate action plan. Although it is not directly referred to in the ECB's mandate, the principle of market neutrality has been at the heart of the design of ECB policies and reflects the idea that the ECB should not take measures that distort markets.[19] For example, in the design of its corporate quantitative easing programme, the ECB buys bonds such that the sectoral allocation of its purchases follow the sectoral allocation in the eligible bond universe. The 'market neutrality' principle has been one of the most influential conventions in ECB policymaking. The evaluation of the market neutrality principle has been included in the ECB action plan.

Those who oppose climate-aligned monetary policy measures often argue that these measures are not consistent with the market neutrality principle, since they might favour companies with lower carbon intensity compared to high-carbon ones, distorting markets. However, the argument that the ECB should not implement climate-aligned measures because these would violate the market neutrality principle are misplaced for at least two reasons. First, it is important to realise that monetary policy always has distributional consequences, and that the actions of central banks – whether intended or not – have historically played an important role in shaping markets (Volz, 2017). Several ECB interventions in the past have shaped financial markets and have had different effects on different segments of the economy (Braun, 2018; Senni and Monnin, 2020; van't Klooster and Fontan, 2020). For instance, the ECB programmes and collateral framework provided support to asset-backed securities in the aftermath of the Global Financial Crisis, favouring disproportionately the issuers of these securities (and the broader shadow banking system) that suffered from low private demand in the post-crisis period. Moreover, by having selected a specific mix of monetary policy tools and transmission channels the ECB has

19 See de Boer and van 't Klooster (2020), ClientEarth (2021) and Dikau et al. (2021).

unavoidably favoured differently the public sector, big corporations, and small and medium-sized enterprises. For example, the introduction of the Corporate Sector Purchase Programme in 2016 favoured companies with access to capital markets compared to companies that rely mostly on bank loans. Once market neutrality is understood within this broader context, it becomes clear that it is not possible for the ECB to remain market neutral in practice.

Second, it is now broadly recognised that markets have failed to reflect the implications of climate change. Nick Stern famously described climate change as the "greatest market failure that the world has seen" (Benjamin, 2007). Importantly, financial markets continue to fail to properly price climate risks, included stranded asset risk. The empirical evidence shows that the ECB's corporate asset purchase programme – which has been conducted in line with the market neutrality principle – have been heavily tilted towards carbon-intensive sectors (Matikainen et al., 2017; Dafermos et al., 2020). By adopting a market-neutral approach, the ECB is in consequence perpetuating existent market failures and the high-carbon bias in financial markets (Dikau et al., 2021).

Recently, numerous members of the ECB's Governing Council have effectively acknowledged that concepts other than market neutrality are needed (e.g. Sleijpen, 2021; Schnabel, 2021b). Against this backdrop, it is important for the ECB to abandon the market neutrality principle as soon as possible as part of its climate action plan.

4.4 Macroeconomic modelling and scenario analysis

The ECB's roadmap for climate-related actions includes the regular evaluation of the impact of climate fiscal policies on the Eurosystem/ECB staff macroeconomic projections and the conduct of scenario analysis about the macroeconomic and monetary policy implications of climate policies. So far, the ECB and the national central banks have placed emphasis on developing scenarios and preliminary modelling approaches that allow financial institutions to identify how exposed they are to transition and physical risks (e.g. Allen et al., 2020; de Guindos, 2021; NGFS, 2021b). Although these scenarios and modelling exercises are useful, one of their limitations is that they do not explicitly recognise the non-neutral role that the financial system plays in achieving the transition

to a low-carbon economy. In other words, they are not consistent with the concept of double materiality according to which financial institutions are not only affected by climate change due to transition and physical risks, but they can also affect themselves the path of emissions (see Battiston et al., 2021b; Dikau et al., 2021; Täger, 2021; Dafermos, forthcoming).

Going forward, the climate-related scenarios that will be used by financial supervisors in the euro area need to incorporate the feedback effects of the financial system on the macroeconomy and climate change. Scenarios that explicitly formulate these feedback effects will allow central banks and commercial banks to identify more clearly the role that they can play in the transition to a climate neutral economy. Importantly, the incorporation of the role of finance in scenario analysis might require the use of modelling tools that move beyond the standard tools used in macroeconomic and financial modelling which cannot easily incorporate feedback loops and network effects linked with the financial system and climate change (see Battiston et al., 2021a). The ESCB needs to play a leading role in developing scenarios that rely on such tools. This would facilitate the climate alignment of the euro area financial system.

4.5 Portfolio management

Apart from monetary policy portfolios, central banks manage other portfolios that primarily include their own assets and pension funds. It is crucial for the euro area central banks to manage these portfolios in a way that is conducive to ecological sustainability. By doing so they can 'lead by example' and create a benchmark that the financial markets can follow.

There are a range of options that the euro area central banks can use to climate align their portfolios (NGFS, 2019). These include positive and negative screening as well the tilting approaches that were discussed above in the case of monetary policy portfolios. On top of these approaches, central banks can exercise ownership rights and 'voice' with the aim of affecting the climate strategies of companies.

Several euro area central banks, like the De Nederlandsche Bank (DNB) and the Banque de France (BdF), have recently taken initiatives that aim to improve the sustainability profile of their portfolios (Dikau et al., 2021). The Eurosystem has also recently agreed on a common stance for climate-related and responsible

investment principles for non-monetary policy portfolios (ECB, 2021c). This common stance focuses on the identification of metrics that can capture the climate performance of these portfolios based on the TCFD recommendations. Although this is a useful step, there is a need for more rapid developments in this area – the current aim for ESCB central banks to make TCFD disclosures within the next two years in not consistent with the urgency of the climate crisis. More crucially, the plans for climate-aligned portfolios should become more ambitious and include negative screening strategies, which can put more pressure on polluting companies that do not have credible decarbonisation plans.

5 Conclusion

The ECB has taken an important step by announcing its new monetary strategy and climate action plan. In this report we underline how critical it is for the ECB to address the climate challenge to deliver on its primary mandate. We show for the first time that natural disasters have already had small but significant effects on headline and core inflation in the eurozone. With an escalation of the climate crisis, the frequency and intensity of climate-related hazards will increase in the eurozone. If past data shows that natural events have already an impact on inflation, this effect can only become stronger as global warming increases, with important ramifications for the ECB's policies and operations. Indeed, the ability of the ECB to control inflation may be significantly undermined if the world passes the 1.5 or 2 degrees threshold. Therefore, actions that prevent the increase in global warming have an important role to play in allowing the ECB to achieve its primary objective in the future.

While the ECB climate action plan is a critical first move in the right direction, it falls short of providing an ambitious agenda consistent with the climate emergency that we are facing. In this report, we have set out how the ECB could develop an ambitious agenda that would help it deliver on its primary and secondary mandates. Concretely, we recommend that, on top of the acceleration of their climate action plans, the ECB and the ECSB (i) introduce more explicitly climate performance criteria into their monetary policy tools; (ii) align prudential regulation with climate neutrality; (iii) abandon market neutrality as the key principle that guides the design of monetary policy; (iv) incorporate double materiality and macrofinancial feedback loops in macroeconomic modelling and scenario analysis; and (v) use more ambitious climate-related criteria in their portfolio management.

The ECB and the ECSB must be bold in their actions to safeguard macrofinancial stability across the eurozone in the face of climate change. As guardians of the financial system, the ECB and the ECSB need to send clear signals to the financial sector that a net-zero transition of the eurozone economy and the financial system is a key target of its policies, and that monetary and prudential frameworks will be adjusted accordingly.

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Appendix

A.1 Data and Methodology

For our analysis on the inflationary effects of natural disasters, we use monthly data for all euro area countries in the period from 1996 to 2021. For the disasters, we draw on the EM-DAT database from the Centre for Research on the Epidemiology of Disasters (CRED) at the Université Catholique de Louvain. This extensive database comprises detailed data on natural disasters, such as earthquakes, volcanic eruptions, storms, floods, droughts, heat and cold waves, which occurred worldwide since 1900 up to the present. It also contains information on the strength of the disaster, as well as on the number of people killed and affected and the estimated monetary damage. The data are compiled from various sources, e.g. UN agencies, non-governmental organisations, insurance companies, research institutes and press agencies.

Following the literature on the macroeconomic effects of natural disasters (Noy, 2009; Noy and Nualsri, 2011; Parker, 2018 and Fratzscher et al., 2020), we use the reported estimated damage as our disaster variable. This measure captures the direct damage to crops, property and livestock, measured in US dollars and valued at the moment of the event. The effects of the disasters on inflation depend on the size of the disaster, thus, to standardise across countries, we follow Fratzscher et al. (2020) and divide the estimated damage by the level of monthly current-price GDP in the affected country, 12 months prior to the event. In consequence, our disaster variable captures the estimated monetary damage of the event in percent of GDP.

To measure monthly inflation rates, we use data on headline inflation and its sub-indices for all euro area countries in the period from 1996 to 2021. Data are provided by Eurostat and capture the price changes of consumer goods and services acquired by euro area households. Unlike other consumer price data, they are based on harmonised statistical methods and thus allow for cross-country comparisons. Data are available for overall headline inflation, as well as for its 12 main sub-indices and further sub-categories. This allows us to disentangle differences in the direction and strength of price effects across consumption categories.

We add numerous control variables to our model to account for other driving forces of inflation rates. We extract monthly data on the gross domestic product (GDP, ratio to trend), industrial production (excluding construction) and the unemployment rate for all euro area countries as well as on the nominal exchange rate to US dollars from the OECD's *Main Economic Indicators* and *Key Short-Term Economic Indicators* databases. Data on industrial import prices are provided by Eurostat, brent crude oil prices are extracted from the *World Bank Commodity Price Data*.

For the estimation of the euro-area-wide effects of natural disasters on inflation rates, we use the following panel regression model:

$$\pi_{i,t} = \alpha + \sum_{j=0}^{12} \beta_j D_{i,t-j} + \sum_{l=1}^{12} \pi_{i,t-l} + \varphi X_{i,t-1} + \mu_i + \lambda_t + \varepsilon_{i,t} \quad (1)$$

where $\pi_{i,t}$ is the monthly headline inflation rate in country *i* and month *t*. $D_{i,t}$ is our disaster variable that captures the estimated monetary damage (in % of GDP) from natural disasters taking place in months *t-j* up to *t* in country *i*.

The coefficients of interest are the β_j's that measure by how much inflation rates change following an increase in climate disasters by one percentage point of monthly GDP. If several distinct events happen in country i within the same month, we follow Fratzscher et al. (2020) and sum over all disasters in that month. We include 12 lags of the disaster variable to account for time lags in the transmission of the disaster shock to inflation. Moreover, we include lags of the dependent variable to remove potential autocorrelation in the error term, as in Noy (2009) and Fratzscher et al. (2020).[20] We choose $L = 12$ to allow inflation of the past 12 months to impact the current inflation rate.

Furthermore, we add numerous control variables for country *i* in the vector $X_{i,t-1}$. These comprise GDP, industrial production, the unemployment rate as well as the monthly changes in the nominal exchange rate to US dollar as well

[20] The inclusion of lagged dependent variables as regressors causes problems associated with the Nickell bias (Nickell, 1981). Yet, in our setting where the number of countries *N* is small (it equals 19) and *T* is larger than 30, this bias is expected to be negligible (Judson and Owen, 1999).

as in import and oil prices. They are included with a lag of one month to prevent endogenous feedback with the disaster variable (see Fratzscher et al., 2020).

In line with the literature (Parker, 2018; Heinen et al., 2019; Fratzscher et al., 2020), we include fixed effects for country *i*, μ_i, and for month *t*, λ_t. These capture country- and month-specific factors that cause inflation rates to differ across countries and time, respectively. To account for a potential correlation between the regressors and the country-specific time-invariant factors μ_i, we follow Noy (2009) and Heinen et al. (2019) and employ a fixed effects estimation. To control for cross-sectional and serial correlation (of up to five lags) in the idiosyncratic error term $\varepsilon_{i,t}$, we use Driscoll and Kraay (1998) adjusted standard errors, as in Parker (2018) and Heinen et al. (2019).[21]

For our analysis on the inflationary effects of natural disasters in France, Germany, Italy and Spain, we perform an Ordinary Least Squares (OLS) estimation on the following regression model:

$$\pi_t = \alpha + \sum_{j=0}^{12} \beta_j D_{t-j} + \sum_{l=1}^{12} \pi_{t-l} + \varphi X_{t-1} + \varepsilon_t \qquad (2)$$

The included variables exactly match the ones from above for the respective country, except that we exclude the country and time fixed-effects for our country-by-country regressions. We use Newey-West adjusted standard errors that are robust to heteroskedasticity and first-order autocorrelation. We test for the stationarity of the variables by performing Augmented Dickey-Fuller (ADF) tests that reject the null hypothesis of a unit root for all variables, except for some of the control variables.[22]

21 To test whether the residuals are cross-sectionally dependent, we use Pesaran's test, as suggested by Hoechle (2007). The null hypothesis of cross-sectional independence is rejected for headline inflation, as well as for all of the main 12 sub-indices, for any standard significance level.

22 Specifically, the null hypothesis of a unit root cannot be rejected for the unemployment rate in all four countries as well as for the logs of GDP and industrial production in Germany and Spain. However, visual inspection of these time series suggests that the non-stationarity of the ADF tests results from a structural break due to the COVID-19 pandemic in 2020 and 2021 rather than from a unit root.

A.2 Tables

Table 1: Determinants of headline inflation, euro area, 1996-2021

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Disaster, t	0.00	0.01	0.00	0.01	0.01	0.00	0.01	0.01
	(0.19)	(0.88)	(0.38)	(0.91)	(0.78)	(0.38)	(0.90)	(0.76)
Disaster, t-1	0.02**	0.03**	0.03**	0.03**	0.03**	0.03**	0.03**	0.03**
	(2.03)	(2.10)	(2.03)	(2.07)	(2.02)	(2.03)	(2.07)	(2.02)
Disaster, t-2	0.01	0.00	-0.00	0.00	-0.00	-0.00	0.00	-0.00
	(1.14)	(0.00)	(-0.15)	(0.02)	(-0.07)	(-0.15)	(0.02)	(-0.07)
Disaster, t-3	0.02***	0.01	0.01	0.01	0.01	0.01	0.01	0.01
	(2.73)	(0.58)	(0.53)	(0.59)	(0.56)	(0.52)	(0.57)	(0.54)
Disaster, t-4	-0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
	(-1.10)	(0.42)	(0.38)	(0.44)	(0.41)	(0.39)	(0.46)	(0.43)
Disaster, t-5	0.01	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02
	(0.82)	(-1.30)	(-1.26)	(-1.27)	(-1.32)	(-1.25)	(-1.25)	(-1.30)
Disaster, t-6	0.02***	0.01**	0.01*	0.01*	0.01*	0.01*	0.01	0.01
	(3.64)	(2.00)	(1.88)	(1.72)	(1.75)	(1.71)	(1.55)	(1.55)
Disaster, t-7	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00
	(-0.11)	(-0.41)	(-0.61)	(-0.60)	(-0.70)	(-0.63)	(-0.64)	(-0.74)
Disaster, t-8	0.02*	0.01***	0.01***	0.01**	0.01**	0.01***	0.01**	0.01**
	(1.90)	(2.66)	(2.82)	(2.43)	(2.37)	(2.75)	(2.30)	(2.23)
Disaster, t-9	-0.00	-0.02	-0.02*	-0.02	-0.02	-0.02	-0.02	-0.02
	(-0.46)	(-1.57)	(-1.66)	(-1.56)	(-1.63)	(-1.65)	(-1.56)	(-1.63)
Disaster, t-10	0.01	-0.00	-0.00	-0.01	-0.01	-0.00	-0.01	-0.01
	(1.45)	(-0.82)	(-0.70)	(-1.09)	(-1.16)	(-0.69)	(-1.08)	(-1.15)
Disaster, t-11	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
	(1.11)	(1.14)	(1.08)	(1.08)	(1.00)	(0.84)	(1.05)	(1.01)
Disaster, t-12	0.01	-0.01***	-0.01***	-0.01***	-0.01***	-0.02	-0.02*	-0.02**
	(1.30)	(-2.82)	(-2.74)	(-3.02)	(-3.09)	(-1.47)	(-1.96)	(-2.03)
Dep. var., t-1 to t-12	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country & Month FE	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Change in Import Prices, t-1		1.15	0.89	1.01	1.01	0.88	0.91	0.91
		(1.16)	(0.65)	(1.04)	(1.06)	(0.64)	(0.92)	(0.92)
GDP (Ratio to Trend), t-1			1.16			1.16		
			(1.39)			(1.39)		
Industrial Production, t-1				0.19*			0.19*	
				(1.87)			(1.86)	
Unemployment, t-1					-0.01***			-0.01***
					(-4.27)			(-4.27)
Change in Nom. Exch. Rate (USD), t-1						2.63	4.26	4.40
						(0.41)	(0.80)	(0.83)
Change in Oil Prices, t-1						0.99***	0.32***	0.89***
						(14.50)	(3.00)	(14.16)
Observations	5508	2400	2168	2400	2398	2168	2400	2398
Countries	19	12	10	12	12	10	12	12
Degrees of freedom	25	315	316	316	316	317	317	317
R2 within	0.62	0.82	0.84	0.83	0.83	0.84	0.83	0.83

t statistics in parentheses
$^{*}\ p < 0.1,\ ^{**}\ p < 0.05,\ ^{***}\ p < 0.01$

Table 2: Determinants of core inflation, euro area, 1996-2021

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Disaster, t	-0.01	-0.00	-0.01	-0.00	-0.01	-0.01	-0.00	-0.01
	(-0.81)	(-0.41)	(-0.60)	(-0.45)	(-0.69)	(-0.63)	(-0.46)	(-0.70)
Disaster, t-1	-0.01	0.02**	0.02*	0.02*	0.02*	0.02*	0.02*	0.02*
	(-0.98)	(2.06)	(1.85)	(1.97)	(1.70)	(1.86)	(1.97)	(1.70)
Disaster, t-2	0.00	0.02*	0.02	0.02*	0.02	0.02	0.02*	0.02
	(0.32)	(1.80)	(1.63)	(1.87)	(1.64)	(1.61)	(1.87)	(1.64)
Disaster, t-3	0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
	(0.92)	(-0.45)	(-0.57)	(-0.40)	(-0.55)	(-0.60)	(-0.43)	(-0.58)
Disaster, t-4	-0.01	-0.00	-0.00	-0.00	-0.00	-0.00	0.00	-0.00
	(-0.71)	(-0.04)	(-0.13)	(-0.00)	(-0.17)	(-0.08)	(0.03)	(-0.13)
Disaster, t-5	-0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00
	(-0.47)	(0.21)	(0.19)	(0.25)	(0.09)	(0.23)	(0.28)	(0.12)
Disaster, t-6	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
	(1.25)	(1.19)	(1.16)	(0.98)	(0.94)	(0.91)	(0.85)	(0.80)
Disaster, t-7	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
	(0.48)	(0.49)	(0.41)	(0.30)	(0.22)	(0.37)	(0.28)	(0.19)
Disaster, t-8	0.02**	0.03***	0.03***	0.03***	0.03***	0.03***	0.03***	0.03***
	(2.26)	(4.00)	(3.86)	(4.35)	(4.16)	(3.73)	(4.30)	(4.10)
Disaster, t-9	-0.01**	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
	(-1.98)	(-1.09)	(-1.13)	(-1.08)	(-1.19)	(-1.14)	(-1.09)	(-1.19)
Disaster, t-10	0.01	-0.00	0.00	-0.00	-0.00	0.00	-0.00	-0.00
	(0.79)	(-0.05)	(0.02)	(-0.25)	(-0.37)	(0.14)	(-0.21)	(-0.33)
Disaster, t-11	0.02***	0.02***	0.02***	0.02***	0.02***	0.04**	0.03**	0.03**
	(3.14)	(3.09)	(2.94)	(3.04)	(3.05)	(2.19)	(2.52)	(2.48)
Disaster, t-12	0.01	0.01	0.01	0.01	0.01	-0.00	0.00	0.00
	(1.09)	(1.15)	(1.23)	(1.14)	(1.09)	(-0.07)	(0.31)	(0.27)
Dep. var., t-1 to t-12	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country & Month FE	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Change in Import Prices, t-1		1.73*	1.15	1.46	1.48	1.15	1.30	1.31
		(1.66)	(0.75)	(1.41)	(1.49)	(0.76)	(1.26)	(1.32)
GDP (Ratio to Trend), t-1			1.18			1.20		
			(1.19)			(1.20)		
Industrial Production, t-1				0.34***			0.34***	
				(3.28)			(3.26)	
Unemployment, t-1					-0.02***			-0.02***
					(-5.77)			(-5.78)
Change in Nom. Exch. Rate (USD), t-1						12.72	7.27	7.54
						(1.64)	(1.31)	(1.37)
Change in Oil Prices, t-1						-0.42***	-0.43***	-0.48***
						(-4.55)	(-5.10)	(-5.73)
Observations	4936	2339	2110	2339	2337	2110	2339	2337
Countries	19	12	10	12	12	10	12	12
Degrees of freedom	25	315	316	316	316	317	317	317
R2 within	0.83	0.90	0.90	0.90	0.90	0.90	0.90	0.90

t statistics in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 3: Determinants of sub-indices' inflation, euro area, 1996-2021

	FoodBev	AlcTob	ClothShoes	HoElG	HoEq	Health	Transp	Comm	RecrCult	Educ	RestHot	Misc
Disaster, t	0.11**	-0.03*	-0.13	-0.00	-0.03**	0.03	-0.02	0.02	0.01	0.01	-0.00	-0.00
	(2.34)	(-1.95)	(-1.54)	(-0.02)	(-2.36)	(1.33)	(-0.36)	(0.82)	(0.47)	(0.32)	(-0.06)	(-0.29)
Disaster, t-1	0.06*	0.01	0.14**	-0.01	0.03	-0.02	0.01	-0.03	0.04	-0.01	0.00	0.00
	(1.68)	(0.27)	(2.09)	(-0.35)	(1.36)	(-0.96)	(0.54)	(-0.48)	(1.18)	(-0.20)	(0.15)	(0.12)
Disaster, t-2	-0.02	-0.02	0.13	0.01	0.00	-0.02	-0.01	0.03	-0.04	-0.03	0.04	0.01
	(-0.63)	(-0.42)	(1.05)	(0.17)	(0.21)	(-0.60)	(-0.49)	(0.89)	(-1.40)	(-0.88)	(1.00)	(0.71)
Disaster, t-3	0.04	0.02	0.01	0.10	0.00	-0.04	-0.03	0.07**	-0.01	-0.11	0.01	0.01
	(1.11)	(0.44)	(0.09)	(1.47)	(0.21)	(-1.28)	(-0.97)	(2.56)	(-0.33)	(-1.40)	(0.29)	(0.52)
Disaster, t-4	0.01	-0.04	-0.06	0.04	0.01	-0.05*	-0.00	-0.02	0.01	0.02	0.08	-0.00
	(0.25)	(-1.33)	(-0.56)	(0.94)	(0.43)	(-1.84)	(-0.05)	(-0.25)	(0.19)	(0.53)	(1.50)	(-0.03)
Disaster, t-5	-0.02	0.01	0.03	-0.10	-0.03**	-0.01	-0.05**	-0.01	0.00	-0.07	-0.01	-0.01*
	(-0.84)	(0.19)	(0.46)	(-1.42)	(-2.04)	(-0.44)	(-2.23)	(-0.15)	(0.02)	(-0.94)	(-0.28)	(-1.73)
Disaster, t-6	0.03*	0.00	0.01	0.03	0.01	0.02	0.01	0.04*	0.00	0.00	-0.01	0.01
	(1.87)	(0.08)	(0.42)	(1.45)	(0.75)	(0.80)	(1.05)	(1.80)	(0.12)	(0.16)	(-0.41)	(0.67)
Disaster, t-7	0.01	-0.00	-0.00	-0.02	0.02**	0.00	0.03	0.02	-0.01	0.01	-0.02	0.02***
	(0.46)	(-0.15)	(-0.06)	(-1.33)	(2.50)	(0.06)	(1.53)	(1.12)	(-0.57)	(0.62)	(-1.01)	(2.75)
Disaster, t-8	-0.01	-0.00	0.01	0.00	0.01	0.02	0.02	0.01	0.01	-0.01	0.11***	0.00
	(-0.58)	(-0.07)	(0.32)	(0.13)	(1.11)	(1.45)	(1.55)	(0.68)	(0.64)	(-0.78)	(3.46)	(0.19)
Disaster, t-9	-0.06**	-0.02*	-0.02	0.01	0.02**	0.00	0.02	-0.03	0.00	-0.02	-0.03	-0.00
	(-2.50)	(-1.76)	(-0.58)	(0.84)	(2.01)	(0.35)	(1.17)	(-0.79)	(0.01)	(-1.36)	(-1.20)	(-0.17)
Disaster, t-10	-0.00	-0.04	-0.01	-0.03**	-0.00	0.02	0.01	-0.01	-0.01	0.01	-0.02	0.00
	(-0.21)	(-1.61)	(-0.38)	(-2.48)	(-0.14)	(0.62)	(0.72)	(-0.85)	(-0.80)	(1.58)	(-1.19)	(0.23)
Disaster, t-11	-0.02	-0.01	0.08*	-0.02	0.02*	-0.04	-0.01	0.03	0.04*	0.04*	0.00	0.00
	(-0.57)	(-0.62)	(1.93)	(-0.56)	(1.73)	(-1.26)	(-0.45)	(0.85)	(1.83)	(1.66)	(0.02)	(0.23)
Disaster, t-12	-0.03	-0.01	-0.04	-0.02	0.01	0.04*	0.04**	-0.03	-0.05	-0.03	0.02	0.00
	(-1.46)	(-0.89)	(-0.93)	(-0.75)	(0.77)	(1.67)	(2.26)	(-1.05)	(-1.63)	(-1.40)	(0.87)	(0.19)
Dep. var., t-1 to t-12	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country & Month FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Change in Import Prices, t-1	-1.01	-0.72	5.09	-1.60	1.37	-2.67*	1.83	4.14	0.94	2.70	1.86	0.45
	(-0.39)	(-0.30)	(1.27)	(-0.65)	(0.68)	(-1.70)	(0.78)	(1.49)	(0.40)	(0.50)	(0.73)	(0.30)
Unemployment, t-1	-0.01	-0.01	-0.11***	-0.01*	-0.02***	-0.01	-0.01	-0.00	-0.04***	-0.00	-0.03***	-0.02***
	(-1.13)	(-1.51)	(-5.22)	(-1.71)	(-4.55)	(-1.28)	(-1.38)	(-0.33)	(-5.44)	(-0.42)	(-4.05)	(-5.00)
Change in Nom. Exch. Rate (USD), t-1	-15.30	5.15	21.93	10.84	4.87	-15.72	5.24	6.16	25.55**	32.01**	-10.78	2.68
	(-1.50)	(0.55)	(1.14)	(0.84)	(0.76)	(-1.64)	(0.52)	(0.37)	(2.08)	(2.16)	(-1.02)	(0.45)
Change in Oil Prices, t-1	2.13***	-0.23	5.33***	0.26	0.40***	-1.11***	-0.07	0.97**	0.14	4.23***	-0.28*	0.90***
	(7.91)	(-1.60)	(9.23)	(1.52)	(2.86)	(-10.84)	(-0.24)	(2.16)	(0.69)	(20.19)	(-1.66)	(10.06)
Observations	2389	2389	2389	2389	2389	2389	2389	2389	2389	2389	2389	2389
Countries	12	12	12	12	12	12	12	12	12	12	12	12
Degrees of freedom	316	316	316	316	316	316	316	316	316	316	316	316
R2 within	0.51	0.19	0.97	0.30	0.83	0.24	0.67	0.17	0.75	0.25	0.71	0.45

t statistics in parentheses
$^{*}\ p < 0.1,\ ^{**}\ p < 0.05,\ ^{***}\ p < 0.01$

FoodBev: food and non-alcoholic beverages; *AlcTob*: alcoholic beverages, tobacco and narcotics; *ClothShoes*: clothing and footwear; *HoEIG*: housing, water, electricity, gas and other fuels; *HoEq*: furnishings, household equipment and routine household maintenance; *Health*: health; *Transp*: transport; *Comm*: communications; *RecrCult*: recreation and culture; *Educ*: education; *RestHot*: restaurants and hotels; *Misc*: miscellaneous goods and services.

Table 4: Determinants of inflation of food and beverages' sub-categories, euro area, 1996-2021

	Food	BreadCer	Meat	FishSeaf	MilkChEg	OilsFa	Fruit	Veg	SugJHChC	Fonec	NAlcBev	CofTC	MWSJu
Disaster, t	0.12**	0.20	-0.03	0.05	0.03	-0.07	0.34**	0.42**	-0.01	0.00	0.05*	-0.04	0.09**
	(2.35)	(1.26)	(-1.33)	(1.64)	(0.96)	(-0.92)	(2.57)	(2.32)	(-0.45)	(0.18)	(1.94)	(-0.65)	(2.08)
Disaster, t-1	0.06	-0.01	0.02	-0.01	0.14	0.14	0.09	0.14	0.01	-0.01	0.00	-0.04	0.04
	(1.56)	(-0.61)	(0.47)	(-0.38)	(1.63)	(1.40)	(0.84)	(0.82)	(0.55)	(-0.25)	(0.04)	(-0.88)	(1.33)
Disaster, t-2	-0.03	0.01	0.03	-0.06	-0.10	0.08***	-0.07	-0.06	0.05	0.02	-0.00	0.02	-0.00
	(-0.71)	(0.33)	(1.31)	(-1.00)	(-1.27)	(3.15)	(-0.49)	(-0.23)	(1.63)	(0.49)	(-0.02)	(0.49)	(-0.15)
Disaster, t-3	0.04	0.02	0.03	-0.04	-0.01	0.14	0.21	0.05	-0.01	0.04*	0.04	0.07**	0.02
	(1.02)	(0.55)	(1.19)	(-0.55)	(-0.37)	(1.11)	(0.85)	(0.25)	(-0.42)	(1.76)	(1.37)	(2.37)	(0.50)
Disaster, t-4	0.01	-0.04	-0.05	-0.01	0.14	0.07	0.23	-0.01	0.04	0.05	0.01	0.02	0.02
	(0.24)	(-0.69)	(-1.54)	(-0.21)	(1.43)	(1.22)	(1.47)	(-0.05)	(1.34)	(1.60)	(0.60)	(0.90)	(0.77)
Disaster, t-5	-0.02	0.06	-0.03	-0.02	-0.07	0.06	-0.25*	0.09	-0.04	0.01	-0.02	-0.03	-0.03
	(-0.66)	(1.55)	(-1.00)	(-0.25)	(-1.10)	(0.75)	(-1.89)	(0.53)	(-1.32)	(0.52)	(-0.86)	(-0.83)	(-0.92)
Disaster, t-6	0.02	0.00	-0.03***	-0.00	0.01	0.01	0.22***	0.10	0.00	-0.01	0.05***	-0.01	0.08***
	(1.60)	(0.31)	(-4.32)	(-0.28)	(0.84)	(0.31)	(3.97)	(0.90)	(0.10)	(-0.87)	(4.16)	(-0.57)	(4.09)
Disaster, t-7	0.00	0.00	0.01	-0.00	0.03*	-0.04	-0.10*	0.07	0.03***	0.02	0.02*	-0.00	0.04***
	(0.32)	(0.33)	(0.93)	(-0.15)	(1.93)	(-1.01)	(-1.69)	(0.42)	(2.73)	(1.41)	(1.65)	(-0.13)	(2.89)
Disaster, t-8	-0.01	0.02	-0.02*	0.01	-0.01	0.01	0.05	0.07	-0.01	0.01	-0.02**	-0.04*	-0.02
	(-0.35)	(0.79)	(-1.95)	(0.21)	(-0.89)	(0.59)	(0.60)	(0.56)	(-0.74)	(0.39)	(-2.25)	(-1.92)	(-1.10)
Disaster, t-9	-0.06**	0.01	0.00	-0.04**	0.02	0.00	-0.20	-0.28***	0.02**	0.01	-0.02	0.03	-0.04**
	(-2.35)	(0.84)	(0.14)	(-2.07)	(0.88)	(0.11)	(-1.33)	(-3.24)	(2.16)	(0.76)	(-1.07)	(0.83)	(-2.02)
Disaster, t-10	-0.00	-0.01	-0.02*	0.01	0.01	-0.09***	-0.03	0.21**	0.01*	0.01	0.00	0.01	-0.01
	(-0.31)	(-1.18)	(-1.78)	(0.76)	(1.39)	(-2.87)	(-0.41)	(2.08)	(1.94)	(0.82)	(0.21)	(0.92)	(-0.58)
Disaster, t-11	-0.02	-0.01	-0.02	0.05*	-0.01	-0.03	-0.07	-0.20	0.00	0.02	0.03	0.03	0.03
	(-0.69)	(-0.35)	(-0.76)	(1.68)	(-0.57)	(-1.08)	(-0.58)	(-1.50)	(0.14)	(1.29)	(1.05)	(0.54)	(1.19)
Disaster, t-12	-0.03	-0.01	-0.02	0.02	0.03	-0.01	-0.18	-0.09	-0.00	-0.00	0.03	0.04	0.04*
	(-1.43)	(-0.82)	(-1.15)	(0.57)	(1.36)	(-0.43)	(-1.47)	(-0.73)	(-0.06)	(-0.09)	(1.50)	(0.78)	(1.82)
Dep. var., t-1 to t-12	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country & Month FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Change in Import Prices, t-1	-0.78	2.94	-0.77	6.85*	-0.13	-3.19	-6.80	-9.37	3.11	2.31	-1.73	-1.07	-1.97
	(-0.28)	(1.00)	(-0.32)	(1.74)	(-0.03)	(-0.58)	(-0.63)	(-0.53)	(0.88)	(1.38)	(-0.68)	(-0.17)	(-0.59)
Unemployment, t-1	-0.01	-0.02**	-0.01**	-0.01	-0.00	0.01	-0.02	0.00	-0.01	-0.01	-0.00	0.01	-0.02***
	(-1.18)	(-2.27)	(-2.25)	(-1.64)	(-0.33)	(0.61)	(-0.60)	(0.03)	(-1.23)	(-1.30)	(-0.19)	(0.89)	(-2.70)
Change in Nom. Exch. Rate (USD), t-1	-16.85	-5.46	3.39	-12.57	-8.56	-2.32	11.58	-167.19**	1.70	10.34	-3.61	9.50	-11.16
	(-1.50)	(-0.63)	(0.34)	(-0.91)	(-0.84)	(-0.17)	(0.24)	(-2.11)	(0.18)	(1.33)	(-0.22)	(0.32)	(-0.72)
Change in Oil Prices, t-1	1.58***	-0.34***	-0.36***	-3.98***	0.41***	0.01	-6.30***	17.13***	1.41***	0.66***	5.09***	4.26***	2.54***
	(5.28)	(-3.87)	(-2.69)	(-11.29)	(6.27)	(0.02)	(-4.87)	(16.03)	(12.54)	(8.79)	(12.40)	(3.60)	(10.62)
Observations	2389	2389	2389	2389	2389	2389	2389	2389	2389	2389	2389	2389	2389
Countries	12	12	12	12	12	12	12	12	12	12	12	12	12
Degrees of freedom	316	316	316	316	316	316	316	316	316	316	316	316	316
R2 within	0.51	0.28	0.28	0.32	0.32	0.24	0.63	0.62	0.24	0.27	0.31	0.32	0.31

t statistics in parentheses
$^{*}\ p < 0.1,\ ^{**}\ p < 0.05,\ ^{***}\ p < 0.01$

Food: food; *BreadCer*: bread and cereals; *Meat*: meat; *FishSeaf*: fish and seafood; *MilkChEg*: milk, cheese and eggs; *OilsFa*: oils and fats; *Fruit*: fruit; *Veg*: vegetables; *SugJHChC*: sugar, jam, honey, chocolate and confectionery; *Fonec*: Food products n.e.c.; *NAlcBev*: Non-alcoholic beverages; CofTC: coffee, tea and cocoa; *MWSJu*: Mineral waters, soft drinks, fruit and vegetable juices.

Table 5: Determinants of headline inflation, France, 1996-2021

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Disaster, t	0.05***	0.05***	0.05***	0.05***	0.06***	0.03***	0.03**	0.04***
	(5.48)	(5.15)	(5.12)	(4.21)	(5.42)	(2.84)	(2.31)	(3.14)
Disaster, t-1	0.05**	0.04**	0.04**	0.04**	0.05***	0.03*	0.03*	0.04**
	(2.55)	(2.23)	(2.13)	(1.97)	(2.65)	(1.81)	(1.68)	(2.25)
Disaster, t-2	-0.01	-0.01	-0.01	-0.02	-0.01	-0.01	-0.01	0.00
	(-0.59)	(-0.93)	(-0.91)	(-0.86)	(-0.61)	(-0.29)	(-0.29)	(0.06)
Disaster, t-3	0.04***	0.04***	0.04***	0.04***	0.04***	0.03***	0.03***	0.03***
	(5.47)	(5.04)	(5.00)	(5.07)	(5.58)	(3.45)	(3.33)	(4.05)
Disaster, t-4	-0.04***	-0.04***	-0.04***	-0.04***	-0.04***	-0.04***	-0.04***	-0.03***
	(-4.07)	(-4.12)	(-4.21)	(-4.60)	(-3.72)	(-3.75)	(-3.92)	(-3.31)
Disaster, t-5	0.03*	0.03*	0.03*	0.02	0.03*	0.05**	0.04**	0.05***
	(1.88)	(1.69)	(1.67)	(1.51)	(1.88)	(2.50)	(2.50)	(2.74)
Disaster, t-6	0.02	0.02	0.01	0.01	0.02	-0.02	-0.02	-0.01
	(1.61)	(1.12)	(1.13)	(0.95)	(1.33)	(-1.24)	(-1.37)	(-1.11)
Disaster, t-7	-0.00	-0.00	-0.00	-0.00	0.00	-0.01	-0.01	-0.00
	(-0.09)	(-0.23)	(-0.26)	(-0.42)	(0.01)	(-0.52)	(-0.59)	(-0.22)
Disaster, t-8	0.04	0.04	0.04	0.03	0.04	0.03*	0.03	0.03*
	(1.44)	(1.41)	(1.36)	(1.25)	(1.54)	(1.65)	(1.50)	(1.90)
Disaster, t-9	0.06***	0.06***	0.06***	0.06***	0.06***	0.05***	0.05***	0.05***
	(3.72)	(3.73)	(3.63)	(3.67)	(4.00)	(2.82)	(2.87)	(3.10)
Disaster, t-10	-0.01	-0.01	-0.01	-0.01	-0.00	-0.02	-0.02	-0.02
	(-0.35)	(-0.41)	(-0.43)	(-0.38)	(-0.23)	(-1.21)	(-1.15)	(-1.08)
Disaster, t-11	0.01	0.01	0.01	0.00	0.01	0.01	0.01	0.01
	(0.50)	(0.35)	(0.34)	(0.22)	(0.47)	(0.61)	(0.51)	(0.73)
Disaster, t-12	-0.04**	-0.05***	-0.05**	-0.05***	-0.04**	-0.06***	-0.06***	-0.05***
	(-2.41)	(-2.61)	(-2.57)	(-2.72)	(-2.47)	(-3.88)	(-3.85)	(-3.61)
Dep. var., t-1 to t-12	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Change in Import Prices, t-1		3.28	3.25	3.00	3.43	5.11	4.68	4.92
		(0.72)	(0.72)	(0.69)	(0.76)	(1.13)	(1.08)	(1.11)
GDP (Ratio to Trend), t-1			0.55			0.22		
			(1.05)			(0.31)		
Industrial Production, t-1				0.81**			0.55	
				(2.55)			(1.34)	
Unemployment, t-1					-0.04*			-0.04**
					(-1.67)			(-2.03)
Change in Nom. Exch. Rate (USD), t-1						0.30	0.44	0.62
						(0.39)	(0.56)	(0.76)
Change in Oil Prices, t-1						1.05***	1.01***	1.07***
						(4.72)	(4.35)	(5.10)
Observations	290	265	265	265	265	265	265	265
Degrees of freedom	25	26	27	27	27	29	29	29

t statistics in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 6: Determinants of headline inflation, Germany, 1996-2021

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Disaster, t	0.02	0.02	0.01	0.02	0.02	0.01	0.02	0.02
	(0.70)	(0.80)	(0.59)	(0.92)	(0.78)	(0.54)	(0.88)	(0.74)
Disaster, t-1	0.03	0.03	0.03	0.04	0.03	0.03	0.03	0.03
	(0.82)	(0.82)	(0.73)	(0.89)	(0.78)	(0.62)	(0.77)	(0.68)
Disaster, t-2	-0.01	-0.01	-0.01	-0.01	-0.01	-0.02	-0.02	-0.02
	(-0.52)	(-0.54)	(-0.52)	(-0.50)	(-0.54)	(-0.93)	(-0.98)	(-0.98)
Disaster, t-3	-0.07***	-0.07***	-0.07***	-0.06***	-0.07***	-0.07***	-0.06***	-0.07***
	(-4.10)	(-4.05)	(-4.09)	(-3.87)	(-4.06)	(-3.87)	(-3.62)	(-3.80)
Disaster, t-4	0.03	0.03	0.03	0.03	0.03	0.04	0.04	0.04*
	(1.47)	(1.49)	(1.45)	(1.39)	(1.54)	(1.64)	(1.56)	(1.69)
Disaster, t-5	-0.02	-0.02	-0.02	-0.02	-0.02	-0.03	-0.03	-0.03
	(-0.52)	(-0.50)	(-0.60)	(-0.45)	(-0.53)	(-0.96)	(-0.74)	(-0.86)
Disaster, t-6	0.01	0.01	0.01	0.01	0.01	-0.00	0.00	0.00
	(0.50)	(0.56)	(0.44)	(0.61)	(0.54)	(-0.01)	(0.17)	(0.11)
Disaster, t-7	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.02
	(0.69)	(0.72)	(0.72)	(0.72)	(0.69)	(1.01)	(0.99)	(0.97)
Disaster, t-8	-0.07***	-0.07***	-0.07***	-0.06***	-0.07***	-0.05**	-0.05**	-0.05**
	(-3.33)	(-3.20)	(-3.07)	(-2.90)	(-3.40)	(-2.09)	(-1.97)	(-2.28)
Disaster, t-9	-0.04	-0.04	-0.04	-0.04	-0.04	-0.03	-0.03	-0.03
	(-1.32)	(-1.34)	(-1.44)	(-1.44)	(-1.32)	(-1.24)	(-1.23)	(-1.13)
Disaster, t-10	0.02	0.02	0.02	0.03	0.02	0.02	0.02	0.02
	(0.69)	(0.75)	(0.65)	(0.71)	(0.76)	(0.51)	(0.57)	(0.61)
Disaster, t-11	0.02	0.02	0.02	0.02	0.02	0.01	0.01	0.01
	(1.01)	(1.02)	(0.92)	(1.13)	(0.94)	(0.56)	(0.77)	(0.58)
Disaster, t-12	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03
	(-0.64)	(-0.68)	(-0.66)	(-0.62)	(-0.74)	(-0.71)	(-0.67)	(-0.78)
Dep. var., t-1 to t-12	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Change in Import Prices, t-1		3.18	2.37	3.00	4.06	9.38	9.02	11.30
		(0.49)	(0.38)	(0.46)	(0.59)	(1.13)	(1.09)	(1.30)
GDP (Ratio to Trend), t-1			2.74**			2.81**		
			(2.05)			(2.03)		
Industrial Production, t-1				0.23			0.23	
				(1.33)			(1.41)	
Unemployment, t-1					0.01			0.01
					(0.78)			(0.66)
Change in Nom. Exch. Rate (USD), t-1						-0.57	-0.40	-0.65
						(-0.45)	(-0.31)	(-0.51)
Change in Oil Prices, t-1						0.85***	0.85***	0.84***
						(3.71)	(3.86)	(3.74)
Observations	289	289	289	289	289	289	289	289
Degrees of freedom	25	26	27	27	27	29	29	29

t statistics in parentheses
$^{*}\ p < 0.1,\ ^{**}\ p < 0.05,\ ^{***}\ p < 0.01$

Table 7: Determinants of headline inflation, Italy, 1996-2021

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Disaster, t	0.01	0.01	0.01	0.02*	0.02	0.02	0.02*	0.03**
	(1.07)	(0.95)	(1.07)	(1.92)	(1.56)	(1.44)	(1.76)	(2.07)
Disaster, t-1	0.02**	0.00	0.00	0.01	0.01	0.01	0.01	0.02
	(2.02)	(0.20)	(0.26)	(1.02)	(0.78)	(0.61)	(0.99)	(1.22)
Disaster, t-2	-0.01*	-0.02	-0.01	-0.00	-0.01	-0.00	0.00	0.01
	(-1.87)	(-1.14)	(-0.97)	(-0.15)	(-0.44)	(-0.28)	(0.08)	(0.33)
Disaster, t-3	-0.02	-0.02	-0.02	-0.00	-0.01	-0.04	-0.03	-0.03
	(-1.47)	(-0.69)	(-0.61)	(-0.16)	(-0.28)	(-1.31)	(-1.07)	(-0.96)
Disaster, t-4	-0.02	0.01	0.01	0.02	0.02	0.01	0.01	0.01
	(-0.78)	(0.42)	(0.51)	(0.89)	(0.76)	(0.20)	(0.42)	(0.53)
Disaster, t-5	0.01	-0.04	-0.04	-0.03	-0.03	-0.04**	-0.04**	-0.03*
	(0.19)	(-1.50)	(-1.51)	(-1.07)	(-1.11)	(-2.59)	(-2.05)	(-1.84)
Disaster, t-6	0.03	-0.00	0.00	0.01	0.01	0.00	0.01	0.01
	(0.82)	(-0.00)	(0.03)	(0.40)	(0.36)	(0.13)	(0.33)	(0.49)
Disaster, t-7	0.00	-0.01	-0.00	0.01	0.00	-0.01	0.00	0.00
	(0.37)	(-0.26)	(-0.21)	(0.32)	(0.20)	(-0.26)	(0.06)	(0.26)
Disaster, t-8	-0.01	-0.01	-0.01	0.00	-0.00	-0.00	0.01	0.01
	(-0.42)	(-0.33)	(-0.31)	(0.02)	(-0.02)	(-0.00)	(0.15)	(0.31)
Disaster, t-9	-0.04**	-0.05***	-0.05***	-0.04**	-0.04**	-0.05***	-0.04***	-0.04**
	(-2.27)	(-2.92)	(-2.72)	(-2.23)	(-2.21)	(-3.23)	(-2.85)	(-2.42)
Disaster, t-10	-0.01	-0.02	-0.01	-0.01	-0.01	-0.01	-0.01	-0.00
	(-1.07)	(-0.89)	(-0.85)	(-0.35)	(-0.40)	(-0.96)	(-0.58)	(-0.30)
Disaster, t-11	-0.02	-0.03*	-0.03*	-0.02	-0.02	-0.03	-0.02	-0.02
	(-1.45)	(-1.71)	(-1.75)	(-1.31)	(-1.25)	(-1.42)	(-1.24)	(-1.01)
Disaster, t-12	0.02**	0.02	0.02	0.03*	0.03*	0.03**	0.03**	0.04**
	(2.08)	(1.36)	(1.39)	(1.74)	(1.72)	(2.14)	(2.24)	(2.57)
Dep. var., t-1 to t-12	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Change in Import Prices, t-1		-10.89	-10.89	-10.46	-10.88	-9.75	-9.77	-9.98
		(-1.18)	(-1.18)	(-1.16)	(-1.21)	(-1.11)	(-1.12)	(-1.17)
GDP (Ratio to Trend), t-1			0.84			0.36		
			(0.87)			(0.38)		
Industrial Production, t-1				0.64**			0.35	
				(2.59)			(1.25)	
Unemployment, t-1					-0.02			-0.02*
					(-1.65)			(-1.88)
Change in Nom. Exch. Rate (USD), t-1						1.99	2.07	2.34
						(1.38)	(1.40)	(1.60)
Change in Oil Prices, t-1						1.02***	0.95**	1.04***
						(2.81)	(2.53)	(3.15)
Observations	290	193	193	193	193	193	193	193
Degrees of freedom	25	26	27	27	27	29	29	29

t statistics in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 8: Determinants of headline inflation, Spain, 1996-2021

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Disaster, t	0.02	-0.04	-0.03	-0.07	-0.07	-0.05	-0.08	-0.09
	(0.46)	(-0.23)	(-0.16)	(-0.43)	(-0.44)	(-0.44)	(-0.70)	(-0.82)
Disaster, t-1	-0.03	-0.02	-0.01	-0.05	-0.05	-0.11	-0.14	-0.16
	(-0.76)	(-0.15)	(-0.06)	(-0.38)	(-0.41)	(-0.88)	(-1.11)	(-1.20)
Disaster, t-2	0.02	0.09	0.11	0.06	0.06	0.07	0.04	0.03
	(0.26)	(0.52)	(0.57)	(0.33)	(0.32)	(0.50)	(0.27)	(0.19)
Disaster, t-3	0.02	0.05	0.05	0.02	0.01	0.01	-0.02	-0.03
	(0.65)	(0.58)	(0.64)	(0.19)	(0.17)	(0.14)	(-0.31)	(-0.53)
Disaster, t-4	-0.01	-0.08	-0.07	-0.11	-0.11	-0.05	-0.08	-0.09
	(-0.14)	(-0.81)	(-0.76)	(-1.13)	(-1.13)	(-0.54)	(-0.82)	(-0.92)
Disaster, t-5	0.02	0.11	0.11	0.07	0.07	0.07	0.04	0.03
	(0.84)	(1.56)	(1.54)	(1.07)	(1.01)	(0.86)	(0.52)	(0.37)
Disaster, t-6	-0.03	-0.05	-0.05	-0.09	-0.09	-0.03	-0.06	-0.07
	(-0.74)	(-0.36)	(-0.33)	(-0.61)	(-0.57)	(-0.20)	(-0.43)	(-0.48)
Disaster, t-7	0.04	-0.01	0.01	-0.04	-0.04	0.13	0.10	0.08
	(0.89)	(-0.08)	(0.10)	(-0.32)	(-0.34)	(0.88)	(0.65)	(0.58)
Disaster, t-8	0.03	-0.07	-0.04	-0.07	-0.11	0.05	0.03	-0.01
	(1.00)	(-0.76)	(-0.43)	(-0.74)	(-1.07)	(0.32)	(0.16)	(-0.04)
Disaster, t-9	0.07	0.21***	0.24***	0.19***	0.18***	0.15**	0.11*	0.09
	(1.45)	(3.82)	(3.15)	(2.62)	(3.04)	(2.13)	(1.82)	(1.21)
Disaster, t-10	0.03	0.06	0.08	0.02	0.03	-0.03	-0.07	-0.08
	(0.66)	(0.37)	(0.58)	(0.16)	(0.16)	(-0.18)	(-0.37)	(-0.41)
Disaster, t-11	0.04**	0.06	0.07	0.02	0.03	0.02	-0.01	-0.02
	(2.51)	(0.90)	(1.03)	(0.35)	(0.45)	(0.32)	(-0.14)	(-0.20)
Disaster, t-12	0.01	-0.09	-0.08	-0.13	-0.12	-0.09	-0.13	-0.13
	(0.25)	(-1.02)	(-0.87)	(-1.42)	(-1.29)	(-0.92)	(-1.28)	(-1.30)
Dep. var., t-1 to t-12	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Change in Import Prices, t-1		3.43	1.89	1.39	2.55	6.34	5.41	6.58
		(0.23)	(0.12)	(0.09)	(0.17)	(0.42)	(0.36)	(0.44)
GDP (Ratio to Trend), t-1			0.70			0.49		
			(0.91)			(0.51)		
Industrial Production, t-1				0.73**			0.55*	
				(2.39)			(1.71)	
Unemployment, t-1					-0.01			-0.01
					(-1.41)			(-1.57)
Change in Nom. Exch. Rate (USD), t-1						1.25	1.29	1.25
						(0.69)	(0.71)	(0.68)
Change in Oil Prices, t-1						1.98***	1.94***	2.00***
						(5.03)	(4.83)	(5.19)
Observations	290	193	193	193	193	193	193	193
Degrees of freedom	25	26	27	27	27	29	29	29

t statistics in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 9: Determinants of core inflation, France, 1996-2021

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Disaster, t	0.01	0.01	0.01	0.00	0.01	0.01	0.01	0.01
	(0.60)	(0.52)	(0.51)	(0.28)	(0.89)	(0.48)	(0.32)	(0.72)
Disaster, t-1	0.04***	0.03***	0.03***	0.03**	0.04***	0.03***	0.03**	0.04***
	(3.15)	(2.69)	(2.68)	(2.53)	(3.47)	(2.61)	(2.48)	(3.29)
Disaster, t-2	-0.06**	-0.06**	-0.06**	-0.06**	-0.05**	-0.06**	-0.06**	-0.05**
	(-2.32)	(-2.40)	(-2.38)	(-2.33)	(-2.23)	(-2.30)	(-2.27)	(-2.10)
Disaster, t-3	0.01	0.01	0.01	0.00	0.01	0.01	0.00	0.01
	(0.69)	(0.63)	(0.62)	(0.35)	(0.78)	(0.51)	(0.31)	(0.61)
Disaster, t-4	-0.03*	-0.03**	-0.03**	-0.03**	-0.03*	-0.03*	-0.03*	-0.03*
	(-1.87)	(-2.10)	(-2.09)	(-2.07)	(-1.97)	(-1.85)	(-1.86)	(-1.76)
Disaster, t-5	0.00	0.00	0.00	-0.00	0.00	0.00	0.00	0.01
	(0.35)	(0.18)	(0.17)	(-0.20)	(0.16)	(0.42)	(0.05)	(0.51)
Disaster, t-6	0.00	0.00	0.00	-0.00	0.00	-0.00	-0.01	-0.01
	(0.33)	(0.10)	(0.08)	(-0.29)	(0.05)	(-0.31)	(-0.56)	(-0.40)
Disaster, t-7	0.01	0.01	0.01	0.00	0.01	0.00	-0.00	0.00
	(0.96)	(0.73)	(0.73)	(0.26)	(0.57)	(0.18)	(-0.10)	(0.15)
Disaster, t-8	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
	(0.91)	(0.91)	(0.89)	(0.48)	(0.70)	(1.02)	(0.64)	(0.81)
Disaster, t-9	-0.01	-0.01	-0.01	-0.01	-0.01	-0.00	-0.01	-0.01
	(-0.46)	(-0.40)	(-0.42)	(-0.75)	(-0.59)	(-0.31)	(-0.56)	(-0.52)
Disaster, t-10	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
	(1.25)	(1.18)	(1.18)	(0.81)	(0.98)	(1.05)	(0.78)	(0.73)
Disaster, t-11	0.02*	0.02	0.01	0.01	0.01	0.02*	0.01	0.01
	(1.77)	(1.49)	(1.48)	(1.02)	(1.11)	(1.74)	(1.32)	(1.30)
Disaster, t-12	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.02	-0.02
	(-0.47)	(-0.61)	(-0.61)	(-0.83)	(-0.70)	(-0.83)	(-0.99)	(-0.89)
Dep. var., t-1 to t-12	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Change in Import Prices, t-1		2.36	2.35	1.91	2.05	3.65	3.18	3.09
		(1.05)	(1.04)	(0.89)	(0.95)	(1.49)	(1.35)	(1.33)
GDP (Ratio to Trend), t-1			0.07			0.07		
			(0.12)			(0.13)		
Industrial Production, t-1				0.42			0.37	
				(1.54)			(1.32)	
Unemployment, t-1					-0.05***			-0.05***
					(-2.87)			(-3.16)
Change in Nom. Exch. Rate (USD), t-1						-0.71	-0.68	-0.46
						(-1.40)	(-1.31)	(-0.92)
Change in Oil Prices, t-1						0.17	0.15	0.20
						(1.10)	(0.98)	(1.32)
Observations	290	265	265	265	265	265	265	265
Degrees of freedom	25	26	27	27	27	29	29	29

t statistics in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 10: Determinants of core inflation, Germany, 1996-2021

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Disaster, t	0.00	-0.00	-0.00	0.00	-0.00	-0.00	0.00	-0.00
	(0.01)	(-0.07)	(-0.15)	(0.03)	(-0.13)	(-0.11)	(0.08)	(-0.08)
Disaster, t-1	0.02	0.02	0.01	0.02	0.02	0.02	0.02	0.02
	(0.69)	(0.70)	(0.63)	(0.96)	(0.84)	(0.85)	(1.21)	(1.02)
Disaster, t-2	-0.02	-0.02	-0.02	-0.02	-0.02	-0.03	-0.03	-0.03
	(-1.11)	(-1.09)	(-1.12)	(-1.12)	(-1.10)	(-1.38)	(-1.33)	(-1.30)
Disaster, t-3	-0.04*	-0.04*	-0.04*	-0.03*	-0.04*	-0.03	-0.03	-0.03
	(-1.73)	(-1.76)	(-1.75)	(-1.71)	(-1.79)	(-1.48)	(-1.43)	(-1.54)
Disaster, t-4	0.03*	0.03	0.03	0.03**	0.03*	0.03	0.03	0.03
	(1.68)	(1.64)	(1.58)	(2.00)	(1.86)	(1.25)	(1.59)	(1.50)
Disaster, t-5	-0.06**	-0.06**	-0.06**	-0.06**	-0.06**	-0.06**	-0.06*	-0.06**
	(-2.24)	(-2.25)	(-2.26)	(-2.01)	(-2.10)	(-2.17)	(-1.94)	(-2.05)
Disaster, t-6	-0.00	-0.00	-0.00	-0.00	-0.00	-0.01	-0.01	-0.01
	(-0.07)	(-0.10)	(-0.11)	(-0.12)	(-0.12)	(-0.22)	(-0.22)	(-0.21)
Disaster, t-7	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03
	(-1.36)	(-1.39)	(-1.38)	(-1.23)	(-1.27)	(-1.44)	(-1.29)	(-1.34)
Disaster, t-8	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
	(0.43)	(0.43)	(0.41)	(0.41)	(0.46)	(0.44)	(0.44)	(0.49)
Disaster, t-9	-0.05	-0.05	-0.05	-0.05*	-0.05*	-0.05	-0.05*	-0.05
	(-1.64)	(-1.62)	(-1.63)	(-1.80)	(-1.70)	(-1.54)	(-1.70)	(-1.60)
Disaster, t-10	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02
	(-0.67)	(-0.69)	(-0.68)	(-0.66)	(-0.73)	(-0.80)	(-0.76)	(-0.82)
Disaster, t-11	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
	(0.76)	(0.75)	(0.75)	(0.83)	(0.81)	(0.66)	(0.73)	(0.72)
Disaster, t-12	-0.02	-0.02	-0.02	-0.02	-0.02	-0.01	-0.01	-0.01
	(-0.40)	(-0.38)	(-0.36)	(-0.34)	(-0.31)	(-0.30)	(-0.29)	(-0.27)
Dep. var., t-1 to t-12	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Change in Import Prices, t-1		-1.73	-1.94	-2.30	-4.00	11.44	10.01	7.36
		(-0.27)	(-0.30)	(-0.36)	(-0.60)	(1.34)	(1.19)	(0.84)
GDP (Ratio to Trend), t-1			1.16			1.28		
			(1.13)			(1.26)		
Industrial Production, t-1				0.40***			0.39***	
				(2.75)			(2.72)	
Unemployment, t-1					-0.01			-0.01
					(-1.63)			(-1.36)
Change in Nom. Exch. Rate (USD), t-1						-2.45*	-2.26*	-2.02
						(-1.85)	(-1.72)	(-1.52)
Change in Oil Prices, t-1						-0.09	-0.10	-0.08
						(-0.48)	(-0.51)	(-0.40)
Observations	289	289	289	289	289	289	289	289
Degrees of freedom	25	26	27	27	27	29	29	29

t statistics in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 11: Determinants of core inflation, Italy, 1996-2021

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Disaster, t	0.02*	0.03**	0.03**	0.04**	0.05***	0.03**	0.04**	0.05***
	(1.73)	(2.16)	(2.11)	(2.57)	(3.39)	(2.04)	(2.52)	(3.30)
Disaster, t-1	-0.00	-0.01	-0.01	-0.00	0.01	-0.01	-0.00	0.01
	(-0.11)	(-0.94)	(-0.95)	(-0.09)	(1.41)	(-0.87)	(-0.14)	(1.40)
Disaster, t-2	0.04	0.04	0.04	0.05*	0.07**	0.04	0.05*	0.07**
	(1.61)	(1.53)	(1.52)	(1.77)	(2.49)	(1.57)	(1.80)	(2.57)
Disaster, t-3	-0.06***	-0.07***	-0.07***	-0.06**	-0.04	-0.07***	-0.06**	-0.04*
	(-4.03)	(-2.84)	(-2.82)	(-2.43)	(-1.54)	(-2.90)	(-2.50)	(-1.71)
Disaster, t-4	-0.06	0.01	0.01	0.01	0.03	0.01	0.01	0.03
	(-1.10)	(0.44)	(0.45)	(0.82)	(1.50)	(0.42)	(0.81)	(1.51)
Disaster, t-5	0.02	-0.03**	-0.03**	-0.03*	-0.01	-0.03**	-0.03	-0.01
	(0.40)	(-2.30)	(-2.25)	(-1.75)	(-0.93)	(-2.03)	(-1.48)	(-0.64)
Disaster, t-6	0.02	-0.01	-0.01	-0.00	0.01	-0.01	-0.00	0.01
	(0.75)	(-0.70)	(-0.69)	(-0.11)	(1.23)	(-0.64)	(-0.06)	(1.40)
Disaster, t-7	0.03***	0.01	0.01	0.02	0.03	0.01	0.02	0.03
	(2.89)	(0.42)	(0.42)	(0.76)	(1.48)	(0.41)	(0.77)	(1.54)
Disaster, t-8	-0.00	-0.01	-0.01	-0.01	0.01	-0.01	-0.00	0.01
	(-0.22)	(-0.34)	(-0.34)	(-0.16)	(0.29)	(-0.31)	(-0.14)	(0.38)
Disaster, t-9	-0.04***	-0.05**	-0.05**	-0.04**	-0.02	-0.05**	-0.04*	-0.02
	(-3.22)	(-2.50)	(-2.42)	(-2.04)	(-1.14)	(-2.40)	(-1.95)	(-1.03)
Disaster, t-10	-0.00	0.01	0.01	0.02	0.03*	0.01	0.02	0.03
	(-0.02)	(0.68)	(0.69)	(0.98)	(1.66)	(0.69)	(0.98)	(1.65)
Disaster, t-11	0.01	-0.01	-0.01	-0.00	0.01	-0.01	-0.00	0.01
	(0.62)	(-0.37)	(-0.39)	(-0.13)	(0.76)	(-0.41)	(-0.23)	(0.65)
Disaster, t-12	0.04***	0.04**	0.04**	0.04**	0.06***	0.04**	0.04**	0.06***
	(3.69)	(2.04)	(2.06)	(2.25)	(2.81)	(2.06)	(2.20)	(2.83)
Dep. var., t-1 to t-12	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Change in Import Prices, t-1		-18.27**	-18.27**	-17.90**	-18.24**	-18.25**	-18.22**	-18.71**
		(-2.06)	(-2.06)	(-2.06)	(-2.20)	(-2.07)	(-2.11)	(-2.27)
GDP (Ratio to Trend), t-1			0.28			0.25		
			(0.24)			(0.20)		
Industrial Production, t-1				0.49*			0.50*	
				(1.97)			(1.78)	
Unemployment, t-1					-0.06***			-0.06***
					(-3.74)			(-3.77)
Change in Nom. Exch. Rate (USD), t-1						0.29	0.34	1.00
						(0.25)	(0.28)	(0.84)
Change in Oil Prices, t-1						0.08	-0.00	0.13
						(0.28)	(-0.02)	(0.54)
Observations	243	193	193	193	193	193	193	193
Degrees of freedom	25	26	27	27	27	29	29	29

t statistics in parentheses
$^{*}\ p < 0.1,\ ^{**}\ p < 0.05,\ ^{***}\ p < 0.01$

Table 12: Determinants of core inflation, Spain, 1996-2021

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Disaster, t	0.01	-0.01	0.02	-0.02	-0.05	0.02	-0.02	-0.04
	(0.17)	(-0.13)	(0.19)	(-0.25)	(-0.54)	(0.24)	(-0.20)	(-0.55)
Disaster, t-1	-0.05	-0.01	0.02	-0.01	-0.04	0.02	-0.01	-0.05
	(-0.62)	(-0.11)	(0.22)	(-0.11)	(-0.46)	(0.19)	(-0.08)	(-0.49)
Disaster, t-2	-0.09	-0.09	-0.07	-0.09	-0.12*	-0.07	-0.09	-0.12*
	(-1.36)	(-1.23)	(-1.00)	(-1.50)	(-1.69)	(-1.01)	(-1.49)	(-1.69)
Disaster, t-3	0.06*	0.11**	0.13**	0.11**	0.08*	0.13**	0.11**	0.08*
	(1.93)	(2.38)	(2.59)	(2.37)	(1.87)	(2.53)	(2.30)	(1.84)
Disaster, t-4	-0.08	-0.10	-0.08	-0.09	-0.12*	-0.08	-0.09	-0.12*
	(-1.40)	(-1.38)	(-1.05)	(-1.53)	(-1.86)	(-1.09)	(-1.62)	(-1.87)
Disaster, t-5	0.02	0.08	0.09	0.07	0.05	0.09	0.07	0.04
	(0.56)	(1.41)	(1.56)	(1.34)	(0.96)	(1.56)	(1.40)	(0.94)
Disaster, t-6	-0.04	-0.05	-0.03	-0.06	-0.08	-0.03	-0.06	-0.08
	(-0.70)	(-0.75)	(-0.45)	(-0.91)	(-1.13)	(-0.41)	(-0.91)	(-1.11)
Disaster, t-7	0.01	0.05	0.10	0.05	0.02	0.10	0.05	0.02
	(0.27)	(0.76)	(1.25)	(0.81)	(0.29)	(1.25)	(0.75)	(0.39)
Disaster, t-8	-0.03	-0.07	-0.01	-0.03	-0.09	-0.00	-0.03	-0.09
	(-0.54)	(-1.01)	(-0.06)	(-0.33)	(-1.40)	(-0.03)	(-0.37)	(-1.34)
Disaster, t-9	0.02	0.06	0.11	0.05	0.02	0.12	0.06	0.02
	(0.37)	(0.69)	(1.26)	(0.69)	(0.29)	(1.26)	(0.74)	(0.29)
Disaster, t-10	-0.07	-0.10	-0.05	-0.12	-0.13	-0.05	-0.11	-0.13
	(-0.78)	(-1.04)	(-0.83)	(-1.43)	(-1.33)	(-0.74)	(-1.36)	(-1.34)
Disaster, t-11	-0.02	0.02	0.05	-0.01	-0.02	0.06	-0.01	-0.01
	(-0.56)	(0.30)	(0.86)	(-0.25)	(-0.28)	(0.84)	(-0.14)	(-0.21)
Disaster, t-12	-0.17	-0.22	-0.19	-0.25	-0.25	-0.19	-0.25	-0.25
	(-1.13)	(-1.24)	(-1.05)	(-1.37)	(-1.39)	(-1.01)	(-1.35)	(-1.37)
Dep. var., t-1 to t-12	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Change in Import Prices, t-1		1.91	-0.98	-1.29	0.07	-4.72	-4.37	-2.30
		(0.17)	(-0.09)	(-0.13)	(0.01)	(-0.39)	(-0.39)	(-0.20)
GDP (Ratio to Trend), t-1			1.26**			1.28**		
			(2.22)			(2.14)		
Industrial Production, t-1				0.94**			0.96**	
				(2.47)			(2.40)	
Unemployment, t-1					-0.01**			-0.01*
					(-1.98)			(-1.95)
Change in Nom. Exch. Rate (USD), t-1						0.72	0.43	0.51
						(0.48)	(0.31)	(0.36)
Change in Oil Prices, t-1						0.04	-0.08	0.06
						(0.24)	(-0.45)	(0.36)
Observations	230	192	192	192	192	192	192	192
Degrees of freedom	25	26	27	27	27	29	29	29

t statistics in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 13: Determinants of sub-indices' inflation, France, 1996-2021

	FoodBev	AlcTob	ClothShoes	HoElG	HoEq	Health	Transp	Comm	RecrCult	Educ	RestHot	Misc
Disaster, t	0.05*	0.02	-0.06	0.04*	-0.01	-0.02	0.02	0.11	0.02	0.01	0.00	0.03
	(1.76)	(0.58)	(-0.73)	(1.87)	(-0.62)	(-0.49)	(0.43)	(1.44)	(1.60)	(0.58)	(0.05)	(1.00)
Disaster, t-1	0.03	0.14**	0.24*	-0.04*	-0.02	-0.02	0.06	0.02	0.04	0.00	0.04	0.04***
	(0.52)	(2.01)	(1.91)	(-1.93)	(-0.85)	(-0.83)	(0.94)	(0.46)	(1.63)	(0.24)	(0.64)	(4.53)
Disaster, t-2	-0.02	0.11	-0.28**	0.07**	-0.07***	0.03	0.06*	0.02	-0.02	0.01	0.01	-0.02
	(-0.25)	(0.54)	(-2.15)	(2.05)	(-3.87)	(0.67)	(1.72)	(0.66)	(-1.32)	(0.83)	(0.30)	(-1.33)
Disaster, t-3	-0.01	0.24	-0.03	-0.03	0.05	-0.03	0.01	0.07*	-0.02	-0.01	-0.03*	0.03**
	(-0.82)	(0.95)	(-0.56)	(-0.69)	(1.17)	(-1.06)	(0.18)	(1.72)	(-0.92)	(-1.25)	(-1.72)	(2.06)
Disaster, t-4	0.04	-0.02	-0.06	-0.04**	0.02	0.04***	-0.04	-0.51***	-0.04**	0.01	-0.02	-0.00
	(0.48)	(-0.34)	(-0.78)	(-2.11)	(1.20)	(2.66)	(-1.20)	(-3.51)	(-2.19)	(0.49)	(-0.91)	(-0.45)
Disaster, t-5	0.01	0.07	-0.05	0.07***	-0.01	0.06	0.15***	-0.07	0.03	0.03	0.05	0.01
	(0.49)	(0.71)	(-0.53)	(3.00)	(-0.29)	(1.23)	(4.39)	(-1.36)	(1.49)	(0.91)	(1.27)	(0.78)
Disaster, t-6	-0.05	-0.06	-0.07	-0.05**	-0.01	0.01	-0.03	0.11**	0.01	0.01	0.03	0.03*
	(-0.74)	(-1.07)	(-1.35)	(-2.32)	(-0.90)	(0.24)	(-1.00)	(2.00)	(0.33)	(1.00)	(0.93)	(1.89)
Disaster, t-7	0.02	-0.07**	-0.18**	0.03	-0.00	0.01	0.05	0.02	-0.03	-0.03	0.02	0.01
	(0.78)	(-2.21)	(-2.57)	(1.14)	(-0.01)	(0.34)	(1.43)	(0.43)	(-0.93)	(-1.16)	(0.83)	(1.05)
Disaster, t-8	0.01	0.02	0.09	0.07**	0.04***	-0.02	0.01	0.09	0.05***	-0.01	0.02	-0.00
	(0.36)	(1.00)	(0.97)	(2.23)	(3.58)	(-0.75)	(0.13)	(1.25)	(3.73)	(-1.34)	(1.24)	(-0.08)
Disaster, t-9	0.07**	0.04	-0.05	0.10***	0.01	-0.10***	0.13**	-0.02	0.02	0.02	-0.03	0.02
	(1.99)	(0.95)	(-0.40)	(2.64)	(0.37)	(-4.22)	(2.58)	(-0.25)	(1.23)	(1.09)	(-1.34)	(1.53)
Disaster, t-10	0.01	0.01	-0.04	-0.07	0.01	0.07***	-0.11	0.01	-0.01	0.01*	-0.02	0.01
	(0.55)	(0.21)	(-0.55)	(-1.34)	(0.56)	(2.63)	(-1.48)	(0.16)	(-0.67)	(1.67)	(-0.85)	(0.47)
Disaster, t-11	-0.03	-0.10	0.05	0.08***	0.02	-0.05	0.07*	-0.00	-0.00	-0.01	0.01	-0.01
	(-0.28)	(-1.48)	(0.71)	(2.98)	(0.35)	(-1.54)	(1.90)	(-0.09)	(-0.03)	(-0.62)	(0.27)	(-0.82)
Disaster, t-12	-0.07	-0.06	-0.19	-0.07	-0.00	0.05	-0.10	-0.13	-0.01	0.00	0.04	-0.03
	(-0.95)	(-1.19)	(-0.76)	(-1.59)	(-0.19)	(1.19)	(-1.29)	(-1.13)	(-0.45)	(0.69)	(0.69)	(-1.34)
Dep. var., t-1 to t-12	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Change in Import Prices, t-1	11.95	23.94*	17.98*	0.55	9.70***	-6.18	2.80	-3.19	8.70*	-9.21**	5.79	3.45
	(1.17)	(1.69)	(1.78)	(0.11)	(2.80)	(-0.94)	(0.27)	(-0.23)	(1.78)	(-2.43)	(1.15)	(1.39)
Unemployment, t-1	-0.06	-0.06	0.00	-0.02	-0.06***	-0.03	-0.05	-0.06	0.00	-0.04***	-0.02	-0.01
	(-1.35)	(-1.51)	(0.01)	(-0.87)	(-3.03)	(-0.70)	(-1.01)	(-1.00)	(0.11)	(-2.88)	(-0.88)	(-0.64)
Change in Nom. Exch. Rate (USD), t-1	-0.86	-6.58**	-1.11	1.30	0.30	0.60	4.33*	0.09	-1.46	0.29	-0.05	-1.03
	(-0.57)	(-2.46)	(-0.29)	(1.12)	(0.41)	(0.42)	(1.82)	(0.04)	(-1.59)	(0.41)	(-0.05)	(-1.57)
Change in Oil Prices, t-1	-0.51	-0.00	1.11	1.23***	0.19	-0.00	5.09***	-0.41	-0.05	-0.09	0.06	-0.09
	(-1.05)	(-0.01)	(1.07)	(4.34)	(0.97)	(-0.01)	(10.32)	(-0.54)	(-0.29)	(-0.79)	(0.18)	(-0.50)
Observations	264	264	264	264	264	264	264	264	264	264	264	264
Degrees of freedom	29	29	29	29	29	29	29	29	29	29	29	29

t statistics in parentheses
$^{*}\ p < 0.1,\ ^{**}\ p < 0.05,\ ^{***}\ p < 0.01$

FoodBev: food and non-alcoholic beverages; *AlcTob*: alcoholic beverages, tobacco and narcotics; *ClothShoes*: clothing and footwear; *HoElG*: housing, water, electricity, gas and other fuels; *HoEq*: furnishings, household equipment and routine household maintenance; *Health*: health; *Transp*: transport; *Comm*: communications; *RecrCult*: recreation and culture; *Educ*: education; *RestHot*: restaurants and hotels; *Misc*: miscellaneous goods and services.

Table 14: Determinants of sub-indices' inflation, Germany, 1996-2021

	FoodBev	AlcTob	ClothShoes	HoElG	HoEq	Health	Transp	Comm	RecrCult	Educ	RestHot	Misc
Disaster, t	-0.02	0.04	-0.04	-0.02	-0.02***	0.01	0.03	-0.06**	0.05	-0.02	-0.01	0.00
	(-0.20)	(0.76)	(-0.99)	(-1.40)	(-3.19)	(0.20)	(0.87)	(-2.41)	(0.57)	(-0.40)	(-0.13)	(0.22)
Disaster, t-1	0.05	-0.00	0.04	0.01	0.02	-0.01	0.04	0.05	0.16	0.03	0.06	-0.01
	(1.28)	(-0.12)	(0.94)	(0.75)	(1.43)	(-0.43)	(0.57)	(1.26)	(1.09)	(0.90)	(0.92)	(-0.48)
Disaster, t-2	-0.04	-0.09	0.01	0.04**	-0.03	-0.04	0.03	-0.04	-0.01	-0.05*	-0.13	-0.04**
	(-0.77)	(-0.47)	(0.27)	(2.13)	(-1.60)	(-1.06)	(0.97)	(-0.48)	(-0.07)	(-1.75)	(-1.03)	(-2.42)
Disaster, t-3	-0.15*	-0.02	-0.06	-0.07***	-0.02	-0.06	-0.20***	-0.07	-0.13	-0.12	0.01	0.02
	(-1.89)	(-0.61)	(-1.27)	(-3.97)	(-1.40)	(-0.73)	(-4.80)	(-1.37)	(-1.26)	(-1.45)	(0.12)	(0.45)
Disaster, t-4	-0.06	-0.01	-0.04	0.02	0.01	-0.04	0.03	-0.01	0.03	-0.01	0.31*	-0.01
	(-1.16)	(-0.28)	(-0.93)	(0.91)	(0.44)	(-0.96)	(0.80)	(-0.21)	(0.34)	(-0.19)	(1.66)	(-0.55)
Disaster, t-5	0.06	0.35**	-0.01	0.08	0.00	0.22	0.07	0.02	-0.21*	-0.41	-0.24*	0.05
	(1.38)	(1.98)	(-0.17)	(1.50)	(0.12)	(0.88)	(0.71)	(0.65)	(-1.67)	(-1.30)	(-1.73)	(0.73)
Disaster, t-6	0.00	0.07**	-0.03	-0.01	-0.02	-0.06	-0.04	0.04	0.07	-0.09*	0.01	0.01
	(0.11)	(2.00)	(-0.47)	(-0.22)	(-1.30)	(-1.14)	(-0.45)	(0.99)	(0.36)	(-1.71)	(0.09)	(0.37)
Disaster, t-7	0.06	-0.02	-0.02	0.01	-0.01	-0.08	-0.01	0.03	0.01	0.09	-0.24	-0.06***
	(1.13)	(-0.12)	(-0.34)	(0.42)	(-0.59)	(-0.95)	(-0.23)	(0.89)	(0.15)	(1.12)	(-1.01)	(-3.35)
Disaster, t-8	-0.01	-0.01	-0.03	-0.09**	-0.00	0.00	-0.09**	0.05	-0.00	0.02	0.01	0.05
	(-0.27)	(-0.35)	(-0.46)	(-2.47)	(-0.07)	(0.13)	(-2.31)	(1.20)	(-0.00)	(0.42)	(0.13)	(1.30)
Disaster, t-9	-0.08	-0.03	0.03	0.00	-0.02	-0.00	0.01	-0.01	-0.26**	-0.02	-0.09	0.01
	(-1.34)	(-0.90)	(0.31)	(0.12)	(-0.88)	(-0.14)	(0.12)	(-0.42)	(-2.05)	(-0.43)	(-0.88)	(0.94)
Disaster, t-10	-0.04	0.02	-0.05	-0.01	0.02	-0.02	-0.01	-0.02	-0.09	-0.10*	0.02	-0.02
	(-0.46)	(0.44)	(-1.08)	(-0.24)	(0.80)	(-0.31)	(-0.11)	(-0.56)	(-0.66)	(-1.82)	(0.33)	(-1.25)
Disaster, t-11	-0.05	-0.02	-0.12***	0.00	-0.00	-0.03	0.05	0.02	0.16	0.00	0.00	-0.01
	(-1.37)	(-0.30)	(-3.00)	(0.11)	(-0.02)	(-0.65)	(1.01)	(0.51)	(0.84)	(0.10)	(0.07)	(-1.47)
Disaster, t-12	-0.07**	-0.04	-0.11**	-0.01	-0.04**	0.06	-0.02	0.01	-0.16	-0.01	0.09	0.02*
	(-2.36)	(-1.08)	(-2.47)	(-0.69)	(-2.32)	(1.01)	(-0.57)	(0.23)	(-0.70)	(-0.39)	(1.42)	(1.80)
Dep. var., t-1 to t-12	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Change in Import Prices, t-1	2.84	22.97	3.51	-6.29	4.82	54.77	7.94	-11.61	80.02*	26.26	-19.29	16.52**
	(0.20)	(1.44)	(0.18)	(-0.58)	(1.14)	(1.60)	(0.36)	(-0.77)	(1.92)	(0.62)	(-0.99)	(2.07)
Unemployment, t-1	-0.01	0.03	-0.07**	0.01	-0.01	0.04	0.02	-0.02	-0.07**	0.08**	-0.04**	0.00
	(-0.75)	(1.35)	(-2.42)	(0.83)	(-1.02)	(1.19)	(1.27)	(-1.00)	(-2.22)	(2.47)	(-2.14)	(0.13)
Change in Nom. Exch. Rate (USD), t-1	-2.63	-5.58**	-2.48	1.32	-0.80	-9.51	2.22	1.53	-8.73	-8.81*	2.68	-4.28***
	(-1.22)	(-2.33)	(-0.78)	(0.74)	(-1.12)	(-1.08)	(0.60)	(0.80)	(-1.54)	(-1.96)	(0.87)	(-3.79)
Change in Oil Prices, t-1	-0.65*	-0.37	0.15	0.76**	-0.09	-0.16	4.28***	0.19	-0.62	0.59	0.58	-0.30
	(-1.75)	(-0.83)	(0.22)	(2.47)	(-0.44)	(-0.57)	(7.50)	(0.41)	(-0.70)	(0.94)	(1.32)	(-1.42)
Observations	289	289	289	289	289	289	289	289	289	289	289	289
Degrees of freedom	29	29	29	29	29	29	29	29	29	29	29	29

t statistics in parentheses
$^{*}\ p < 0.1,\ ^{**}\ p < 0.05,\ ^{***}\ p < 0.01$

FoodBev: food and non-alcoholic beverages; *AlcTob*: alcoholic beverages, tobacco and narcotics; *ClothShoes*: clothing and footwear; *HoElG*: housing, water, electricity, gas and other fuels; *HoEq*: furnishings, household equipment and routine household maintenance; *Health*: health; *Transp*: transport; *Comm*: communications; *RecrCult*: recreation and culture; *Educ*: education; *RestHot*: restaurants and hotels; *Misc*: miscellaneous goods and services.

Table 15: Determinants of sub-indices' inflation, Italy, 1996-2021

	FoodBev	AlcTob	ClothShoes	HoElG	HoEq	Health	Transp	Comm	RecrCult	Educ	RestHot	Misc
Disaster, t	0.01	-0.03	0.18***	0.04	-0.00	-0.01	0.01	-0.03	-0.01	0.04	-0.00	0.01
	(0.59)	(-0.68)	(2.70)	(1.18)	(-0.63)	(-0.29)	(0.13)	(-1.03)	(-0.32)	(0.91)	(-0.03)	(1.27)
Disaster, t-1	0.06*	0.02	0.09*	0.00	-0.01	-0.06	-0.02	0.15***	0.01	0.00	-0.03	-0.01
	(1.82)	(0.88)	(1.84)	(0.04)	(-1.31)	(-1.00)	(-0.41)	(3.65)	(0.42)	(0.14)	(-0.99)	(-0.39)
Disaster, t-2	-0.09***	0.02	0.51***	0.01	-0.00	0.03	-0.00	-0.01	0.01	-0.02	0.03	0.06***
	(-4.06)	(0.70)	(3.77)	(0.16)	(-0.62)	(0.84)	(-0.03)	(-0.31)	(0.51)	(-0.31)	(0.68)	(4.41)
Disaster, t-3	0.06*	-0.05	-0.07	-0.04	-0.01	-0.05	0.07	0.09***	-0.01	-0.21	0.03	-0.01
	(1.80)	(-1.33)	(-0.71)	(-1.12)	(-1.24)	(-1.64)	(0.92)	(2.93)	(-0.65)	(-0.70)	(1.54)	(-0.98)
Disaster, t-4	0.05***	0.01	0.18***	0.02	0.00	0.02**	0.06	0.04	-0.02	0.12***	-0.02	-0.01
	(2.62)	(0.17)	(3.16)	(0.91)	(0.01)	(2.12)	(0.58)	(1.00)	(-0.66)	(2.94)	(-1.05)	(-0.48)
Disaster, t-5	0.05	-0.06*	0.01	0.03	-0.03***	0.02	-0.09**	-0.15	-0.05	0.21***	-0.02	-0.00
	(0.95)	(-1.70)	(0.18)	(0.63)	(-2.62)	(1.53)	(-2.19)	(-1.64)	(-1.29)	(5.03)	(-1.30)	(-0.03)
Disaster, t-6	0.04	-0.00	0.11**	0.03	-0.01	-0.01	-0.04	0.17***	-0.02	0.03	0.03	0.02
	(0.82)	(-0.18)	(2.32)	(1.11)	(-1.12)	(-0.97)	(-0.64)	(3.57)	(-0.77)	(0.55)	(1.34)	(0.70)
Disaster, t-7	-0.00	-0.02	-0.08	-0.02	-0.00	0.02	0.01	0.07	-0.04*	0.01	0.04**	0.01
	(-0.08)	(-1.11)	(-0.86)	(-0.86)	(-0.47)	(0.96)	(0.23)	(1.20)	(-1.73)	(0.34)	(2.48)	(0.95)
Disaster, t-8	0.05	0.05	-0.21**	0.01	0.04***	-0.02	0.00	0.05	-0.04**	0.03	0.02	0.08***
	(1.64)	(1.49)	(-2.16)	(0.21)	(4.40)	(-1.12)	(0.03)	(1.65)	(-2.13)	(0.85)	(0.68)	(4.79)
Disaster, t-9	-0.04	0.00	-0.10	-0.04	-0.02	-0.01	-0.06	-0.35***	-0.01	0.04	0.02	0.01
	(-1.39)	(0.17)	(-0.96)	(-0.71)	(-1.52)	(-1.03)	(-0.96)	(-8.04)	(-0.27)	(0.96)	(1.23)	(0.78)
Disaster, t-10	0.01	-0.02	-0.07	0.01	0.00	0.04	0.02	-0.06	0.08**	0.04	0.05***	0.02
	(0.22)	(-1.27)	(-1.04)	(0.55)	(0.06)	(1.32)	(0.44)	(-1.00)	(2.55)	(0.81)	(2.84)	(1.27)
Disaster, t-11	0.03	-0.05	0.05	-0.14***	-0.01	-0.01	-0.15**	0.18**	-0.03	0.02	-0.00	-0.02
	(0.86)	(-1.51)	(0.96)	(-4.42)	(-0.88)	(-0.85)	(-2.22)	(2.29)	(-0.97)	(1.09)	(-0.03)	(-1.41)
Disaster, t-12	0.05**	0.02	0.01	0.07	0.02**	-0.01	0.09*	0.05	0.02	-0.00	0.03***	0.02
	(2.39)	(0.78)	(0.09)	(1.03)	(2.05)	(-1.34)	(1.88)	(0.92)	(0.66)	(-0.11)	(2.71)	(1.64)
Dep. var., t-1 to t-12	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Change in Import Prices, t-1	-7.94	8.20	-78.06	19.66	-4.15	-18.27	11.84	14.69	-10.37	-11.52	-4.83	-3.65
	(-0.93)	(0.75)	(-1.41)	(1.38)	(-1.10)	(-0.97)	(0.82)	(0.59)	(-1.37)	(-1.03)	(-0.81)	(-0.75)
Unemployment, t-1	-0.05***	-0.06*	-0.06	-0.02	-0.02**	-0.02	-0.01	-0.00	-0.02	-0.07	-0.05**	-0.05***
	(-2.81)	(-1.94)	(-1.28)	(-0.69)	(-2.57)	(-0.99)	(-0.34)	(-0.08)	(-1.44)	(-1.52)	(-2.54)	(-2.88)
Change in Nom. Exch. Rate (USD), t-1	0.64	5.66*	-1.71	5.92**	0.58	1.45	3.46	0.77	-1.67	2.73	0.63	1.75**
	(0.37)	(1.79)	(-0.26)	(2.54)	(0.59)	(1.09)	(1.05)	(0.27)	(-1.22)	(1.10)	(0.54)	(2.38)
Change in Oil Prices, t-1	-0.53	0.46	2.08	2.13***	0.10	-0.19	4.86***	-0.49	-0.03	-0.50	-0.24	0.36**
	(-1.10)	(0.87)	(0.85)	(2.79)	(0.52)	(-0.68)	(6.70)	(-0.80)	(-0.07)	(-0.93)	(-0.89)	(2.36)
Observations	192	192	192	192	192	192	192	192	192	192	192	192
Degrees of freedom	29	29	29	29	29	29	29	29	29	29	29	29

t statistics in parentheses
$^{*}\ p < 0.1,\ ^{**}\ p < 0.05,\ ^{***}\ p < 0.01$

FoodBev: food and non-alcoholic beverages; *AlcTob*: alcoholic beverages, tobacco and narcotics; *ClothShoes*: clothing and footwear; *HoEIG*: housing, water, electricity, gas and other fuels; *HoEq*: furnishings, household equipment and routine household maintenance; *Health*: health; *Transp*: transport; *Comm*: communications; *RecrCult*: recreation and culture; *Educ*: education; *RestHot*: restaurants and hotels; *Misc*: miscellaneous goods and services.

Table 16: Determinants of sub-indices' inflation, Spain, 1996-2021

	FoodBev	AlcTob	ClothShoes	HoElG	HoEq	Health	Transp	Comm	RecrCult	Educ	RestHot	Misc
Disaster, t	-0.09	0.28	-0.83**	0.38	-0.07	0.12	0.34**	0.19	0.15	-0.03	-0.00	0.00
	(-0.65)	(1.36)	(-2.07)	(0.83)	(-1.08)	(1.39)	(2.35)	(1.01)	(0.87)	(-0.40)	(-0.10)	(0.05)
Disaster, t-1	0.11	-0.10	-0.01	-0.72	0.01	0.11	-0.06	-0.02	-0.02	0.27	-0.10	-0.07**
	(0.67)	(-0.64)	(-0.02)	(-1.30)	(0.23)	(0.77)	(-0.25)	(-0.18)	(-0.15)	(0.91)	(-0.76)	(-2.13)
Disaster, t-2	-0.20	0.10	-0.74	-0.14	0.00	0.02	0.15	-0.08	-0.10	0.04	-0.22***	0.01
	(-1.60)	(0.43)	(-1.54)	(-1.46)	(0.07)	(0.29)	(0.41)	(-0.70)	(-0.71)	(0.35)	(-3.53)	(0.37)
Disaster, t-3	-0.12	-0.14	-0.09	-0.47	-0.08***	0.07	-0.11	-0.14***	0.36	0.27	0.01	-0.04
	(-1.53)	(-0.92)	(-0.35)	(-1.50)	(-2.76)	(0.82)	(-0.73)	(-2.71)	(1.45)	(1.28)	(0.20)	(-1.08)
Disaster, t-4	0.01	0.19	-0.59	-0.12	-0.03	-0.38	-0.23	-0.04	-0.07	-0.07	-0.16	-0.01
	(0.04)	(0.83)	(-1.31)	(-0.62)	(-1.44)	(-1.21)	(-1.14)	(-0.85)	(-0.62)	(-1.46)	(-1.63)	(-0.25)
Disaster, t-5	0.11	0.93	-0.27	-0.13	-0.01	0.01	-0.01	-0.02	0.31**	0.01	0.02	0.06
	(0.50)	(1.36)	(-0.95)	(-0.84)	(-0.32)	(0.10)	(-0.03)	(-0.27)	(2.11)	(0.19)	(0.24)	(1.48)
Disaster, t-6	0.05	-0.24	-0.37	0.22	-0.03	0.22	-0.32	0.21	-0.04	-0.05	-0.05	0.01
	(0.42)	(-0.31)	(-0.78)	(0.54)	(-0.55)	(1.51)	(-0.68)	(1.01)	(-0.32)	(-1.42)	(-0.43)	(0.11)
Disaster, t-7	0.12	-0.69	-0.13	-0.12	0.05**	-0.17	0.24	-0.04	-0.16	-0.07	-0.01	-0.04
	(0.52)	(-1.38)	(-0.38)	(-0.76)	(2.02)	(-0.47)	(0.73)	(-0.34)	(-0.89)	(-1.10)	(-0.13)	(-0.75)
Disaster, t-8	-0.07	1.29*	-0.58	0.19	0.05	-0.03	0.25	-0.08	-0.13	-0.02	-0.10	0.11**
	(-0.81)	(1.94)	(-1.44)	(0.80)	(1.31)	(-0.43)	(0.64)	(-1.00)	(-1.45)	(-0.26)	(-1.03)	(2.40)
Disaster, t-9	-0.13	-0.28	-0.30	0.22	-0.02	0.22	0.29	-0.18*	0.24	-0.03	-0.01	-0.07
	(-1.49)	(-1.14)	(-0.94)	(1.19)	(-0.37)	(1.57)	(1.13)	(-1.92)	(0.98)	(-0.25)	(-0.06)	(-1.25)
Disaster, t-10	-0.20	0.07	-0.41	0.03	0.02	0.10	0.16	-0.28	-0.10	-0.02	-0.42	-0.04
	(-1.38)	(0.25)	(-1.20)	(0.21)	(0.42)	(0.90)	(0.55)	(-1.10)	(-0.56)	(-0.40)	(-1.40)	(-1.57)
Disaster, t-11	0.06	-0.06	0.10	0.15	-0.07**	0.12	-0.41***	-0.07	-0.22	-0.05	0.02	0.03
	(0.84)	(-0.22)	(0.31)	(0.97)	(-2.01)	(1.13)	(-2.76)	(-0.80)	(-0.97)	(-1.32)	(0.22)	(0.94)
Disaster, t-12	0.02	-0.04	-1.99	0.01	-0.06**	-0.05	0.37	-0.08	0.08	-0.01	0.00	-0.07**
	(0.19)	(-0.30)	(-1.48)	(0.07)	(-2.14)	(-0.29)	(1.03)	(-1.07)	(0.43)	(-0.10)	(0.05)	(-2.23)
Dep. var., t-1 to t-12	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Change in Import Prices, t-1	-25.63	79.36*	-26.31	-41.84	4.41	-80.01	34.81	29.62*	13.49	-21.62	-6.16	5.94
	(-1.57)	(1.78)	(-0.55)	(-1.27)	(0.87)	(-0.95)	(0.79)	(1.70)	(0.46)	(-1.22)	(-0.66)	(0.87)
Unemployment, t-1	-0.01	0.01	-0.05***	-0.01	-0.01*	0.01	-0.00	-0.01	0.00	0.00	-0.02***	-0.01
	(-1.44)	(0.64)	(-3.62)	(-1.41)	(-1.93)	(0.79)	(-0.08)	(-1.15)	(0.48)	(0.06)	(-2.70)	(-1.19)
Change in Nom. Exch. Rate (USD), t-1	1.16	-8.14*	9.29	11.56**	-0.75	7.29	-1.48	-5.08**	-3.30	-1.64	-0.81	-0.88
	(0.53)	(-1.97)	(1.48)	(2.51)	(-1.14)	(1.03)	(-0.27)	(-2.15)	(-0.89)	(-0.44)	(-0.64)	(-1.14)
Change in Oil Prices, t-1	-0.13	0.60	1.29*	4.32***	0.12	-0.71	6.60***	-0.21	-0.82	-0.32	-0.19	0.06
	(-0.32)	(0.70)	(1.73)	(4.68)	(1.10)	(-1.13)	(4.38)	(-0.49)	(-1.46)	(-0.91)	(-0.61)	(0.36)
Observations	192	192	192	192	192	192	192	192	192	192	192	192
Degrees of freedom	29	29	29	29	29	29	29	29	29	29	29	29

t statistics in parentheses
$^{*}\ p < 0.1,\ ^{**}\ p < 0.05,\ ^{***}\ p < 0.01$

FoodBev: food and non-alcoholic beverages; *AlcTob*: alcoholic beverages, tobacco and narcotics; *ClothShoes*: clothing and footwear; *HoEIG*: housing, water, electricity, gas and other fuels; *HoEq*: furnishings, household equipment and routine household maintenance; *Health*: health; *Transp*: transport; *Comm*: communications; *RecrCult*: recreation and culture; *Educ*: education; *RestHot*: restaurants and hotels; *Misc*: miscellaneous goods and services.

Table 17: Determinants of inflation of food and beverages' sub-categories, France, 1996-2021

	Food	BreadCer	Meat	FishSeaf	MilkChEg	OilsFa	Fruit	Veg	SugJHChC	Fonec	NAlcBev	CofTC	MWSJu
Disaster, t	0.06*	0.03***	0.03	0.17	0.03	-0.00	0.18	0.06	0.00	0.00	-0.02	0.01	-0.03
	(1.87)	(2.98)	(1.45)	(1.46)	(1.24)	(-0.15)	(0.40)	(0.38)	(0.13)	(0.18)	(-1.27)	(0.75)	(-1.32)
Disaster, t-1	0.03	0.06***	-0.00	0.01	0.03	-0.05***	-0.48**	0.34	0.03*	0.03*	0.02	-0.00	0.03
	(0.51)	(4.07)	(-0.18)	(0.15)	(0.91)	(-2.62)	(-2.08)	(0.39)	(1.96)	(1.85)	(1.17)	(-0.30)	(1.26)
Disaster, t-2	-0.02	-0.01	0.02	0.09**	-0.03	0.00	-0.15	-0.20	-0.01	-0.02	0.04***	0.08***	0.02
	(-0.28)	(-0.18)	(0.84)	(2.05)	(-1.56)	(0.04)	(-1.35)	(-0.56)	(-0.86)	(-0.54)	(4.09)	(2.81)	(1.13)
Disaster, t-3	-0.02	-0.01	-0.02	0.05	-0.00	-0.00	-0.01	-0.26**	-0.02	-0.01	0.05***	0.07***	0.05***
	(-1.00)	(-0.64)	(-1.17)	(0.89)	(-0.14)	(-0.19)	(-0.04)	(-2.31)	(-1.10)	(-0.80)	(4.13)	(2.90)	(3.89)
Disaster, t-4	0.03	0.00	0.01	-0.04	-0.02	-0.04**	0.46	-0.13	0.00	0.04**	-0.02	-0.00	-0.03
	(0.43)	(0.18)	(0.32)	(-0.62)	(-1.21)	(-2.25)	(1.36)	(-0.39)	(0.22)	(2.15)	(-0.94)	(-0.21)	(-0.91)
Disaster, t-5	0.01	-0.00	0.03**	0.04	0.04*	0.02	-0.36**	0.07	0.02	-0.03	0.01	-0.01	0.02
	(0.43)	(-0.33)	(2.03)	(0.43)	(1.90)	(1.20)	(-2.38)	(0.39)	(0.93)	(-1.35)	(1.24)	(-0.52)	(1.38)
Disaster, t-6	-0.05	0.01	0.00	-0.07	-0.01	-0.05**	0.35	-0.55*	0.01	0.01	-0.03**	-0.03	-0.02
	(-0.70)	(0.72)	(0.11)	(-0.64)	(-0.42)	(-2.09)	(1.34)	(-1.67)	(0.50)	(0.21)	(-2.51)	(-1.04)	(-1.28)
Disaster, t-7	0.03	-0.00	0.05***	0.10***	0.01	-0.01	-0.30	0.20	0.03*	0.03***	-0.03**	-0.07***	-0.01
	(0.78)	(-0.20)	(3.10)	(2.70)	(0.27)	(-0.64)	(-1.47)	(1.36)	(1.85)	(2.60)	(-1.98)	(-4.11)	(-0.39)
Disaster, t-8	0.01	0.00	-0.03	0.03	0.00	0.01	0.29	-0.10	0.00	-0.01	-0.02	-0.02*	0.00
	(0.34)	(0.20)	(-0.87)	(0.69)	(0.10)	(0.57)	(1.06)	(-0.40)	(0.34)	(-0.54)	(-1.29)	(-1.90)	(0.23)
Disaster, t-9	0.07**	0.00	-0.01	-0.04	-0.00	0.01	0.50*	0.30	-0.05**	-0.02	0.01	0.01	0.01
	(1.99)	(0.10)	(-0.38)	(-0.52)	(-0.03)	(0.26)	(1.69)	(1.59)	(-2.47)	(-1.10)	(0.45)	(0.41)	(0.35)
Disaster, t-10	0.01	0.02	0.00	0.04	0.08***	0.07*	-0.46**	-0.01	0.01	0.00	0.00	0.05**	-0.02
	(0.37)	(1.63)	(0.19)	(0.95)	(2.68)	(1.81)	(-2.04)	(-0.03)	(0.48)	(0.07)	(0.08)	(2.01)	(-0.99)
Disaster, t-11	-0.03	0.02***	0.02	0.13*	-0.02	-0.00	-0.30	-0.41	0.04***	0.00	0.05***	0.04	0.06***
	(-0.32)	(3.09)	(1.56)	(1.67)	(-1.03)	(-0.11)	(-0.53)	(-0.91)	(3.32)	(0.09)	(3.62)	(1.58)	(2.76)
Disaster, t-12	-0.08	0.01	0.05**	0.01	-0.01	-0.01	-0.74	-0.45	-0.04**	-0.02	-0.02	-0.01	-0.02
	(-0.94)	(0.83)	(2.28)	(0.29)	(-0.34)	(-0.56)	(-0.92)	(-1.23)	(-2.16)	(-0.97)	(-0.95)	(-1.00)	(-0.89)
Dep. var., t-1 to t-12	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Change in Import Prices, t-1	13.12	2.37	4.30	12.21	1.77	-2.43	71.90	62.32	-3.98	-1.58	0.70	0.65	3.13
	(1.18)	(0.98)	(1.21)	(0.96)	(0.31)	(-0.47)	(1.34)	(0.95)	(-1.65)	(-0.37)	(0.21)	(0.17)	(0.74)
Unemployment, t-1	-0.06	-0.03	-0.01	-0.01	-0.03	-0.02	-0.32	-0.23	-0.02	-0.03	-0.03*	-0.02	-0.04*
	(-1.36)	(-1.14)	(-0.53)	(-0.20)	(-1.11)	(-0.53)	(-1.30)	(-1.22)	(-1.24)	(-1.54)	(-1.73)	(-1.04)	(-1.82)
Change in Nom. Exch. Rate (USD), t-1	-0.80	-1.28**	-0.41	-0.88	-0.88	-0.97	8.32	4.03	-0.03	0.96	-1.21*	-1.56	-1.18
	(-0.49)	(-2.03)	(-0.45)	(-0.27)	(-1.01)	(-0.93)	(0.71)	(0.46)	(-0.05)	(1.23)	(-1.79)	(-1.57)	(-1.40)
Change in Oil Prices, t-1	-0.58	-0.30	-0.12	-1.36	0.10	0.27	-1.37	-3.33	-0.09	0.15	0.11	0.26	0.10
	(-1.08)	(-1.10)	(-0.64)	(-1.24)	(0.46)	(1.47)	(-0.52)	(-1.22)	(-0.51)	(0.81)	(0.72)	(1.14)	(0.56)
Observations	264	264	264	264	264	264	264	264	264	264	264	264	264
Degrees of freedom	29	29	29	29	29	29	29	29	29	29	29	29	29

t statistics in parentheses
$^{*}\ p < 0.1,\ ^{**}\ p < 0.05,\ ^{***}\ p < 0.01$

Food: food; *BreadCer*: bread and cereals; *Meat*: meat; *FishSeaf*: fish and seafood; *MilkChEg*: milk, cheese and eggs; *OilsFa*: oils and fats; *Fruit*: fruit; *Veg*: vegetables; *SugJHChC*: sugar, jam, honey, chocolate and confectionery; *Fonec*: Food products n.e.c.; *NAlcBev*: Non-alcoholic beverages; CofTC: coffee, tea and cocoa; *MWSJu*: Mineral waters, soft drinks, fruit and vegetable juices.

Table 18: Determinants of inflation of food and beverages' sub-categories, Germany, 1996-2021

	Food	BreadCer	Meat	FishSeaf	MilkChEg	OilsFa	Fruit	Veg	SugJHChC	Fonec	NAlcBev	CofTC	MWSJu
Disaster, t	0.01	0.02	0.01	0.00	-0.00	0.11	-0.07	-0.02	0.04	-0.02	-0.03	-0.12	0.01
	(0.06)	(0.83)	(0.23)	(0.01)	(-0.00)	(0.38)	(-0.31)	(-0.03)	(1.25)	(-1.23)	(-0.52)	(-0.66)	(0.53)
Disaster, t-1	0.05	-0.03***	-0.05	0.00	0.04	-0.02	0.11	0.30	0.02	0.04	-0.00	0.11	-0.04*
	(1.23)	(-2.64)	(-1.01)	(0.06)	(0.96)	(-0.28)	(0.41)	(1.01)	(0.83)	(1.03)	(-0.08)	(1.01)	(-1.85)
Disaster, t-2	-0.05	-0.05***	0.00	-0.02	-0.03	0.11	0.02	-0.22	0.10	-0.04	-0.01	-0.01	-0.02
	(-0.87)	(-3.20)	(0.02)	(-0.47)	(-0.96)	(1.14)	(0.16)	(-0.75)	(1.39)	(-1.43)	(-0.31)	(-0.17)	(-0.71)
Disaster, t-3	-0.17**	0.00	0.00	0.05	-0.03	-0.04	-0.42**	-0.97***	-0.05	-0.00	-0.04	-0.09	-0.03
	(-2.22)	(0.04)	(0.11)	(1.40)	(-0.56)	(-0.43)	(-2.43)	(-3.83)	(-0.99)	(-0.29)	(-1.37)	(-1.15)	(-1.00)
Disaster, t-4	-0.05	0.03**	-0.03	-0.06*	0.05	0.05	-0.18	-0.58	-0.04*	-0.03	-0.05**	-0.07	-0.02
	(-0.93)	(2.16)	(-0.95)	(-1.83)	(1.51)	(0.61)	(-1.52)	(-1.57)	(-1.73)	(-1.31)	(-2.07)	(-1.21)	(-1.17)
Disaster, t-5	0.07	-0.02	-0.04**	-0.12	0.07	0.17	0.23	0.09	-0.00	0.02**	-0.02	-0.06*	0.02
	(1.35)	(-0.91)	(-2.58)	(-1.43)	(0.53)	(0.61)	(1.04)	(0.47)	(-0.10)	(2.04)	(-0.56)	(-1.77)	(0.49)
Disaster, t-6	-0.00	-0.01	-0.01	0.01	0.09	-0.08	-0.25	0.11	0.15***	0.03	-0.03	0.00	-0.06***
	(-0.03)	(-0.63)	(-0.76)	(0.35)	(0.76)	(-0.93)	(-1.13)	(0.39)	(3.15)	(1.53)	(-0.75)	(0.04)	(-2.70)
Disaster, t-7	0.08	-0.03*	0.03	-0.11*	-0.02	-0.21	-0.09	0.88**	0.04	0.02	-0.06	-0.12	-0.06*
	(1.33)	(-1.84)	(1.23)	(-1.74)	(-0.32)	(-1.50)	(-0.70)	(2.14)	(0.50)	(0.77)	(-1.19)	(-1.03)	(-1.92)
Disaster, t-8	-0.02	-0.02	-0.04**	0.04	0.00	-0.15	-0.03	0.06	0.01	-0.01	-0.00	-0.06	0.03
	(-0.59)	(-1.16)	(-2.05)	(0.49)	(0.04)	(-1.30)	(-0.21)	(0.25)	(0.17)	(-0.32)	(-0.00)	(-0.53)	(1.47)
Disaster, t-9	-0.06	-0.01	-0.03*	0.02	-0.04	0.06	0.02	-0.36	-0.04	0.00	0.05	0.21**	-0.02
	(-1.01)	(-1.20)	(-1.91)	(0.43)	(-0.92)	(0.62)	(0.14)	(-1.25)	(-0.95)	(0.16)	(1.43)	(2.04)	(-1.36)
Disaster, t-10	-0.05	0.03**	-0.04	-0.14***	-0.06**	-0.27*	0.24***	-0.17	-0.04	-0.01	-0.05**	-0.08	-0.04**
	(-0.46)	(2.08)	(-1.40)	(-4.76)	(-2.07)	(-1.88)	(2.90)	(-0.31)	(-0.89)	(-0.35)	(-2.15)	(-0.87)	(-2.01)
Disaster, t-11	-0.05	-0.01	-0.00	0.02	-0.00	-0.16	-0.00	-0.41*	-0.04	-0.03	-0.03	-0.07	0.01
	(-1.53)	(-0.54)	(-0.06)	(0.19)	(-0.02)	(-1.11)	(-0.02)	(-1.84)	(-0.99)	(-1.02)	(-0.59)	(-0.52)	(0.46)
Disaster, t-12	-0.10***	-0.00	-0.00	0.04	0.02	0.02	-0.62***	-0.48	0.07	0.05	0.13**	0.30	0.04**
	(-3.08)	(-0.37)	(-0.06)	(1.15)	(0.41)	(0.28)	(-4.81)	(-1.50)	(1.34)	(1.50)	(2.18)	(1.63)	(2.04)
Dep. var., t-1 to t-12	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Change in Import Prices, t-1	4.41	5.39	5.29	-0.11	-11.63	-100.54*	43.34	-0.85	5.75	-4.51	-1.95	-3.63	7.69
	(0.28)	(0.76)	(0.31)	(-0.01)	(-0.43)	(-1.84)	(0.81)	(-0.01)	(0.46)	(-0.72)	(-0.15)	(-0.13)	(0.59)
Unemployment, t-1	-0.01	-0.00	-0.01	0.01	-0.02	-0.03	-0.02	-0.05	-0.00	-0.01	-0.00	0.01	-0.01
	(-0.85)	(-0.25)	(-1.28)	(0.44)	(-0.74)	(-0.87)	(-0.32)	(-0.59)	(-0.16)	(-0.73)	(-0.05)	(0.30)	(-0.52)
Change in Nom. Exch. Rate (USD), t-1	-2.85	-1.37	-1.43	-2.07	-1.01	2.88	-6.39	1.95	-0.91	0.67	-0.81	2.53	-3.06
	(-1.21)	(-1.48)	(-0.78)	(-0.85)	(-0.26)	(0.45)	(-0.87)	(0.15)	(-0.62)	(0.76)	(-0.40)	(0.62)	(-1.55)
Change in Oil Prices, t-1	-0.72*	-0.14	-0.12	-0.63	-0.09	-0.03	-0.63	-2.93*	-0.27	-0.15	0.20	0.25	0.27
	(-1.88)	(-0.56)	(-0.40)	(-1.48)	(-0.16)	(-0.04)	(-0.57)	(-1.71)	(-0.68)	(-0.72)	(0.52)	(0.39)	(0.81)
Observations	289	289	289	289	289	289	289	289	289	289	289	289	289
Degrees of freedom	29	29	29	29	29	29	29	29	29	29	29	29	29

t statistics in parentheses
$^{*}\ p < 0.1,\ ^{**}\ p < 0.05,\ ^{***}\ p < 0.01$

Food: food; *BreadCer*: bread and cereals; *Meat*: meat; *FishSeaf*: fish and seafood; *MilkChEg*: milk, cheese and eggs; *OilsFa*: oils and fats; *Fruit*: fruit; *Veg*: vegetables; *SugJHChC*: sugar, jam, honey, chocolate and confectionery; *Fonec*: Food products n.e.c.; *NAlcBev*: Non-alcoholic beverages; CofTC: coffee, tea and cocoa; *MWSJu*: Mineral waters, soft drinks, fruit and vegetable juices.

Table 19: Determinants of inflation of food and beverages' sub-categories, Italy, 1996-2021

	Food	BreadCer	Meat	FishSeaf	MilkChEg	OilsFa	Fruit	Veg	SugJHChC	Fonec	NAlcBev	CofTC	MWSJu
Disaster, t	0.02	0.01	-0.02**	0.03**	-0.03**	-0.05*	0.04	-0.05	0.03	-0.02	-0.02	-0.02	-0.01
	(0.68)	(0.83)	(-2.03)	(2.39)	(-2.39)	(-1.86)	(0.31)	(-0.73)	(1.65)	(-0.74)	(-0.94)	(-0.69)	(-0.49)
Disaster, t-1	0.06*	-0.01	0.02	0.01	0.02	0.02	0.59***	0.08	0.00	-0.02	-0.02	-0.09***	0.04***
	(1.84)	(-1.16)	(1.30)	(0.51)	(1.17)	(1.00)	(3.64)	(0.94)	(0.09)	(-0.86)	(-1.51)	(-5.01)	(2.99)
Disaster, t-2	-0.10***	-0.00	0.01	-0.02	-0.02**	-0.01	-0.22**	-0.30***	0.01	0.03	-0.02	0.04**	-0.04**
	(-3.55)	(-0.18)	(0.56)	(-1.00)	(-2.60)	(-0.61)	(-2.35)	(-5.04)	(0.78)	(1.55)	(-1.28)	(2.23)	(-1.99)
Disaster, t-3	0.06**	0.03*	0.04***	-0.03	0.03**	0.00	0.09	0.29**	-0.01	0.00	0.07***	0.01	0.08***
	(2.09)	(1.68)	(4.51)	(-1.45)	(2.13)	(0.07)	(0.90)	(2.25)	(-0.90)	(0.03)	(5.45)	(0.95)	(5.78)
Disaster, t-4	0.05***	-0.01	0.00	-0.01	-0.00	-0.02	0.16	0.30***	0.01	0.02	0.02	0.02	0.06***
	(2.64)	(-0.48)	(0.37)	(-1.18)	(-0.36)	(-0.96)	(1.52)	(3.79)	(1.18)	(1.34)	(1.10)	(0.77)	(3.80)
Disaster, t-5	0.07	0.02*	0.01	-0.05***	0.02	0.05**	0.22	0.15	0.02*	-0.01	0.00	-0.03	0.02
	(1.21)	(1.67)	(0.75)	(-3.34)	(0.95)	(2.59)	(1.50)	(0.46)	(1.89)	(-0.54)	(0.14)	(-1.12)	(0.66)
Disaster, t-6	0.03	-0.00	0.02	0.00	0.00	0.00	-0.04	0.21	0.02	0.01	-0.01	0.02	-0.02
	(0.60)	(-0.02)	(1.60)	(0.11)	(0.04)	(0.11)	(-0.35)	(0.55)	(1.61)	(0.73)	(-0.44)	(0.44)	(-0.74)
Disaster, t-7	-0.01	-0.01	-0.00	-0.02	-0.01	0.03	0.13	0.04	0.02	-0.00	-0.00	-0.02	0.01
	(-0.24)	(-0.68)	(-0.35)	(-0.68)	(-0.54)	(1.15)	(1.15)	(0.10)	(1.60)	(-0.10)	(-0.23)	(-0.57)	(0.28)
Disaster, t-8	0.06	0.01	-0.02	-0.03	-0.01	-0.01	0.15*	0.48***	-0.03**	0.02	0.02	0.05**	0.01
	(1.49)	(0.40)	(-0.81)	(-1.26)	(-0.33)	(-0.40)	(1.73)	(3.98)	(-2.20)	(0.89)	(0.86)	(2.31)	(0.46)
Disaster, t-9	-0.03	0.04	-0.00	0.02	0.00	0.07***	-0.03	-0.18	0.02**	0.02**	0.02	-0.02	0.05***
	(-1.07)	(1.48)	(-0.04)	(0.54)	(0.01)	(3.37)	(-0.29)	(-1.55)	(2.23)	(2.11)	(0.97)	(-0.63)	(3.08)
Disaster, t-10	-0.00	-0.04***	-0.04***	0.03**	-0.02*	-0.04	-0.05	0.18**	0.03***	-0.01	-0.02	-0.01	-0.04**
	(-0.13)	(-3.00)	(-4.02)	(2.14)	(-1.88)	(-1.37)	(-0.24)	(2.29)	(3.52)	(-0.73)	(-1.54)	(-0.30)	(-2.01)
Disaster, t-11	0.04	0.02	0.03**	0.06***	0.01	0.02	0.20*	0.06	-0.00	0.02	-0.00	0.02	-0.00
	(1.08)	(1.42)	(2.52)	(3.44)	(0.28)	(0.55)	(1.78)	(0.63)	(-0.12)	(0.94)	(-0.24)	(0.89)	(-0.13)
Disaster, t-12	0.05**	-0.00	0.03**	-0.04***	0.01	0.00	0.10	0.24***	0.03	0.03	0.01	0.03	0.01
	(2.15)	(-0.05)	(2.58)	(-3.15)	(0.24)	(0.15)	(0.79)	(3.19)	(1.07)	(1.32)	(0.97)	(1.60)	(0.48)
Dep. var., t-1 to t-12	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Change in Import Prices, t-1	-10.30	-0.30	2.42	-8.43	6.12	13.54	-84.97	24.38	-3.63	1.85	6.19	-0.19	9.37
	(-1.16)	(-0.05)	(0.64)	(-1.40)	(1.14)	(0.93)	(-1.38)	(0.70)	(-0.77)	(0.36)	(0.88)	(-0.02)	(1.28)
Unemployment, t-1	-0.05***	-0.03**	-0.03**	-0.03**	-0.01	-0.00	-0.07	-0.06	-0.03***	-0.04***	-0.02**	-0.02	-0.02**
	(-2.66)	(-2.37)	(-2.39)	(-2.11)	(-1.51)	(-0.01)	(-1.17)	(-0.81)	(-2.79)	(-3.53)	(-2.06)	(-1.60)	(-2.19)
Change in Nom. Exch. Rate (USD), t-1	0.61	-1.09	-1.08	-0.85	-1.85*	-1.08	0.79	1.30	1.67**	0.37	-0.15	0.05	-1.26
	(0.35)	(-1.24)	(-1.65)	(-0.66)	(-1.86)	(-0.59)	(0.13)	(0.18)	(2.12)	(0.32)	(-0.14)	(0.04)	(-1.08)
Change in Oil Prices, t-1	-0.55	-0.38	-0.07	-0.13	-0.32	-0.31	-1.60	-1.92	-0.23	-0.64**	-0.29	-0.44	-0.40
	(-1.06)	(-1.39)	(-0.42)	(-0.46)	(-1.37)	(-0.59)	(-1.06)	(-1.02)	(-1.05)	(-2.17)	(-1.13)	(-1.33)	(-1.48)
Observations	192	192	192	192	192	192	192	192	192	192	192	192	192
Degrees of freedom	29	29	29	29	29	29	29	29	29	29	29	29	29

t statistics in parentheses
$^{*}\ p < 0.1,\ ^{**}\ p < 0.05,\ ^{***}\ p < 0.01$

Food: food; *BreadCer*: bread and cereals; *Meat*: meat; *FishSeaf*: fish and seafood; *MilkChEg*: milk, cheese and eggs; *OilsFa*: oils and fats; *Fruit*: fruit; *Veg*: vegetables; *SugJHChC*: sugar, jam, honey, chocolate and confectionery; *Fonec*: Food products n.e.c.; *NAlcBev*: Non-alcoholic beverages; CofTC: coffee, tea and cocoa; *MWSJu*: Mineral waters, soft drinks, fruit and vegetable juices.

Table 20: Determinants of inflation of food and beverages' sub-categories, Spain, 1996-2021

	Food	BreadCer	Meat	FishSeaf	MilkChEg	OilsFa	Fruit	Veg	SugJHChC	Fonec	NAlcBev	CofTC	MWSJu
Disaster, t	-0.12	-0.23**	-0.13	0.00	-0.31*	-1.18***	-0.25	0.25	0.10*	-0.09	0.48	0.06	0.67
	(-1.04)	(-2.19)	(-1.26)	(0.01)	(-1.66)	(-2.69)	(-0.65)	(0.52)	(1.76)	(-0.84)	(1.18)	(0.26)	(1.13)
Disaster, t-1	0.11	-0.04	0.03	0.12	-0.05	0.65	1.14	-0.19	-0.15	-0.16***	0.08	-0.20	0.16
	(0.65)	(-0.44)	(0.31)	(0.55)	(-0.39)	(1.57)	(1.16)	(-0.39)	(-1.46)	(-3.18)	(0.73)	(-1.59)	(1.19)
Disaster, t-2	-0.21*	-0.19*	-0.14	-0.33	-0.23**	0.64**	0.03	-0.06	-0.26***	-0.23***	-0.05	0.06	-0.06
	(-1.69)	(-1.91)	(-1.40)	(-0.84)	(-2.20)	(2.06)	(0.10)	(-0.15)	(-2.61)	(-4.81)	(-0.53)	(0.74)	(-0.68)
Disaster, t-3	-0.11	-0.12*	-0.02	-0.01	-0.18	0.18	-0.17	0.34	-0.12	-0.11	-0.22*	-0.36***	-0.21
	(-1.27)	(-1.82)	(-0.15)	(-0.07)	(-1.36)	(0.37)	(-0.62)	(1.20)	(-1.37)	(-1.29)	(-1.68)	(-4.15)	(-1.21)
Disaster, t-4	0.01	0.07	-0.02	0.26	-0.12	1.09	-0.33	-0.13	0.09	-0.03	-0.19*	-0.06	-0.17*
	(0.05)	(1.11)	(-0.12)	(0.55)	(-0.50)	(1.28)	(-0.97)	(-0.74)	(1.23)	(-0.53)	(-1.73)	(-0.37)	(-1.83)
Disaster, t-5	0.10	0.12	0.20	-0.24	0.19	0.35	-0.07	-0.44	0.06	0.16**	0.06	-0.06	0.06
	(0.43)	(1.00)	(1.57)	(-0.37)	(0.95)	(0.39)	(-0.20)	(-1.57)	(0.61)	(2.58)	(0.38)	(-0.87)	(0.30)
Disaster, t-6	0.06	0.21	0.01	0.26	-0.06	0.06	-0.34	-0.15	0.02	-0.00	0.14	0.12	0.16
	(0.44)	(1.46)	(0.14)	(0.79)	(-0.28)	(0.16)	(-1.06)	(-0.55)	(0.23)	(-0.04)	(0.78)	(1.07)	(0.96)
Disaster, t-7	0.11	-0.03	0.04	0.04	-0.13	0.28	0.43	0.30	-0.01	0.13	0.12	0.25	0.18**
	(0.46)	(-0.32)	(0.33)	(0.12)	(-0.83)	(1.15)	(0.45)	(0.39)	(-0.05)	(1.00)	(1.38)	(0.99)	(2.12)
Disaster, t-8	-0.07	-0.06	-0.32**	0.06	-0.26	0.63	0.30	-1.02*	0.08	-0.07	-0.09	0.11	-0.08
	(-0.71)	(-1.44)	(-2.29)	(0.13)	(-1.37)	(1.04)	(0.41)	(-1.85)	(1.10)	(-1.42)	(-0.55)	(0.87)	(-0.36)
Disaster, t-9	-0.12	-0.14	-0.13*	-0.05	-0.18	0.36	-0.43	-0.25	-0.06	-0.11	-0.31***	-0.22	-0.31**
	(-1.31)	(-1.35)	(-1.89)	(-0.25)	(-1.46)	(0.35)	(-1.05)	(-0.84)	(-0.39)	(-1.52)	(-3.43)	(-1.03)	(-2.22)
Disaster, t-10	-0.22	-0.19**	0.10	-0.37**	-0.14	-0.69**	-0.42	0.02	-0.07	-0.07	-0.01	-0.08	0.03
	(-1.48)	(-2.38)	(0.63)	(-2.12)	(-1.10)	(-2.34)	(-0.90)	(0.04)	(-0.77)	(-0.49)	(-0.08)	(-0.59)	(0.20)
Disaster, t-11	0.07	-0.11**	0.15	0.09	0.02	0.14	0.41	-0.33	-0.04	0.11	-0.04	0.04	-0.09
	(0.93)	(-2.16)	(1.21)	(0.62)	(0.07)	(0.45)	(0.65)	(-0.81)	(-0.51)	(1.43)	(-0.47)	(0.27)	(-0.94)
Disaster, t-12	0.04	-0.12**	0.02	-0.21	-0.04	-0.54	-0.09	1.01	0.02	-0.20*	-0.22	-0.13	-0.25
	(0.32)	(-2.24)	(0.13)	(-1.12)	(-0.21)	(-1.63)	(-0.21)	(1.53)	(0.35)	(-1.88)	(-1.04)	(-0.93)	(-0.82)
Dep. var., t-1 to t-12	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Change in Import Prices, t-1	-27.68	8.36	-8.24	-67.00**	6.05	-7.64	-127.00	-34.46	20.17	14.11	-0.56	12.53	-9.93
	(-1.62)	(1.07)	(-0.65)	(-2.10)	(0.32)	(-0.15)	(-1.34)	(-0.42)	(1.30)	(1.64)	(-0.04)	(0.58)	(-0.50)
Unemployment, t-1	-0.01	-0.01**	-0.01**	-0.00	-0.02	0.02	-0.03	-0.04	-0.01	-0.01**	-0.01**	-0.01	-0.01
	(-1.40)	(-2.28)	(-2.25)	(-0.27)	(-1.47)	(1.06)	(-0.55)	(-1.60)	(-1.46)	(-2.24)	(-2.12)	(-1.28)	(-1.37)
Change in Nom. Exch. Rate (USD), t-1	1.42	-2.10*	-0.36	4.92	-3.28	-3.66	14.94	4.91	-1.41	-1.97	-2.05	-0.68	-1.88
	(0.62)	(-1.78)	(-0.24)	(1.37)	(-1.16)	(-0.56)	(1.18)	(0.54)	(-0.94)	(-1.41)	(-0.97)	(-0.25)	(-0.68)
Change in Oil Prices, t-1	-0.13	-0.17	-0.04	0.71	-0.24	-1.31	-0.80	-2.09	0.55**	0.03	0.17	0.57	0.13
	(-0.30)	(-0.86)	(-0.17)	(0.82)	(-0.73)	(-1.12)	(-0.32)	(-1.27)	(2.19)	(0.09)	(0.39)	(1.42)	(0.22)
Observations	192	192	192	192	192	192	192	192	192	192	192	192	192
Degrees of freedom	29	29	29	29	29	29	29	29	29	29	29	29	29

t statistics in parentheses
$^{*}\ p < 0.1$, $^{**}\ p < 0.05$, $^{***}\ p < 0.01$

Food: food; *BreadCer*: bread and cereals; *Meat*: meat; *FishSeaf*: fish and seafood; *MilkChEg*: milk, cheese and eggs; *OilsFa*: oils and fats; *Fruit*: fruit; *Veg*: vegetables; *SugJHChC*: sugar, jam, honey, chocolate and confectionery; *Fonec*: Food products n.e.c.; *NAlcBev*: Non-alcoholic beverages; CofTC: coffee, tea and cocoa; *MWSJu*: Mineral waters, soft drinks, fruit and vegetable juices.