

# FROM OKUN'S LAW TO FISCAL MULTIPLIERS IN FRANCE AND ITALY

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## ABSTRACT

This paper introduces a novel application of the Updated Okun Method to estimate fiscal multipliers. By leveraging Okun's Law to compute potential output and the output gap, we construct a new measure of the fiscal stance that improves transparency and interpretability. Applying this approach to France and Italy, we find that both economies were operating below full potential for most of the sample period, and that fiscal policy was more contractionary than standard estimates suggest. Our analysis reveals significant differences in fiscal multiplier effects across the two countries, with evidence of state-dependence in France, where fiscal policy is more effective during periods of economic slack, while no such variation is observed for Italy. These findings underscore the importance of aligning fiscal policy with economic conditions, particularly in the context of public debt sustainability debates.

## KEYWORDS

Okun, fiscal multiplier, potential output, output gap.

## JEL

E23, E62, H62.



# From Okun’s Law to Fiscal Multipliers in France and Italy

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November 2025

## Abstract

This paper introduces a novel application of the Updated Okun Method to estimate fiscal multipliers. By leveraging Okun’s Law to compute potential output and the output gap, we construct a new measure of the fiscal stance that improves transparency and interpretability. Applying this approach to France and Italy, we find that both economies were operating below full potential for most of the sample period, and that fiscal policy was more contractionary than standard estimates suggest. Our analysis reveals significant differences in fiscal multiplier effects across the two countries, with evidence of state-dependence in France, where fiscal policy is more effective during periods of economic slack, while no such variation is observed for Italy. These findings underscore the importance of aligning fiscal policy with economic conditions, particularly in the context of public debt sustainability debates.

## 1 Introduction

This paper reassesses fiscal policy effectiveness using new estimates of the structural budget balance to derive fiscal multipliers. Building on the Updated Okun Method, which employs Okun’s Law to estimate the output gap and structural budget balances (see Fontanari et al. (2020, 2022); Carnazza et al. (2023)), we link this approach to the empirical literature on fiscal multipliers (see Ramey and Zubairy (2018)). Applying the method to France and Italy, we estimate multipliers based on a newly constructed measure of the fiscal stance. Given the elevated risks of unsustainable public debt in both countries (see, e.g., Menguy (2024a)), evaluating the short-term costs of fiscal consolidation is

essential to designing growth-friendly debt stabilization strategies (see, e.g., Orseau et al. (2022)).

In general, the computation of the cyclically-adjusted budget balance requires to assess a benchmark level of activity and to compare it with actual GDP. The resulting output gap is the outcome of an estimation or a simulation between an unobservable variable, potential output, and an observable one, actual output. In practice, there are two main methods to estimate potential output: either a statistical approach or a production function approach (see Barigozzi and Luciani (2023) for a recent contribution and an overview of the literature). Estimates relying on statistical filtering techniques applied to historical GDP data predominantly use the Hodrick-Prescott (1997) or Hamilton (2018) filter (see e.g., de Haan et al. (2023)). Institutions like the European Commission rely on a production function approach, which similarly depends on statistical filtering to derive input components.

These methods have been widely criticized for their procyclicality, meaning that potential output estimates tend to move in tandem with actual output due to an over-reliance on recent data points (see e.g., Heimberger et al. (2020)). Essentially, these approaches produce little more than a historical average rather than an economically meaningful concept that extracts a structural unemployment or output level, making them susceptible to misinterpretation, when temporary shocks distort the average values.

In an attempt to address these limitations, an emerging strand of literature has reverted to the definition of potential output as the level of output achievable under full and efficient resource utilization. This approach, the Updated Okun Method, relies on empirical relationships between output and unemployment, as described by Okun's Law (see e.g. Fontanari et al. (2020)). By basing potential output estimates on observable labor market variables and an unemployment target, this method enhances transparency and interpretability of the fiscal stance in economic policy discussions. In the following, we expand the work of Carnazza et al. (2023) by incorporating higher-frequency data for Italy and including France in the analysis of potential output, the output gap and the structural budget balance. Unlike the standard methodologies employed to estimate the output gap, the Updated Okun Method does not impose a mean-reverting process. As a result, the no-

tion of an “adjustment to the cycle”, which underlies the concept of the “cyclically-adjusted budget balance”, becomes conceptually inappropriate. Accordingly, we will hereafter refer to the component of the budget balance that is independent of economic activity as the structural budget balance.

But most importantly, in this paper, we extend the work on the Updated Okun Method by using it to compute fiscal multiplier effects from fiscal shocks, identified as quarterly changes in the new measure of the structural budget balance. Estimating fiscal multipliers allows us to assess the effectiveness of fiscal measures in stabilizing the economy, which is a central objective of fiscal policy at least since Musgrave (1959) identified it as one of its three fundamental functions besides resource allocation and distribution. This estimation is inherently challenging due to the issue of reverse causality between fiscal policy and economic growth (Blanchard, 1990). It is therefore essential to isolate the exogenous component of fiscal policy that does not directly respond to economic conditions.

Conceptualizing potential output as full capacity utilization rather than a historical average leads to significantly larger output gap estimates for both France and Italy. In this framework, the average output gap is not by definition zero, as in conventional methods, but instead reflects the gap between an economy’s actual labor market conditions and its target capacity. The results show that the French and Italian economies were operating below full potential for most of the sample, with average output gaps remaining negative. Consequently, the structural budget balance based on the Updated Okun Method suggests a more contractionary fiscal stance compared to the European Commission’s production function approach.

To estimate fiscal multipliers, we follow the methodology developed by Ramey and Zubairy (2018), which uses local projections to estimate the dynamic response of output to identified fiscal shocks. Crucially, their approach accounts for the state of the economy allowing to distinguish between periods of slack and expansion, while using government spending innovations that are plausibly exogenous. Our analysis evaluates whether fiscal shocks have had real effects on economic activity in France and Italy. Given that both countries belong to the Euro area since 1999, their

fiscal multipliers are not distorted by differing monetary policy stances, making them comparable with each other<sup>1</sup>.

Our results indicate positive but rather short-lived fiscal multipliers in France and Italy. However, in the case of France, the effectiveness of fiscal policy on real activity depends crucially on the timing of its implementation. By “timing of implementation”, we refer to whether the economy exhibits slack during a given period, which we proxy using unemployment rate thresholds. Usually, we can expect that fiscal multipliers tend to be larger when economic capacity is underutilized. First, this would be consistent with the empirical outcomes from the meta-analysis of Gechert and Rannenberg (2018). Second, from a theoretical standpoint, during periods of economic slowdown or recession (when a negative output gap prevails) the government can deploy additional fiscal resources without inducing resource constraints in labor, capital, or financial markets. Under such conditions of underutilized capacity, fiscal expansion is unlikely to generate significant wage or price pressures that would provoke a damping monetary policy reaction. Consequently, a fiscal stimulus in this environment should neither result in higher inflation nor crowd out private investment through increased interest rates. Conversely, implementing a fiscal contraction in the presence of economic slack would exert a contractionary effect on real activity and could compromise the effectiveness of fiscal frameworks, such as expenditure rules (see e.g., Martin et al. (2021) or Menguy (2024a)), aimed at ensuring public debt sustainability. Nevertheless, fiscal expansion can also be effective during the expansionary phase of the business cycle, particularly if public investment stimulates complementary private investment, via a crowding-in effect, and encourages firms to expand productive capacity (on crowding-in effects, see e.g., Friedman (1978); Pereira (2001)). The extent to which fiscal policy effectiveness depends on the cyclical position of the economy thus remains an empirical question.

The rest of the paper is organized as follows. Section 2 briefly recalls the Okun’s Law and derives potential output, output gap and the fiscal stance from the Okun coefficient. Section 3 discusses the results for France and Italy. Building on these estimates, Section 4 discusses fiscal multipliers

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<sup>1</sup>Fiscal multipliers of countries in a monetary union may be viewed as similar to fiscal multipliers of federal states in the United States, see Nakamura and Steinsson (2014).

and compares the effects of fiscal shocks under alternative thresholds for economic slack. Section 5 concludes.

## 2 From Okun’s Law to fiscal multipliers: method and data

The estimation of Okun’s Law provides the basis for deriving potential output and the output gap under the Updated Okun Method. By adding the product of the semi-elasticity of the budget balance and the estimated output gap to the observed fiscal balance, we construct a new measure of the structural budget balance. The quarterly change in this structural balance is then identified as a fiscal shock, which serves as the input for estimating fiscal multipliers using local projection methods.

### 2.1 Okun’s Law

After Arthur Okun’s (1962) analysis of the relationship between unemployment and economic activity, two theoretical approaches to specify the Okun’s Law have emerged. The first one is the “levels” or “gap” specification. The Okun coefficient ( $\beta$ ) stems from the specification in Equation 1.

$$U_t - U^* = \beta \times \frac{Y_t - Y_t^{Pot}}{Y_t} + \theta_t \quad (1)$$

Notes:  $U_t$  is the unemployment rate at time  $t$ ,  $U^*$  is the target for the unemployment rate,  $Y_t^{Pot}$  is potential output,  $Y_t$  is the actual output and  $\theta_t$  is the error term.

The second approach is the “changes” or “first-difference” specification, in which the change in the unemployment rate is regressed on the output change. Equation 2 illustrates the estimation of the Okun coefficient ( $\beta$ ) in this specification.

$$\Delta U_t = \alpha + \beta \Delta Y_t + \varepsilon_t \quad (2)$$

Notes:  $\Delta U_t$  is the change in the unemployment rate at time  $t$ ,  $\Delta Y_t$  is the change in actual output,  $\alpha$  is a constant, and  $\varepsilon_t$  is the error term.

According to the results found by Okun (1962), a 1 percentage point increase in output growth is

typically associated with a reduction in unemployment by 0.3 percentage points, a finding consistent across both specifications.

The body of research on Okun’s Law is extensive and varied (see e.g., Ball et al. (2017) or Porras-Arena and Martin-Roman (2023) for comprehensive surveys). Debates continue notably on the stability of Okun’s Law throughout different time periods and on the value of the Okun coefficient across countries.

## 2.2 Okun coefficient

While Okun’s Law in the “levels” specification requires assumptions about potential output and potential unemployment, its “changes” version avoids these direct estimations by endogenously determining potential output based on a constant unemployment target<sup>2</sup>. In his original work, Okun (1962) defined full employment relative to a policy-determined target for the unemployment rate, rather than a “natural” rate derived from labor market equilibrium conditions<sup>3</sup>. Moreover, the “changes” version is more common in empirical macroeconomics (Porras-Arena and Martin-Roman, 2023) and produced stable results over time, for example in the United States (Ball et al., 2017). We therefore adopt the “changes” specification in our analysis.

To compute the Okun coefficient  $\beta$ , we regress the change in the unemployment rate on current and lagged output growth in a distributed lag specification:

$$\Delta U_t = \alpha + \sum_{j=0}^p \beta_j \Delta Y_{t-j} + \varepsilon_t \quad (3)$$

Notes: U stands for the unemployment rate, Y is GDP at constant prices,  $\Delta$  stands for the change operator,  $\alpha$  is a constant and  $\varepsilon$  is the error term. The lag order  $p$  is chosen by information criteria.

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<sup>2</sup>Assuming a constant unemployment rate target and a constant potential output growth rate, the “changes” version can be derived by differencing the “levels” specification.

<sup>3</sup>Later contributions like Lee (2000) or Ball et al. (2017) applied the “levels” specification using smoothed time series or a non-accelerating inflation rate of unemployment to estimate potential output and a “natural” rate of unemployment, reflecting a more structural interpretation, which is different from Arthur Okun’s conceptualization.

We estimate the model using Ordinary Least Squares (OLS). If the Breusch-Godfrey test detects serial correlation in the residuals, we report Newey-West heteroskedasticity- and autocorrelation-consistent standard errors. The number of lagged GDP growth terms,  $p$ , which allow us to capture delayed labor market responses to changes in output, is selected based on the Akaike and Bayesian Information Criteria. The Okun coefficient is the sum of the contemporaneous and lagged coefficients on output growth, i.e.  $\beta_{okun} = \sum_{j=0}^p \beta_j$ .

### 2.3 Deriving the fiscal stance from Okun's coefficient

We use the estimated Okun coefficients to calculate potential output in line with Fontanari et al. (2022). According to their method, the output gap does not rest exclusively on the adjustment of the supply-side of the economy to its so-called equilibrium value, but also depends on demand factors that may show some hysteresis.

The resulting expression for potential output is:

$$Y_t^{Pot} = Y_t \times [1 - \frac{1}{\beta_{okun}}(U_t - U^*)] \quad (4)$$

Notes:  $U$  stands for the unemployment rate,  $*$  indicates a benchmark (or targeted) level, and  $Y_t^{Pot}$  stands for the potential output.

Potential output thus depends on the value of the Okun coefficient estimated in the first step, but also on a benchmark level of the unemployment measure  $U^*$ . We prefer to interpret  $U^*$  as a target for the policymaker, in line with Okun's theoretical work. Depending on the objective of unemployment that policymakers will give themselves, the targeted output (or potential output) ensues accordingly.

Finally, we compute the structural budget balance (SBB) as the difference between the fiscal balance (FB) and a cyclical component. The SBB is thus proportional to the output gap (OG) according to the semi-elasticity of the budget balance  $\mu^4$ . Equation 5 and Equation 6 illustrate this.

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<sup>4</sup>This is a simplified version of the method followed by Girouard and André (2006) who distinguish between the semi elasticities of tax receipts and spending vis-à-vis the output gap.

$$OG_t = \frac{Y_t}{Y_t^{Pot}} - 1 \quad (5)$$

$$SBB_t = FB_t + \mu OG_t \quad (6)$$

## 2.4 Estimating fiscal multipliers

To estimate the effects of fiscal shocks on macroeconomic outcomes, we use the local projection method introduced by Jordà (2005) and adapted for fiscal policy analysis by Ramey and Zubairy (2018). This method allows us to estimate impulse response functions (IRFs) flexibly, without imposing strong assumptions about the underlying data dynamics, as is required in VAR models.

We define the fiscal shock as the quarterly change in the structural budget balance, constructed as described in previous sections. To trace the dynamic responses of real GDP to these shocks, we estimate a series of regressions at different forecast horizons. Specifically, for each horizon  $h$  up to 20 quarters after the shock, we estimate Equation 7.

$$Y_{t+h} = \alpha_h + \beta_h \text{fiscal shock}_t + \sum_{j=1}^p \gamma_{h,j} X_{t-j} + \varepsilon_{t+h}, \quad \text{for } h = 0, 1, \dots, 20 \quad (7)$$

Notes:  $Y_{t+h}$  is the dependent variable of interest (i.e., GDP) at horizon  $h$ , the fiscal shock at time  $t$  measured as the quarterly change in the structural budget balance, and  $X_{t-j}$  denotes a vector including lags of the dependent variable and the fiscal shock as control variable. The coefficient  $\beta_h$  captures the response of the outcome variable  $h$  periods after the fiscal shock.

The IRF is then constructed by mapping the fiscal multiplier at each horizon  $h$  and plotting it over time. It indicates how much output changes in response to a one-euro expansionary shock to the structural budget balance in each quarter up to five years after the shock occurred.

To capture potential differences in the fiscal multiplier depending on the economic environment, the local projection framework can easily be extended to a state-dependent specification, as Ramey and Zubairy (2018) demonstrate. Using Equation 8, we divide the sample based on whether the economy is in a slack state or not, as indicated by a binary variable  $\text{Slack}_{t-1}$ . This approach allows

the fiscal shock to have different dynamic effects on the outcome variable  $Y_{t+h}$  depending on the state of the labor market, capturing possible differences in the response of GDP to fiscal policy.

$$\begin{aligned}
Y_{t+h} = & \text{Slack}_{t-1} \times (\alpha_h^S + \beta_h^S \text{fiscal shock}_t + \sum_{j=1}^p \gamma_{h,j}^S X_{t-j}) \\
& + (1 - \text{Slack}_{t-1}) \times (\alpha_h^{NS} + \beta_h^{NS} \text{fiscal shock}_t + \sum_{j=1}^p \gamma_{h,j}^{NS} X_{t-j}) \\
& + \varepsilon_{t+h}, \quad \text{for } h = 0, 1, \dots, 20
\end{aligned} \tag{8}$$

Notes:  $Y_{t+h}$  is the dependent variable of interest (i.e., GDP) at horizon  $h$ .  $\text{Slack}_{t-1}$  is a binary indicator equal to 1 if the economy is in a slack state at time  $t-1$ , and 0 otherwise. The fiscal shock at time  $t$  is measured as the quarterly change in the structural budget balance. The vectors  $X_{t-j}$  include lags of the dependent variable and the fiscal shock as control variables. The coefficients  $\beta_h^S$  and  $\beta_h^{NS}$  capture the state-dependent response of the outcome variable  $h$  periods after the fiscal shock, in slack and non-slack states respectively.

Again, we can construct an IRF that indicates how much output changes in response to a one-euro expansionary shock to the structural budget balance in each quarter contingent on whether the fiscal shock happened when the economy was in a state of slack or not.

## 2.5 Data

Due to limitations on data availability, we focus mainly on France, where the sample starts in 1980Q1. For the sake of comparison, we also consider Italy, another important member of the Euro area, where the sample starts in 1999Q1<sup>5</sup>.

Details on quarterly data sources are presented in Table 1. The data mainly comes from the respective national statistics offices and Eurostat. For GDP and unemployment data, we cross-checked with OECD data. Although data from the French national statistics office Insee did not exactly match the OECD unemployment rate time-series, we relied on the former source due to its longer sample.

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<sup>5</sup>It is an avenue for future research to replicate our work in other countries where quarterly data are available on a sufficient long sample, beyond the US on which a companion paper already circulates (see Creel and Kaiser (2024)).

| Country | Sample period   | Unemployment rate | Real GDP   | Fiscal balance |
|---------|-----------------|-------------------|------------|----------------|
| France  | 1980Q1 - 2019Q4 | Insee             | Insee/OECD | Eurostat       |
| Italy   | 1999Q1 - 2019Q4 | IStat/OECD        | IStat/OECD | IStat/Eurostat |

Table 1: Data overview

### 3 Okun’s coefficients for France and Italy

The results of Okun’s Law for France and Italy are reported in Table 2. We use OLS with Newey-West heteroskedasticity- and autocorrelation-consistent standard errors<sup>6</sup>. This approach corrects the standard errors for potential serial correlation and heteroskedasticity in the residuals, which are common in macroeconomic time series. The use of lagged GDP growth terms allows us to capture delayed labor market responses to changes in output, in line with the specification described in Equation 3. The Akaike and Bayesian Information Criteria suggest two lags for France and three lags for Italy. The Okun coefficient is calculated as the sum of the contemporaneous and lagged coefficients on output growth ( $\beta_{okun} = \sum_{j=0}^p \beta_j$ ).

In France, the Okun coefficient is found to be -0.31. It is equal to -0.30 in Italy. Both are in a similar range, yet slightly smaller in absolute terms than recent estimates reported for the United States. Ball et al. (2017) find the latter to be -0.43 in a sample from 1948 to 2013. Labor markets in France and Italy are thus slightly less responsive to output shocks. This is consistent with the fact that France and Italy enjoy stronger labor protection regimes than the U.S., which make it harder for firms to hire-and-fire based on current economic conditions. According to the data on the strictness of employment protection released by the OECD on individual and collective dismissals for regular contracts, the average values for France and Italy between 2000 and 2019 are respectively 2.73 and 3.18<sup>7</sup>. Despite a significant labor market liberalization in Italy, where the indicator stands at 2.68 in 2019, employment protection remains still much higher than in the U.S. where the indicator has remained at 0.67 over the last two decades.

We use the Supremum Wald test to identify potential structural breaks. The test identifies a

<sup>6</sup>The Breusch-Godfrey test identifies serial correlation in regression residuals in our data for France and Italy.

<sup>7</sup>The indicator ranges from 0 (no protection) to 6 (maximum protection).

| VARIABLES          | Unemployment rate change |                      |
|--------------------|--------------------------|----------------------|
|                    | France                   | Italy                |
| GDP growth         | -0.062**<br>(0.027)      | -0.168***<br>(0.053) |
| L.GDP growth       | -0.151***<br>(0.031)     | -0.013<br>(0.052)    |
| L2.GDP growth      | -0.100***<br>(0.036)     | -0.042<br>(0.043)    |
| L3.GDP growth      | -                        | -0.130***<br>(0.041) |
| Constant           | 0.157***<br>(0.022)      | 0.020<br>(0.036)     |
| Observations       | 160                      | 84                   |
| Time period        | 1980 - 2019              | 1999 - 2019          |
| Adjusted R-squared | 0.321                    | 0.366                |

Newey-West standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Table 2: Regression results Okun coefficient

Notes: The distributed lag model is estimated with an Ordinary Least Squares regression using Newey-West heteroskedasticity- and autocorrelation-consistent standard errors according to Equation 3. The Okun coefficient can be calculated as the sum of the statistically significant contemporaneous and lagged coefficients on output growth ( $\beta_{okun} = \sum_{j=0}^p \beta_j$ ).

potential structural break for France in the first quarter of 1985 and in the first quarter of 2011 for Italy. Despite these breaks, in both cases, the Okun coefficients of the different sub-samples are very close one to another, and very close to those on the entire sample<sup>8</sup>. Consequently, we remove structural breaks from the analysis.

Building on the Okun coefficients obtained on the entire sample for each country, we compute the potential output and the output gap as outlined in Section 2. We set the target for the unemployment rate equal to the sample mean minus one standard deviation, which is 7.5% for France and 7.6% for Italy. Considering the history of the unemployment rate in both countries, where the sample mean has been 8.5% and 9.5% of the labor force on the entire sample, respectively in France and Italy, the chosen targets for the unemployment rate can be viewed as a reachable lower bound. Output gap estimates are significantly larger in absolute value than the official estimates by the European

<sup>8</sup>Results are available from the authors upon request.

Commission. Table 3 shows that in the sample period from 1980 to 2019, the absolute value of the output gap computed with the Updated Okun Method was 2.77 pp larger for France. For Italy, it is 5.13 pp larger over the sample period from 1999 to 2019<sup>9</sup>.

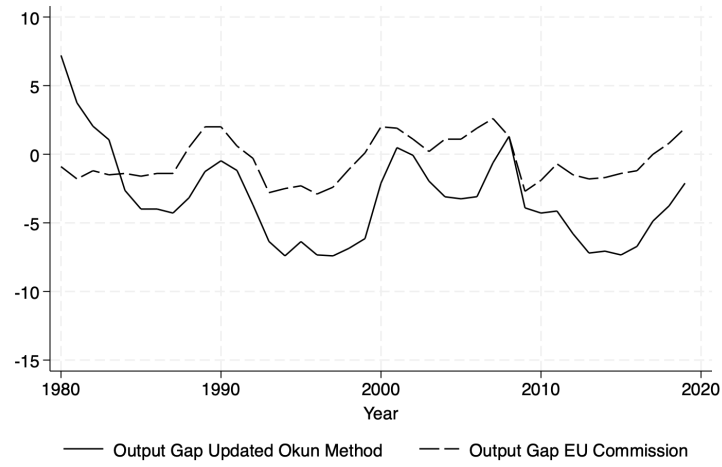
| <b>Country</b> | Period      | Updated Okun Method | European Commission<br>production function |
|----------------|-------------|---------------------|--------------------------------------------|
| <b>France</b>  | 1980 - 2019 | -3.20               | -0.43                                      |
| <b>Italy</b>   | 1999 - 2019 | -5.63               | -0.50                                      |

Table 3: Output gap (% of potential GDP)

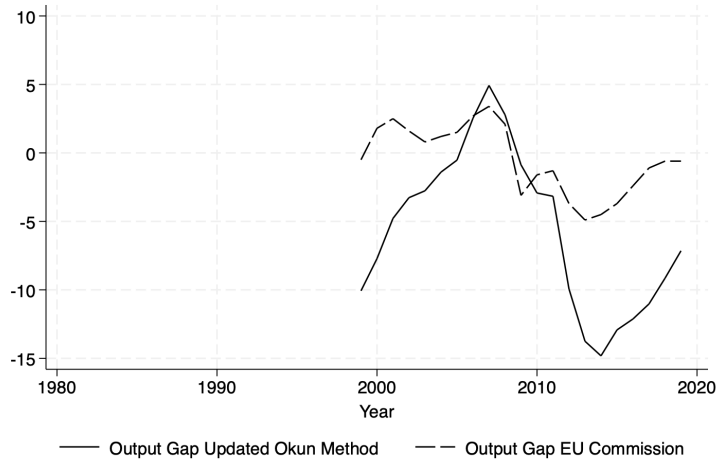
Notes: The Updated Okun Method is based on quarterly data and the European Commission production function data is based on annual data.

For the sake of comparison, Figure 1 plots the annualized values of the output gap obtained with the Updated Okun Method against the European Commission’s estimates. They make immediately clear that the estimates by the European Commission are mean-reverting around zero whereas such a pattern is absent under the Updated Okun Method. The latest method shows lasting periods of a negative output gap, similarly to Carnazza et al. (2023) for Italy, which give evidence of the inability of policymakers in both countries to reach the lower bound of the unemployment rate. There are a few exceptions though. In the case of France, the output gap under the Updated Okun Method was positive before the “Tournant de la Rigueur” in 1982-1983 when the French government opted for a fiscal contraction, and in the early and late 2000s, just before two major economic crises which plunged the economy into a recession: the dot-com crisis of 2001 and the global financial crisis of 2007-2009. In the case of Italy, the period before the onset of the global financial crisis also shows a positive output gap, very comparable to the one estimated by the European Commission. While we share the same method as Carnazza et al. (2023), using a higher (quarterly) frequency than them, we obtain quite different values of the output gap at this period. The trend is very consistent (Carnazza et al. (2023) report a sharp improvement in the output gap until the global financial crisis) but they never report a positive output gap. This is due to their very ambitious choice of a target for the unemployment rate at 5.1% or 6.1% for Italy to converge to European’s best standards (5.1% corresponds to the sample mean unemployment rate of core euro area countries).

<sup>9</sup>Note that the European Commission only reports output gaps annually, while our measure produces quarterly estimates.



(a) France



(b) Italy

Figure 1: Annualized output gap

Unsurprisingly, when one considers the new estimates of the output gap, the estimates of the structural budget balance for France and Italy are more on the consolidation side than those of the European Commission. Table 4 shows that following the Updated Okun Method suggests that France ran a structural deficit over the 1980-2019 period of around 1.2% of potential GDP on average. Italy had even a structural surplus of 0.9% on average from 1999 to 2019. The European Commission estimates, in contrast, draw a different picture of French and Italian public finances over

the respective periods with a gap of 2 to 3 pp. The average structural deficit for France according to the European Commission was 3.2% of potential GDP while it was 2.6% for Italy.

| <b>Country</b> | <b>Period</b> | <b>Updated Okun Method</b> | <b>European Commission<br/>production function</b> |
|----------------|---------------|----------------------------|----------------------------------------------------|
| <b>France</b>  | 1980 - 2019   | -1.19                      | -3.19                                              |
| <b>Italy</b>   | 1999 - 2019   | 0.86                       | -2.64                                              |

Table 4: Structural budget balance (% of potential GDP)

Notes: The Updated Okun Method is based on quarterly data and the European Commission production function data is based on annual data.

## 4 Fiscal multiplier effects: application to France and Italy

We compute new estimates of the structural budget balance, i.e. a measure of the fiscal balance that has been corrected for the endogeneity of the business cycle, but without having to rely on the controversial unobservable potential output. To do so, we have proceeded in two steps. First, we have followed Fontanari et al. (2022) and Carnazza et al. (2023) using the Updated Okun Method to extract the structural budget balance from our new estimates of the output gap, as Section 3 has shown. In a second step, we now identify a fiscal shock.

There are two main methods in the literature to identify a fiscal shock: the narrative approach and the econometric approach. In their influential contribution, Ramey and Zubairy (2018) use both methods: a narrative approach based on military spending news and the recursive approach of Blanchard and Perotti (2002) which distinguishes between government spending and taxes.

In the case of France and Italy, there is no database for spending news, which therefore does not permit to replicate Ramey and Zubairy’s (2018) approach. Moreover, we have applied the Updated Okun Method to the computation of a structural budget balance, without distinguishing between structural and non-structural government spending and tax receipts. We leave that to further research and concentrate on another method to identify a fiscal shock.

More precisely, we characterize the fiscal shock as the fiscal stance, i.e. the quarterly change in the structural budget balance. While this constitutes a relatively rough characterization of a fiscal shock, especially when compared to the more sophisticated approaches discussed above, this measure of the fiscal stance aligns with the one commonly used by economic forecasters and policymakers to forecast GDP and conduct policy or counterfactual simulations. Notably, it is employed in large-scale semi-structural macroeconomic models such as FRB/U.S. and ECB-BASE (see Bankowski (2023); Brayton and Reifschneider (2022)). A positive change (i.e., an improvement in the structural budget balance) is interpreted as a discretionary fiscal contraction, whereas a negative change indicates a discretionary fiscal expansion.

Moreover, the fiscal stance exhibits the expected properties of a policy shock, notably the fact that it is unexpected. Indeed, there is no prior announcement of the quarterly fiscal stance so that it cannot be expected by the public before the fiscal stance is implemented. Furthermore, the fiscal stance is exogenous to output, as it is purged of any feedback from past changes in GDP. This exogeneity has been checked by regressing the fiscal stance on the output gap and finding that the coefficient on the lagged output gap is not statistically different from zero<sup>10</sup>. Finally, the fiscal stance is short-lived and does not follow an auto-regressive process, which is confirmed with the Breusch-Godfrey test for autocorrelation<sup>11</sup>.

With this identification of a fiscal shock, we can revisit the fiscal multiplier effect following the local projections as outlined in Section 2.4. We also investigate whether the fiscal multiplier is context-dependent: higher during a recession and lower during an expansion.

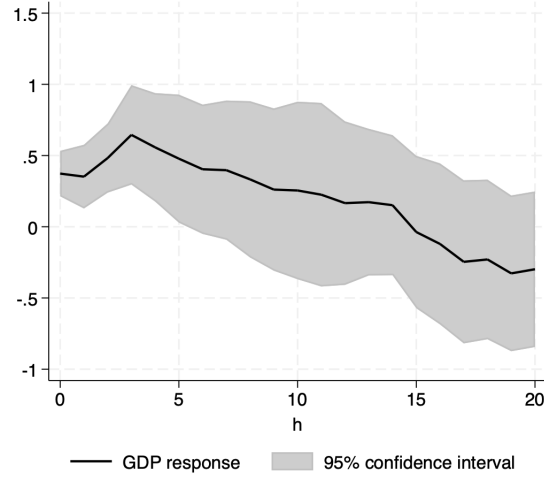
The fiscal multipliers are presented in Figure 2. The instantaneous fiscal multipliers are very close for both countries with 0.4 for France and 0.3 for Italy. After that, the fiscal multiplier for France shows a peak at 0.7 after one year. Italy's peak is reached at 0.6 after three years. However, the statistical significance of the multiplier effect is more persistent in France, where it remains

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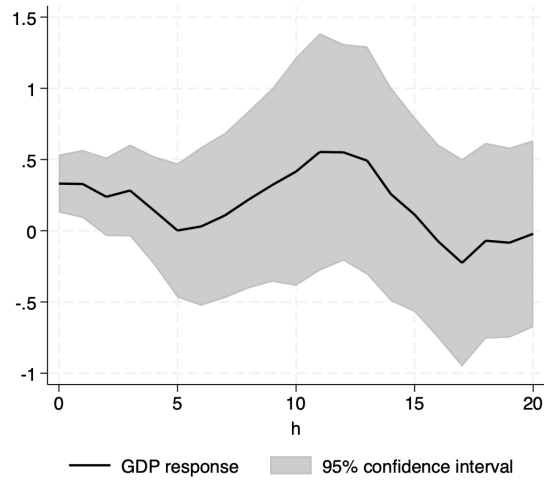
<sup>10</sup>Results can be found in the Appendix.

<sup>11</sup>Again, results are available in the Appendix.

statistically different from zero for up to six quarters, whereas in Italy it becomes statistically insignificant after only three quarters.



(a) France



(b) Italy

Figure 2: Impulse response functions

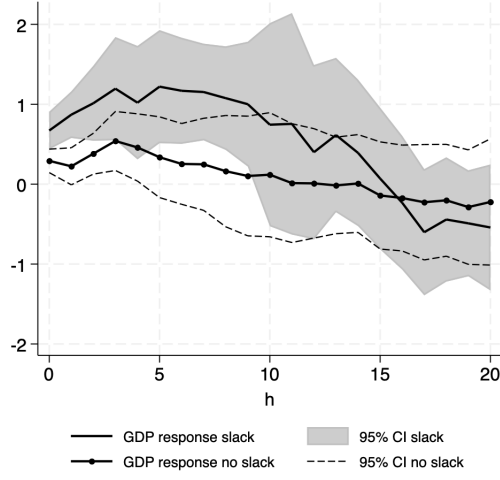
Results for France are lower than those at impact by Cléaud et al. (2017) on a shorter sample (theirs end in 2010). They are closer to those in Herbert (2014) when she identifies recession years and finds a fiscal multiplier equal to 0.2. Results for Italy are below those found by Giordano et al.

(2007) who report a fiscal multiplier of 0.6, but we share the empirical fact that the fiscal multiplier vanishes quite rapidly.

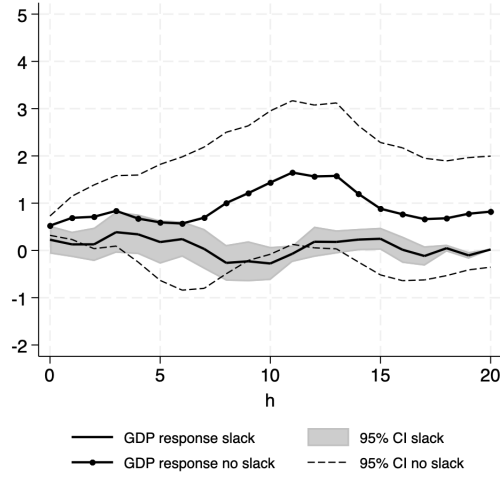
Now, if we separate the sample of data between (bad) times of slack and (good) times of expansion, the fiscal multipliers for France and Italy show quite a different picture. To distinguish between bad and good times, we use the average unemployment rate over the sample plus half a standard deviation to identify if the labor market has been in significant slack. The choice of a limited additional standard deviation (half and not one, for instance) has been dictated by the respective numbers of occurrences of bad and good times. According to our characterization, there are respectively 30% and 37% percent of bad times in France and Italy. These shares fall to 23% and 21% if we add one standard deviation instead of half of it. In this case (with an addition of one standard deviation to the mean), comparison with good times would be fragile because of a rather limited number of occurrences for bad times. The threshold is then 9.1% for France and 10.5% for Italy. Periods when the unemployment rate is below the threshold are characterized as good times whereas those when it is above the threshold are characterized as bad times.

The context-dependent fiscal multipliers are presented in Figure 3. For France, there is a significant difference between bad and good times: the fiscal multiplier in bad times is 0.7 at impact and grows to above one for several quarters. It is also rather persistent as it remains statistically different from zero for up to 10 quarters. The multiplier in good times is substantially lower at 0.3 at impact and rising slowly to 0.4 after three quarters. Moreover, it vanishes quicker. After one year, the effect is not statistically different from zero. The state-dependence of the fiscal multiplier in France is consistent with results reported in Herbert (2014) but at odds with those found in Bouthevillain and Dufrénot (2011). The lack of a consensual outcome in France continues, as it does in the United States where Auerbach and Gorodnichenko (2012) conclude in favor of context-dependent multipliers when Ramey and Zubairy (2018) conclude the opposite.

In Italy, however, the difference between bad and good times is not very visible. The fiscal multiplier is positive at around 0.5 in the short run during good times but becomes statistically



(a) France (slack =  $U > 9.1\%$ )



(b) Italy (slack =  $U > 10.5\%$ )

Figure 3: State-dependent impulse response functions

indistinguishable from zero after three quarters. During periods of slack, Italy's fiscal multiplier is 0.2 at impact, but is never statistically different from zero. The large confidence intervals do not allow to conclude in favor of state-dependent multipliers in Italy. Part of this may be attributed to the small Italian sample, which only starts in 1999.

The limited fiscal multipliers for France and Italy stand in contrast to some recent estimated effects of fiscal policies in the European Union, but in most cases, these estimates relate to targeted fiscal policies like recovery or investment plans (see, e.g. Barbero et al. (2024), Canova and Pappa (2021), or Durand and Espinoza (2021)). The relatively low value of fiscal multipliers could be attributed to the mix of spending and taxes during fiscal expansions in France. France relies more on tax cuts than on spending increases during fiscal expansions, and the tax multiplier is generally found to be lower than the spending multiplier (see Gechert and Rannenberg (2018))<sup>12</sup>. In the case of Italy, one can interpret the low and short-lived fiscal multipliers in connection with the high debt-to-GDP ratios. Corsetti et al. (2012) and, more recently Huidrom et al. (2020), argue that fiscal multiplier effects are conditional on the initial public debt levels: the high debt-to-GDP ratio (or the weak fiscal position to take the words of Huidrom et al. (2020)) in Italy may have weighted on the effectiveness of fiscal policy.

## 5 Conclusion

In this paper, we have presented a conceptualization of potential output as maximum capacity utilization rather than an average output level, as conventionally assumed. Based on this framework, our analysis yields substantially larger output gaps for most of the sample for France and Italy as compared to the European Commission’s estimations. This suggests that the economies were actually running colder than assumed, indicating that a further reduction in unemployment would not have led to an accelerating inflation.

Moreover, this study has shown that fiscal policy had real effects in France and Italy. Our findings contribute to policy debates in two ways. First, while they are based on actual fiscal policies implemented in France and Italy, rather than theoretical simulations from macroeconomic models, they highlight significant cross-country differences in fiscal multipliers. They demonstrate that the effect of fiscal policy is not uniform across otherwise quite similar economies.

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<sup>12</sup>The assessment of France’s fiscal stimulus following the global financial crisis indicates that, although spending increases and tax cuts were initially planned to contribute equally, each accounting for about 50%, the implementation of spending measures fell short of expectations, whereas the tax cuts were fully executed (see Cour des Comptes (2010)).

Second, our analysis emphasizes the state-dependent nature of fiscal multipliers in the case of France but not in the case of Italy. In France, fiscal multipliers tend to be larger during economic downturns, when there is slack in the economy, compared to periods of high capacity utilization. This aligns with existing research suggesting that fiscal stimulus is more effective when resources are underutilized (see Auerbach and Gorodnichenko (2012)). The differences observed between France and Italy further suggest that labor market rigidities, and initial public debt ratios may play a crucial role in shaping fiscal policy effectiveness.

Overall, our results reinforce the idea that fiscal policy can have stabilizing effects, particularly when implemented in times of economic distress. However, the significant variation across countries highlights the importance of tailoring fiscal measures to national economic conditions rather than assuming a one-size-fits-all approach. This conclusion holds symmetrically: in light of the different fiscal multiplier effects across France and Italy, there is no one-size-fits-all approach for fiscal consolidation, as the recent reform of the European Stability and Growth Pact acknowledged (see e.g., De Lemos Peixoto and Loi (2024) or Menguy (2024b) for a review).

While the current study has focused only on two countries, there is scope for further applications to other countries. These applications remain conditional on the availability of quarterly data over a sufficiently long period of time though.

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## 6 Appendix

### 6.1 Quarterly output gap graphs

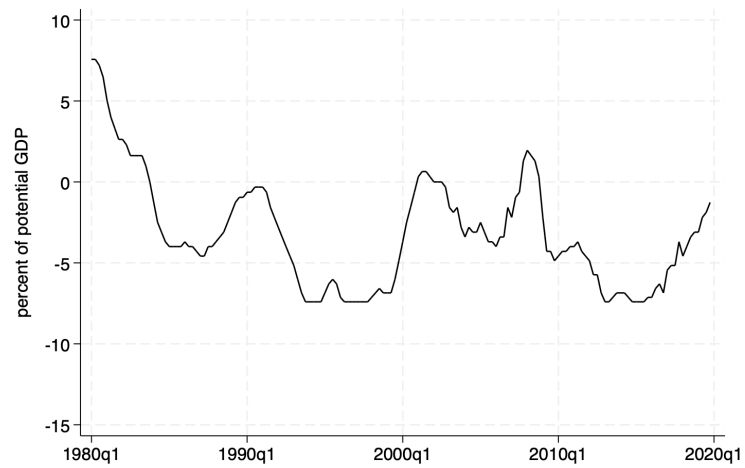


Figure 4: Output gap France

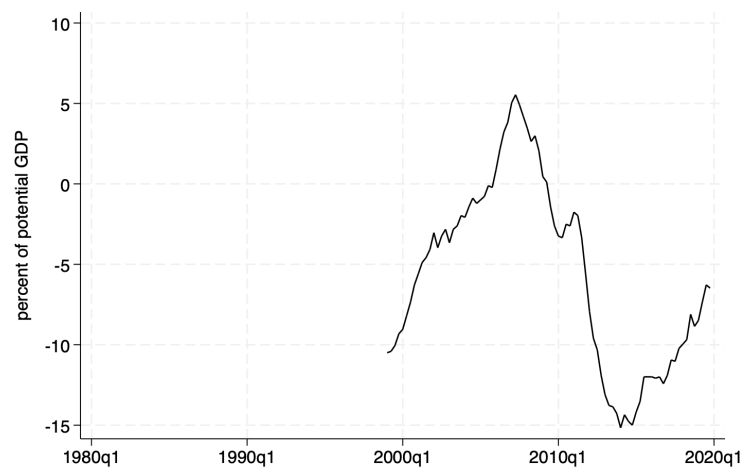


Figure 5: Output gap Italy

## 6.2 Tests for endogeneity of the fiscal stance

|                                       | Fiscal stance    |                  |
|---------------------------------------|------------------|------------------|
|                                       | France           | Italy            |
| L.Output gap                          | 0.015<br>(0.013) | 0.028<br>(0.019) |
| Constant                              | 0.039<br>(0.078) | 0.200<br>(0.130) |
| Observations                          | 159              | 83               |
| R-squared                             | 0.006            | 0.029            |
| Robust standard errors in parentheses |                  |                  |
| *** p<0.01, ** p<0.05, * p<0.1        |                  |                  |

Table 5: Regression of change in structural budget balance on lagged output gap

| lags( $\rho$ ) | F     | df       | Prob > F |
|----------------|-------|----------|----------|
| 1              | 1.426 | (1, 155) | 0.2343   |
| 2              | 2.476 | (2, 154) | 0.0874   |

Table 6: Breusch-Godfrey LM test for autocorrelation for France

Notes: The Breusch-Godfrey test is used to detect autocorrelation. The null hypothesis of the test is that there is no serial correlation. Here, the no serial correlation hypothesis cannot be rejected at a 10% level for one lag and at a 5% level for two lags.

| lags( $\rho$ ) | F     | df      | Prob > F |
|----------------|-------|---------|----------|
| 1              | 0.882 | (1, 79) | 0.3506   |
| 2              | 1.181 | (2, 78) | 0.3124   |

Table 7: Breusch-Godfrey LM test for autocorrelation for Italy

Notes: The Breusch-Godfrey test is used to detect autocorrelation. The null hypothesis of the test is that there is no serial correlation. Here, the no serial correlation hypothesis cannot be rejected at a 10% level for one lag and two lags.



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