

Inflation as a Fiscal Limit

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1 Summary

- **Inflation is back.** After two decades of low inflation, policymakers are newly confronted with a high bout of fast-growing prices. **Will inflation recede or persist?**
- The answer hinges on the **fiscal authority's credibility** in stabilizing a large fiscal imbalance. The central bank's anti-inflation reputation, albeit important, is not decisive.
 1. When the fiscal authority is not perceived as responsible for covering the existing fiscal imbalances, the private sector expects that inflation will rise to ensure sustainability of national debt.
 2. A large fiscal imbalance combined with a weakening fiscal credibility may lead trend inflation to drift away from the long-run target chosen by the monetary authority.
⇒ Trend inflation is fully controlled by the monetary authority only when public debt can be successfully stabilized by credible future fiscal plans.
- This reasoning configures **a natural limit on fiscal policy**. This limit takes the form of incompatibility between lax fiscal policy and a monetary framework aimed at achieving a low and stable inflation environment.
- When inflation has a fiscal nature, monetary tightening can spark a pernicious **fiscal stagflation**, with the inflation rate drifting away from the monetary authority's target and with GDP growth slowing down considerably.
- Fiscal stagflation stems from the progressive deterioration of the fiscal authority's credibility to stabilize its large debt and the realization that the reputation of the monetary authority is incompatible with the expected behavior of the fiscal authority.

- To substantiate these arguments, we build a model that allows for changes between a **Monetary-led** and a **Fiscally-led** policy mix, a zero lower bound regime, and **changes in agents' beliefs about the future policy mix** while at the zero lower bound.
- When we bring the model to the data, we find that
 1. Movements in trend inflation are explained by fiscal shocks and by changes in the policy mix. Cost-push shocks have only transitory effects.
 2. Following the ARPA, the probability of a return to the Fiscally-led regime has increased, helping the recovery, but also causing a jump in fiscal inflation.
 3. Monetary tightening alone would not have prevented the increase in inflation.

⇒ The risk of **persistent high inflation** stems from the combination of the large public debt and the weakening credibility of the fiscal framework. The recipe used to defeat the Great Inflation in the early 1980s might not be effective today.

⇒ **Conquering the post-pandemic inflation necessitates an overhaul of the fiscal framework** aimed at financing the large stock of government debt, as well as the expected increase in public expenditure.

2 A model of monetary/fiscal policy interaction

- We augment a prototypical New Keynesian model with:
 1. The possibility of changes in the policy mix when out of the zero lower bound:
 - (a) **Monetary-led policy mix:** The central bank is the leading authority, the response to inflation is strong. The fiscal authority stabilizes debt. **The macroeconomy is insulated from fiscal imbalances.**
 - (b) **Fiscally-led policy mix:** The fiscal authority is not fully committed to debt stabilization. The central bank accommodates the behavior of the fiscal authority. **The macroeconomy is not insulated from fiscal imbalances.**
 2. A **zero-lower-bound (ZLB)** regime triggered by a large adverse shock.
 3. **Changes in agents' beliefs about the probability of moving to the Fiscally-led policy mix after the zero lower bound regime.**
- To model changes in agents' beliefs at the ZLB, we introduce **two parameters** controlling the probability assigned to moving to the Monetary-led policy mix **before and after the ARPA shock:** P_{ZM}^M and P_{ZF}^M .
- **Beliefs, as captured by the probabilities of moving across regimes, affect the joint dynamics of fiscal and macroeconomic variables.**

3 Fiscal Inflation

We estimate the model to assess the role of fiscal policy for the evolution of inflation.

3.1 Changes in beliefs following the ARPA shock

The sequence for the policy regimes are described by the gray areas in Figure 1:

1. The regime sequence for the out-of-the-zero-lower-bound regimes is based on the VAR evidence presented in [Bianchi and Melosi \(2017\)](#). The Fiscally-led regime was in place from 1957:Q2 to 1981:Q3, when the economy switched to the Monetary-led policy mix. The economy was at the ZLB a first time from 2008:Q4 to 2015:Q4 and a second time in correspondence of the COVID pandemic from 2020:Q2 to the end of the sample.
2. **We allow for a change in beliefs about the future policy mix in correspondence of the ARPA fiscal shock in 2021:Q1.** This implies that, formally, a regime change occurred at that date, but this regime change did not alter current policy rules; the only change was in the expected future behavior of policymakers.

We find that:

1. When the economy entered the ZLB, the probability attached to switching to the Fiscally-led regime experienced an increase, but it initially remained relatively modest ($1 - \mathbf{P}_{ZM} \approx 2\%$).
2. **The probability of moving to the Fiscally-led regime increased significantly following the ARPA shock** ($1 - \mathbf{P}_{ZF} \approx 29\%$).

3.2 Fiscal policy and inflation dynamics

Cost-push shocks account for transitory movements of inflation, while long-term transfer shocks account for persistent movements of inflation. Figure 1 presents the contribution of shocks to long-term transfers and cost-push shocks to inflation dynamics.

1. **The Great Inflation:** The low-frequency component of inflation starts increasing in the mid-1960s when the large welfare programs of **the Great Society initiatives** were introduced. These long-term spending shocks, **combined with a Fiscally-led policy mix**, led to an **increase in trend inflation**. Cost-push shocks account for the spikes in inflation in the late 1960s, 1974, and at the end of the 1970s, but not for the rise in trend inflation.

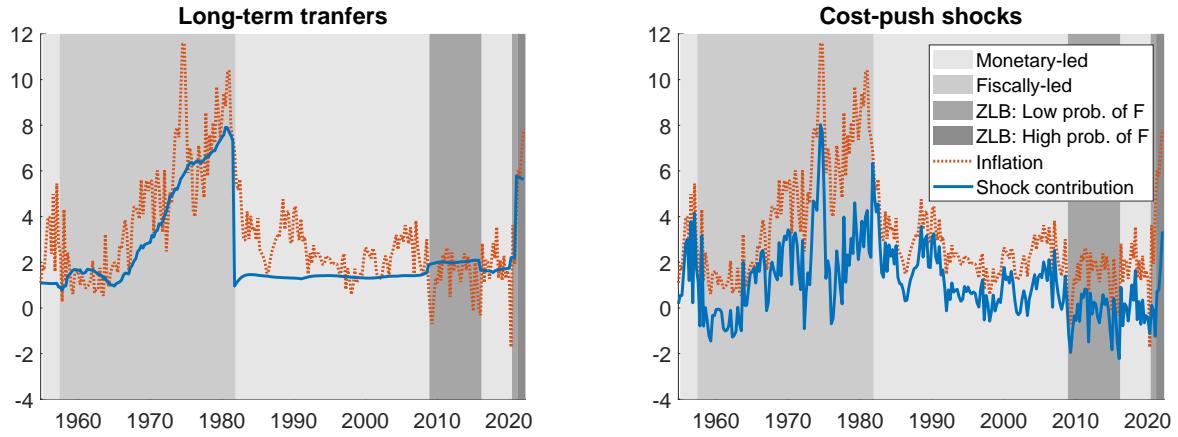


Figure 1 – **Fiscal inflation and cost-push shocks.** The figure reports the contribution of shocks to the long-term component of transfers and cost-push shocks to inflation dynamics over the sample 1954:Q4-2022:Q1. The orange dashed line corresponds to inflation, while the blue solid line corresponds to what inflation would have been if only the shock of interest had occurred, keeping the policy and beliefs regime sequences as given. The gray areas denote the different policy regimes in place.

2. **The Volcker disinflation:** The change in the policy mix in the early 1980s corresponded with a **quick decline in fiscal inflation.** This decline is the result of a **change in both monetary and fiscal policy**, not just monetary policy. President Reagan provided the necessary fiscal backing to the Volcker disinflation.
3. **The Great Moderation:** After this decline in inflation, the fiscal component of inflation remains fairly stable until the ZLB period because of the prevailing policy mix.
4. **The Great Recession:** In the post-2008 period, cost-push shocks tend to *lower* inflation until the onset of the COVID pandemic. The increase in the probability of moving to the Fiscally-led regime estimated for the ZLB periods counteracts this deflationary pressure. **Fiscal inflation is still modest and helps the central bank to avoid deflation.** Thus, historical circumstances might have provided **a false sense of irrelevance of fiscal sustainability considerations.**
5. **The Pandemic:** Following the **ARPA shock**, the **jump in the probability of moving to a Fiscally-led policy mix** determines a **large increase in fiscal inflation.** What drives inflation up is not so much the fiscal shock itself, but the change in beliefs about the future policy mix. Cost push shocks and fiscal shocks account for a similar amount of the post-pandemic inflation.

3.3 Counterfactual: Shutting down fiscal inflation

We consider a counterfactual simulation in which policymakers always follow the Monetary-led policy mix, except when encountering the zero lower bound. This counterfactual captures

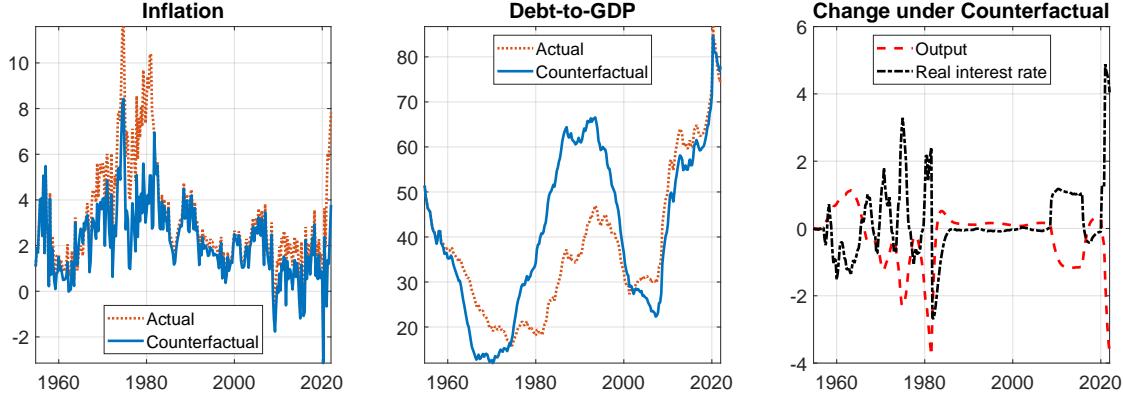


Figure 2 – **Counterfactual simulation: Always Monetary-led policy mix.** This figure compares the realized (Actual) historical behavior of the economy with a counterfactual scenario in which policymakers always follow the Monetary-led policy mix, except when at the zero lower bound. Agents' beliefs are adjusted accordingly: Agents believe that when out of the ZLB, only the Monetary-led policy mix is possible. In the first two panels of the figure reports the change in output and real interest rates under the counterfactual scenario. The sample is 1954:Q4-2022:Q1. The scale is percentage points.

a situation in which there is no doubt about the resolve of the fiscal authority to stabilize debt, **removing fiscal inflation**.

- The first two panels of Figure 2 report the evolution of inflation and debt in the data (Actual) and in the counterfactual scenario. The last panel of the figure reports the change in output and real interest rates under the counterfactual scenario.
- Inflation would have been remarkably lower in the 1960s and 1970s. We still observe the spikes in inflation in correspondence of the oil shocks, but trend inflation remains low. Consistent with this finding, real interest rates would have been higher and output lower. As a result, the debt-to-GDP ratio would have been *higher* during the middle part of the sample. **The low debt and the high inflation of the 1970s are the two sides of the same coin.**
- In the aftermath of the Volcker disinflation, the counterfactual scenario presents slightly lower inflation and higher output. This is because in the baseline model, the possibility of a return to the Fiscally-led policy mix generates a modest inflationary pressure that the central bank counteracts.
- Following the **2008 recession**, the discrepancy between the actual and counterfactual scenarios increases again. Inflation and output would have been visibly lower during the two zero lower bound episodes. **Fiscal inflation helped to avoid deflation.**
- This difference widens significantly once agents' beliefs react to the large change in spending following the ARPA shock. During this period, inflation would have been approximately 4% lower under the counterfactual scenario. However, the output loss

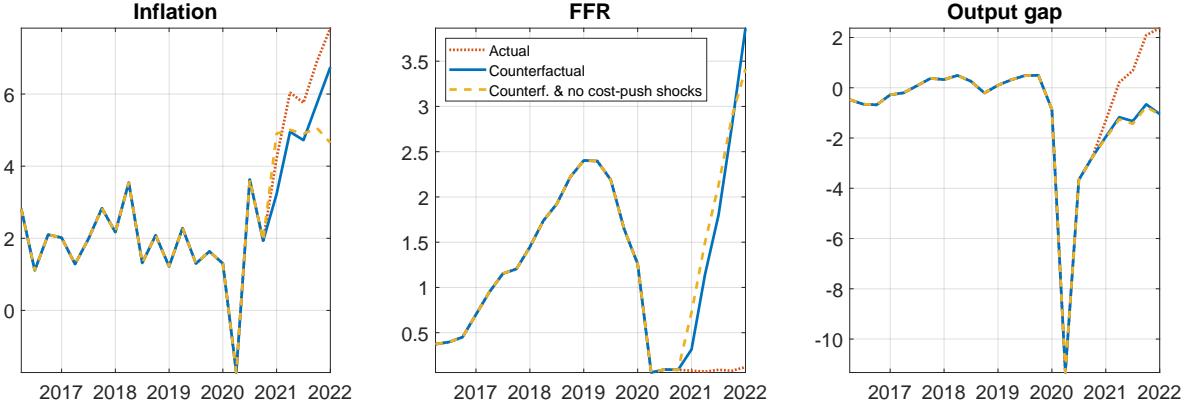


Figure 3 – **Counterfactual simulation: Active monetary policy following the ARPA shock, but no change in beliefs.** The figure reports a counterfactual simulation in which, in response to the ARPA shock in 2021:Q1, the central bank adopts the reaction function of the Monetary-led policy mix, but agents' beliefs about the future policy mix are unchanged. The orange dashed line corresponds to the actual data, the blue solid line corresponds to the counterfactual simulation, and the dashed yellow line corresponds to the counterfactual simulation without cost-push shocks starting from 2021:Q1. Until 2021:Q1 the actual and counterfactual series coincide. The sample is 2018:Q1-2022:Q1.

would also have been large: 3.7% at the end of the sample. ⇒ **The model attributes large part of the post-pandemic recovery and increase in inflation to the change in the perceived probability of moving to a Fiscally-led policy mix.**

⇒ **Fiscal inflation is not always a negative phenomenon. However, a stable and low level of inflation can be achieved only under an appropriate fiscal arrangement.**

4 Conquering the post-pandemic inflation

If trend inflation is in large part a fiscal phenomenon that can be understood in light of changes (or expected changes) in the monetary/fiscal policy mix, **under which conditions can policymakers regain control of inflation in the post-pandemic era?**

4.1 Could monetary policy alone have averted the post-pandemic inflation?

- Given that half of the recent surge in inflation has a fiscal origin, a natural question to ask is whether monetary policy could have neutralized it by stepping on the interest-rate brake more quickly and aggressively and, if so, at what cost.
- We consider a counterfactual scenario in which we modify the behavior of the monetary authority, while keeping agents' beliefs about the future policy mix unchanged:** After the realization of the ARPA stimulus shock and the associated change in beliefs about the future policy mix, the central bank leaves the zero lower bound and increases the policy rate as it would do under the Monetary-led policy mix.

- Figure 3 reports the results. The dotted orange line corresponds to the data (Actual). The blue solid line describes the counterfactual scenario. The yellow dashed line shows the counterfactual scenario *if* no cost-push shocks had occurred starting from 2021:Q1.
- **Anticipating the liftoff and swiftly raising the policy rate *in isolation* would not have averted the post-pandemic surge in prices. This is because half of the increase in inflation observed in 2021 has a fiscal nature.**
 1. The more hawkish monetary policy would have lowered inflation by only 1% at the cost of reducing output by around 3.4%. This is a quite large sacrifice ratio.
 2. This result is not driven by the presence of cost-push shocks. Absent cost-push shocks, output barely changes while inflation remains elevated at around 4.6%.
 3. This result is driven by agents' beliefs. The central bank is increasing the policy rate, but agents still believe that the ARPA stimulus has increased the probability of moving to the Fiscally-led policy mix.

4.2 Fiscal stagflation

What are the results of adopting a resolute anti-inflation monetary policy stance without the necessary fiscal backing?

- We study a simplified version of the model in which the fiscal framework may be perceived to be inconsistent with debt stabilization.
- We remove discrete shocks and the zero lower bound, we allow for changes between a Monetary-led and a Fiscally-led policy mix, and we introduce an additional regime: the **Inconsistent fiscal framework regime**. Under this regime, the monetary authority responds strongly to inflation, but the fiscal authority does not stabilize debt.
- In the baseline scenario, we assume that when encountering the **Inconsistent fiscal framework regime**, agents are convinced that eventually policymakers will move to the Fiscally-led policy and remain there.
- The left panel of Figure 4 shows the impulse responses to a shock to **long-term transfers** across the different policy regimes:
 1. Under the **Fiscally-led policy mix**, the shock causes a large and persistent increase in inflation, as agents understand that the fiscal authority will not implement the necessary fiscal adjustments. This creates inflationary pressure that is accommodated by the central bank.

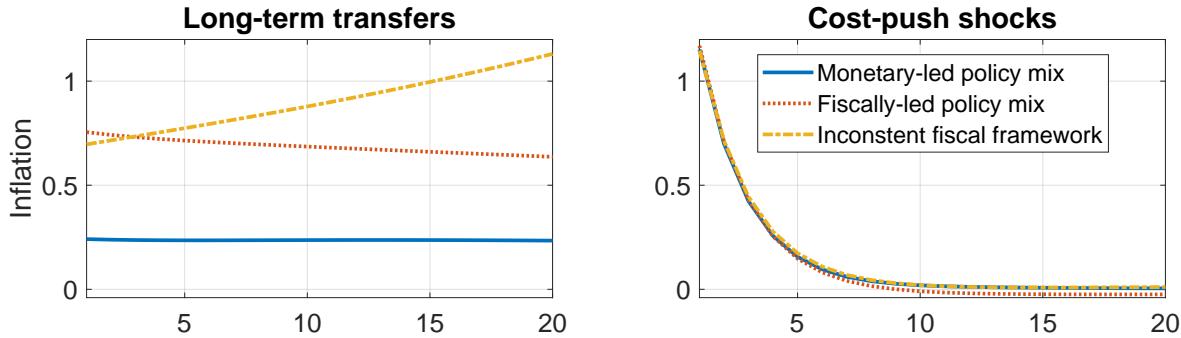


Figure 4 – **Inflation persistence due to fiscal and cost-push shocks.** The figures report the impulse response function of inflation to a one-standard deviation long-term transfers shock (left panel) and to a one-standard deviation cost-push shock (right panel) under the Monetary-led policy mix, the Fiscally-led policy mix, and the absence of a consistent fiscal framework to achieve price stability (inconsistent fiscal framework). Agents know the true transition probabilities of these three policy regimes and form their beliefs accordingly.

2. Under the **Monetary-led policy mix** the shock generates a much smaller increase in inflation. The increase is not zero, because agents consider the possibility of a future regime change. Shocks to long-term transfers do not dissipate quickly. Even if policymakers are currently committed to fiscal adjustments, agents know that the fiscal burden might result in high inflation at some point in the future.
 3. Under the **Inconsistent fiscal framework**, inflation takes an explosive path. The shock to spending determines an increase in the fiscal burden, causing inflationary pressure. The central bank increases rates, causing a recession. The recession and a higher cost of financing debt further increase the fiscal burden that in turn generates additional inflationary pressure, leading to **fiscal stagflation**.
- The right panel of Figure 4 shows that **in response to a cost-push shock, the policy mix in place is almost irrelevant.**
- ⇒ We might see a partial reduction in inflation in the months ahead, as the effects of cost-push shocks fade away. However, **the fiscal component of inflation is likely to persist**, unless the necessary fiscal backing is reinstated.

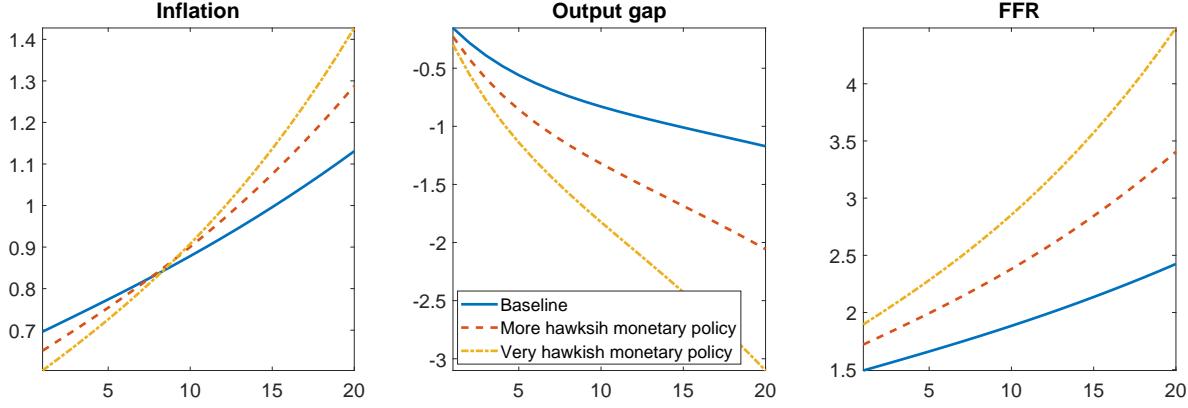


Figure 5 – Fiscal stagflation as the monetary authority becomes more hawkish. Impulse responses of inflation, the output gap, and the federal funds rate (FFR) to a shock to long-term transfers as the central bank becomes progressively more hawkish. Agents expect that eventually the economy will move to a Fiscally-led policy mix and the fiscal authority is not currently implementing fiscal adjustments. The different lines correspond to different values for the parameter controlling the response of the monetary authority to inflation, ψ_π . The blue solid line corresponds to the posterior mode estimate for $\psi_{\pi,M}$, the orange dashed line increases the value of this parameter by 25%, while the yellow line increases the value of this parameter by 50%.

4.3 Reining in fiscal inflation and avoiding fiscal stagflation

What can policymakers do to combat a rise in fiscal inflation?

1. **More hawkish monetary policy unbacked by fiscal adjustments.** Figure 5 shows the response of inflation, the output gap, and the interest rate to a shock to long-term transfers as the central bank becomes progressively more hawkish, while agents remain convinced that policymakers will eventually move to a Fiscally-led regime.

- (a) As the central bank increases the response to inflation, the initial jump in inflation becomes smaller at the cost of generating a larger contraction in real activity. **The success on inflation is ephemeral.** Eventually the paths of inflation cross and the more hawkish response leads to higher inflation and larger output losses.
- (b) While the response of the monetary authority to fiscal inflation becomes progressively more hawkish, agents' beliefs about future policy remain unchanged. The more hawkish the monetary policy response, the larger the increase in the fiscal burden, the larger the acceleration in inflation.

If fiscal policy is perceived to be inconsistent with price stability, more hawkish monetary policy can be counterproductive, exacerbating fiscal stagflation.

2. **More sustainable fiscal policy.** Figure 6 revisits the impulse responses to a shock to long-term transfers as we progressively reduce the probability of a change to the Fiscally-led regime, while keeping the anti-inflationary stance of the central bank fixed. This analysis sheds light on the effects of agents becoming more confident that the fiscal authority will eventually stabilize the increase in debt.

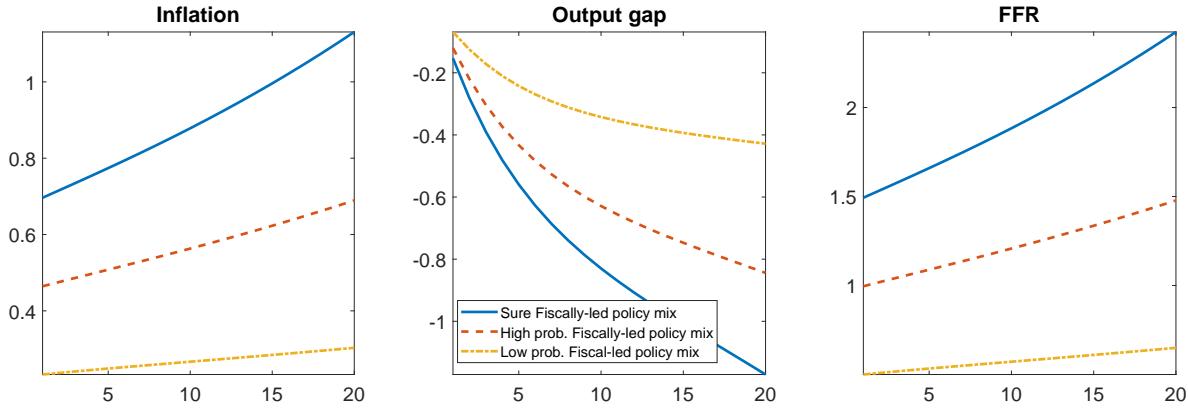


Figure 6 – Fiscal stagflation as agents’ beliefs about the future policy mix vary. Impulse responses of inflation, the output gap, and the federal funds rate (FFR) to a shock to long-term transfers as beliefs about the future policy mix change. The central bank responds to inflation as implied by the Monetary-led policy mix while the fiscal authority does not adjust taxes. The different lines correspond to different probabilities that the next policy mix will be Fiscally-led; – the blue line: Fiscally-led policy mix is expected to follow with certainty; orange dashed line: Fiscally-led policy mix is expected to follow with probability 0.67; yellow dotted-dashed line: Fiscally-led policy mix is expected to follow with probability 0.33.

- (a) As we progressively reduce the probability of a change to the Fiscally-led policy mix, the inflationary pressure goes down and fiscal stagflation is mitigated.
- (b) If a change to the Fiscally-led policy mix is completely ruled out, the inflationary pressure and fiscal stagflation disappear.

Reining in fiscal inflation requires reassuring the private sector that **fiscal policy is compatible with the desired level of inflation**.

5 Conclusions

- Historically, movements in fiscal inflation account for changes in trend inflation, while cost-push shocks determine more transitory movements. Thus, an implicit **fiscal limit** arises to the extent that **a low and stable inflation target requires fiscal policies that are consistent with this goal**.
- Following the COVID pandemic, the United States, like many other countries, has implemented robust fiscal interventions. These policy interventions facilitated the **quick rebound of the economy**, but they also contributed to the **surge in fiscal inflation**.
- **Increasing rates, by itself, would not have prevented the recent surge in inflation.**
- **Conquering the post-pandemic inflation requires mutually consistent monetary and fiscal policies** providing a clear path for both the desired inflation rate and debt sustainability.