

Why you can't forecast inflation without considering climate change



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Climate change matters for inflation. The combined effect of the ongoing transition to lower CO₂/greenhouse gas emissions and the direct impact of climate change is one of several likely-to-linger upside pressures for inflation. Recent European energy security issues, following the loss of Russian gas, have the potential to speed up the policy impetus behind transition to lower-emission sources of energy and potentially bringing forward some elements of transition cost. In the US, this year's somewhat controversially named Inflation Reduction Act also took policy steps that can help incentivise spending related to transition (including through tax credits).

“ **There are multiple channels through which climate change can affect inflation** ”

Even if they prove difficult to disentangle from other factors in practice, making it more likely to be a recurrent driver of inflation over coming years. Those channels include transition costs and the impact of extreme weather on commodity prices, food security, supply chains and productivity.

Some of these impacts on inflation are likely to be stronger in the near term, the faster the transition to a lower carbon emission environment (in the absence of technological breakthroughs that quickly lower the cost of transition). However, delayed transmission also seems set to worsen some impacts on inflation in future years (and before considering the broader impact on economies and wellbeing).

Climate change-related factors may both keep inflation on average higher than it would otherwise be, but also more volatile. That volatility itself could also have implications for central bank decision making, the length of business cycles and asset prices.

Ultimately, I expect inflation targeting central banks to act to control inflation now and in the future. Climate change then is another reason why nominal interest rates may on average linger at higher levels than we'd become used to pre-pandemic.

Transition costs:

With policymakers and companies stepping up to address the challenges of climate change now, transitional economic consequences are being brought forward, including the costs involved with trying to lower emissions. Transitions costs that firms may pass on to end consumers could run from consultancy costs to renting newer, more expensive higher quality buildings that emit less, to costs associated with, for example, installing solar panels. Other transition costs may be less direct. Moving away from an over-reliance on nitrogen-based fertiliser for example (nitrous oxide is a potent greenhouse gas) may have spillover effects on food prices.

Weather effects – hot summers, food prices and how governments can make everything worse:

The [European Central Bank's \(ECB\) Schnabel](#) labelled the impact of natural disasters and extreme weather events on inflation as 'climateflation'. It isn't obvious though that these factors have to increase inflation. [ECB research](#) suggests that the largest impacts of extreme temperatures come from hot summers and work through food prices in particular. However, particularly for emerging markets, they found evidence of negative impacts on inflation in the medium term as supply disruption is followed by weak demand. Experience in developed markets might conceivably follow this pattern over the next year or so as cost-of-living pressures build on households and help push economies into recession (although only part of this year's high food and energy inflation relates to climate change).

The impact of weather-related shocks on global food prices can also be exacerbated by government policy, with authors of a [Bank of England working paper](#) highlighting the scenario of exporting countries resorting to protectionist measures to keep domestic food prices down, citing a 2010 ban on Russian grain exports after a drought and heatwave. More recently, for example, Indonesia temporarily banned palm oil exports, leading to a sharp increase in global palm oil prices. The ban followed a sharp rise in domestic cooking oil prices, partly stemming from Ukraine-related disruption but also from drought in South America that pushed up the price of soy beans (see [Wall Street Journal](#)).

There are also links between extreme weather and energy prices, where higher use of more weather-dependent renewable energy sources can combine with extreme weather to generate energy price volatility.

Commodity demand and supply mismatches:

The ECB's Schnabel also highlights a category of climate driven inflationary pressure, she calls 'greenflation'. The move to more green technologies increases the demand for certain metals and minerals, but near-term supply may be naturally constrained (it can take years to open a new mine). The price for those in-demand commodities then tends to rise.

I'd also argue that the supply of certain commodities could be constrained further by under-investment driven by broader ESG considerations where the mining/production process itself may generate considerable carbon emissions as well as having other implications, for example, biodiversity and the impact on communities, that make those investments less attractive (with potential support for some operations, where they are perceived as 'transitioning').

Climate change versus fossil fuel = inflation:

Over the period of transition to a lower-carbon intensive environment, the price of fossil fuels can rise, driven by several factors and adding strongly to consumer prices. This relates to what the ECB's Schnabel labelled 'fossilflation', reflecting the legacy cost of dependency on fossil fuel energy sources.

Climate change and transition can raise impact of fossil fuel dependency on inflation through factors including: 1) the price of carbon; 2) through the movement of institutional investors away from exposures to fossil fuel producers which, Schnabel argues has materially increased funding costs for fossil fuel producers and led to a "sluggish response of crude oil production in large parts of the world." I'd also argue that 3) periods of extreme weather may see demand spike fossil fuels as a source energy. This summer, for example, hot dry weather led to low river/reservoir levels, causing issues for nuclear plants in France and hydropower.

Higher prices for fossil fuels can raise consumer prices directly (petrol/diesel prices, gas central heating bills) or indirectly (via, for example, the continued use of fossil fuels in electricity generation; the impact of higher fossil fuel prices on fertiliser; or through the impact of higher fuel costs on transport). They still make up a large part of an average consumer spending basket. A faster transition focused more on energy efficiency could, however, lower the weight of fossil fuels in consumer baskets.

Productivity impact may worsen inflationary effects...

There are a number of channels through which climate change related issues could worsen labour productivity, increasing cost pressures for firms and supporting inflation. Environments of extreme heat for example aren't generally conducive to higher workplace output. A 2019 report from the International Labour Organization points out that temperatures exceeding 39°C can kill; that some groups of workers/types of jobs are more vulnerable than others; and that by 2030 the equivalent of more than 2% of total working hours worldwide is projected to be lost every year because it is "too hot to work" or because workers have to slow their pace. They argue that temperatures above 24-26°C are associated with reduced labour productivity and at 33-34°C, "a worker operating at moderate intensity loses 50% of their work capacity".

To an extent, business can help workers adapt through changes in workwear, through technology and through air conditioning provision for example. However, these solutions also come with short-term costs and air conditioning can add to emissions. Money may also be diverted away from more directly output-enhancing investments that could have taken place in the absence of climate change.

...so might wage growth

Transition to a lower emissions economy will likely mean less demand for some jobs and growing demand for others. Economies with less mobile workforces and that prove less able to help re-skill workers are likely to face more issues relating to skills shortages, boosting pay growth in certain sectors and leaving the labour market looking tight overall.

...so might trade relations

Work by the UN/National Institute of Economic and Social Research includes a scenario whereby a group of countries take measures to help lower global carbon emissions. They argue that a carbon tax imposed in a subset of major economies, but not coordinated globally could lead to a loss of competitiveness in those economies that they meet by imposing Carbon Border Adjustments (CBAs) – effectively an import tax on economies whose carbon emissions restrictions are more lax – and where that is then met by retaliatory

tariffs. That scenario looks more topical in light of EU discussions around BCAs where last year the European Council agreed at least a general approach on Carbon Border Adjustment Mechanism regulation.

Already high inflation regimes and less credible central banks make matters worse:

In a high inflation regime, with lower institutional credibility and higher inflation expectations, upside shocks, for example after an extreme weather event, are likely to propagate more. Central bank response functions – and the degree of effective central bank independence – will clearly matter in that context. To the extent that climate change means that upward shocks to inflation become more frequent, that itself could affect inflation expectations on a longer-term basis as households more frequently encounter high inflation in

“ It may prove difficult for central banks to ignore persistent upward price pressure from climate change factors ”

categories of products that are particularly observable to them (e.g. food).

One-off shocks to energy and food prices would be one thing, but recurrent climate change-related price shocks would be hard to look through and risk damaging central bank credibility and threaten to de-anchor inflation expectations.

Building on from that, as monetary policy responds to a higher inflation environment by dampening domestic demand, it may be nominal interest rates more than headline inflation that ends up lingering at higher levels than they would have otherwise.

Existing climate change scenario analysis points to potential inflation spikes:

Network for Greening the Financial System scenario work suggests a near-term inflation spike in Europe and the US if there is a sharp, immediate policy move to a net-zero environment. In the event of a delayed and disorderly transition, there is also an inflation spike on their modelling (of around 1pp in Europe and the US), but later in the profile. However, their scenarios also show that, at the long-term horizon, the stronger inflation impact happens under current policy settings

(with lower transition costs but higher physical risks from climate change.) However, they argue that the potential channels for climate change to affect inflation in their scenarios are limited in the models they use (working largely through carbon pricing, broader impacts on economic activity and productivity) and that more work is required.

Careful policy implementation is key:

With substantial climate change-related impacts on inflation at least plausible,

policymakers need to pay close attention to unintended consequences for prices resulting from climate policy action (or inaction).

“**Regulation cannot solve all climate-related issues and interest rates are a blunt tool to tackle any inflationary consequences.**”

Inflation spikes have the potential to elevate the importance of 'just transition' too.

Households in some parts of a country, or in some countries in particular may be more vulnerable to the physical effects of climate change, e.g. flooding and drought. However, the impacts via inflation could reach a broader range of economies and households and be liable to affect the poorest households more where energy and food prices will tend to form a larger proportion household spending.

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Issued in December 2022 by Royal London Asset Management Limited, 55 Gracechurch Street, London, EC3V 0RL. Authorised and regulated by the Financial Conduct Authority, firm reference number 141665. A subsidiary of The Royal London Mutual Insurance Society Limited.

Ref: AL RLAM PD 0157