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FRANCE

SELECTED ISSUES

July 2019

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July 1, 2019

Approved By
European Department

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CONTENTS

THE APPROPRIATE FISCAL STANCE IN FRANCE: A MODEL ASSESSMENT[1]

Public debt in France has risen from 20 percent of GDP in 1980 to almost 100 percent by 2018. In this context, it is timely to ask how France got there and what is the appropriate fiscal policy stance over the next few years. To inform this policy discussion, this note uses a theoretical model that explicitly accounts for the trade-offs between the objectives of output stabilization and debt sustainability. The analysis suggests that fiscal policy in France has not sufficiently accounted for debt sustainability considerations over the past 40 years. While considerations outside the scope of the model would also need to be considered to form a concrete policy recommendation, the analysis suggests that a (relatively-frontloaded) fiscal tightening would be appropriate at this time.

1. This paper analyzes France's fiscal stance using a structural stochastic model. The theoretical model features a forward-looking benevolent government that needs to decide the optimal fiscal stance given the level of public debt, the cyclical position of the economy, and expectations about future shocks (Section A). The model is first used to investigate France's historical fiscal stance (section B) and then to assess the appropriate fiscal path going forward (Section C).

A. Modeling the Fiscal Policy Stance

2. The fiscal policy stance is assessed with a model whereby a forward-looking government maximizes utility under a debt constraint.[2] The model aims to strike a balance between the objectives of economic stabilization and debt sustainability. The government decides the fiscal stance, defined as a change in the structural primary balance, singling out the discretionary policy. Several features are noteworthy:

- **Feedback effects between fiscal policy and output are explicitly considered**: the primary balance has an effect on output (the fiscal multiplier), and the output has in turn an effect on the primary balance (automatic stabilizers). The fiscal multiplier is cycle dependent (larger during recessions).

- **Economic output is affected by exogenous shocks**, which can persist for some time. Recessions reduce potential output, reflecting human and physical capital losses of economic downturns (hysteresis effect).

[1] Prepared by Jean-Marc Fournier (FAD).

[2] This section provides a brief description of the main features of the model. For a more detailed discussion, see Appendix I and Fournier (2019).

- **Stabilizing role of fiscal policy is constrained by adverse effects of higher debt and implementation issues.** The interest rate is a rising function of debt and, at high debt levels, the government faces a stochastic risk of losing market access.[3] In addition, the implementation of fiscal policy is not straightforward. As fiscal policy is subject to an implementation lag, the government decides its fiscal stance one year ahead in the model. The government does not know the position in the cycle in real time and can only forecast it. Moreover, changing fiscal policy entails a cost, reflecting implementation costs of spending reforms or tax uncertainty costs.

3. The model provides an optimal fiscal stance that depends on lagged output gap and debt:

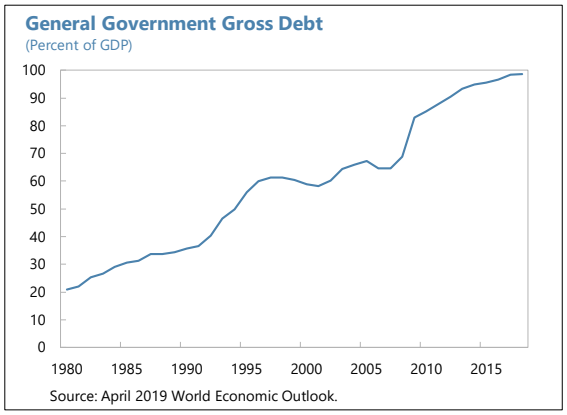
- **Governments should smooth the cycle.** Counter-cyclical fiscal policy dampens recessions and avoids distortions during overheating, improving short-term utility.

- **Governments facing macroeconomic shocks need to react to rising debt to preserve buffers.** A low debt level is like a buffer, as the government has the possibility to increase debt in case of a shock without paying excessive interest rates or facing market-access risk. The government should thus generate surpluses to restore buffers when public debt is high.

- **Highly indebted governments should react less to shocks.** The debt buffer (the difference between current debt level and levels at which debt is too much at risk) has an insurance value—it is the "reserve" of debt that the government can issue to smooth shocks. When the buffer is small, the probability of market stress is high and the marginal value of an extra unit of buffer is large. This provides an incentive to preserve buffers to guard against future shocks. As a result, when debt is high, the optimal policy response to offset a negative shock is smaller than when debt is low.

B. Fiscal Policy Through the Lens of Time

4. France's public debt has been on an almost uninterrupted upward trend over the past four decades. Despite several consolidation attempts (Virage de la Rigueur in the 1980s, medium-term consolidation in 1994–97 ahead of joining the European Economic and Monetary Union, and fiscal consolidation under the corrective arm of the European Stability and growth Pact in 2003–07 and subsequently in 2011–17), France's public debt has increased by almost 80 percent of GDP since 1980. Rising debt levels have reflected a



[3] With an elasticity of interest rate to debt in line with the empirical literature, a rational government should react to rising interest rates to ensure that the probability to be constrained by a loss of market access is low. Therefore, the parameters of the probability function of the market access risk have limited influence on results.

steep increase in general government expenditures not matched by higher revenues (Martin, Tytell, and Yakadina 2011).

5. A simple test suggests that fiscal policy did not react to increases in debt during this period. The continuously rising debt begs the question whether the government has been implementing correcting measures to counter such a trend. This is what Bohn (1998) proposed to test by assessing the reaction of the primary balance to lagged public debt. A positive reaction means that fiscal policy is sustainable because debt increases are followed by fiscal consolidation. In France, however, higher public debt is associated with lower primary balances. That is, in the face of increasing debt levels, France did not tighten fiscal policy to put debt on downward path. Beyond this descriptive analysis, Bohn (1998) controls for war-time spending and for cyclical fluctuations. There is no substantial war-time spending in the sample and the cycle is taken into account in two different ways: either the output gap is added as a control, or the dependent variable is the structural primary balance that excludes a cyclical component of government spending. In both cases, France does not pass Bohn's sustainability test: the coefficient associated with debt is not statistically different from zero when the whole sample period is considered (Table 1, columns 1 and 3) nor when the post-crisis period is excluded (Table 1, columns 2 and 4).

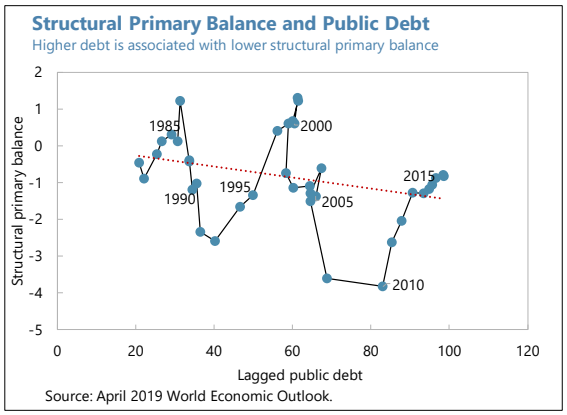


Table 1. France: Bohn Sustainability Test

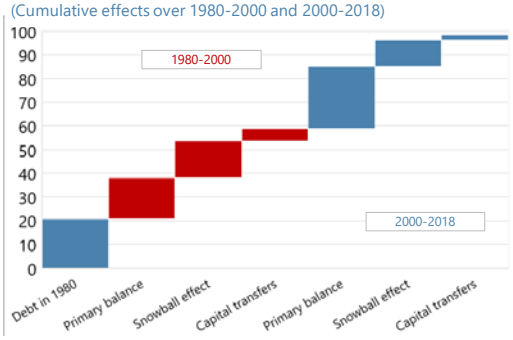
Dependent variable	(1) Structural primary balance	(2) Structural primary balance	(3) Primary balance	(4) Primary balance
Lagged gross public debt	-0.004	0.020	-0.005	0.027
	(0.014)	(0.023)	(0.016)	(0.021)
Gap			0.651***	0.346*
			(0.217)	(0.174)
Constant	-0.575	-1.422	-0.510	-1.823*
	(0.804)	(1.062)	(0.963)	(0.969)
Sample	1981–2017	1981–2007	1981–2017	1981–2007
Observations	37	27	37	27
Rho	0.786	0.762	0.782	0.726
R-squared		0.022	0.428	0.254

Note: Standard errors in parentheses. Prais-Winsten estimator to consider serial correlation. rho is the persistence parameter of the residuals. *** p<0.01, ** p<0.05, * p<0.1.

6. The lack of response to increasing debt levels does not just reflect the fiscal stimulus in response to the global financial crisis (GFC). Clearly, the GFC prompted a large fiscal stimulus

response resulting in high structural primary deficits and debt. However, it should not be regarded as the single reason for higher debt levels, as the link between public debt and structural primary balance was not significant over the period 1980–2007, before the GFC (Table 1, columns 2 and 4). In the same vein, Mauro et al. (2015) find a significantly negative reaction of primary balance to debt with pre-crisis data after World War II (1950–2007). Furthermore, public finance developments in France between 1978 and 2002 were only weakly sustainable (Boissinot and others 2004). First, Boissinot and others found that the rise in revenues only offsets half of the effect of an expenditure shock. Second, any rise in the debt level tends to be persistent, in particular because of a snowball effect through the debt interest burden. The debt increases over the last 40 years can indeed be attributed to both primary deficits and the snowball effect.

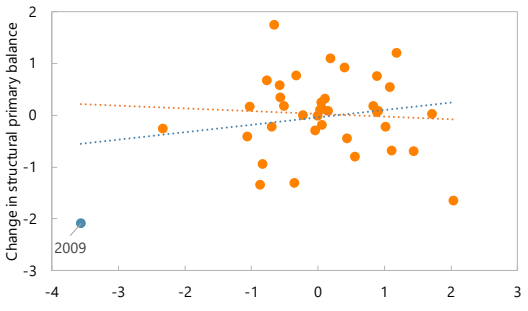
The Increase in Debt: Primary Deficits Magnified by the Interest Payment Snowball Effect
(Cumulative effects over 1980-2000 and 2000-2018)



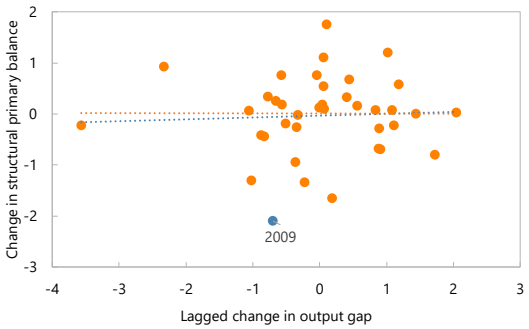
Source: April 2019 World Economic Outlook.
Note: The snowball effect is the contribution of the (r-g).d in the debt dynamic. Capital transfers are all operations that are not reported in the primary balance or as interest payments (e.g. a bailout).

7. Fiscal policy did not respond to cyclical conditions either. To find evidence of a countercyclical fiscal policy response, the fiscal stance (measured as the change in the structural primary balance) is plotted versus the change of the output gap (left panel). Overall, the correlation between fiscal stance and current output gap change is slightly positive, but this weak link is only driven by one event: the large fiscal stimulus implemented in 2009 in the immediate aftermath of the GFC. Without this event, the correlation turns negative. One may wonder if the governments was not able to counter the cycle because it reacts with a delay. However, an alternative plot of the fiscal stance versus the lag of change of the output gap provides a similar conclusion: the fiscal stance did not react to changes in the output gap even with a delay (right panel).

No Association Between Fiscal Stance and the Business Cycle



Source: April 2019 WEO and IMF staff calculations.

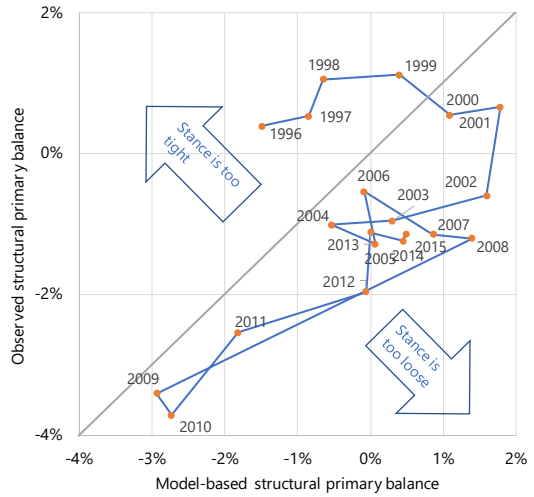


Source: April 2019 WEO and IMF staff calculations.

Note: The red line shows the regression line without year 2009, and the blue line the regression with year 2009. Results would be very similar with real time output gap as revisions affect the level of the output gap, rather than the change.

8. A retrospective model analysis confirms that fiscal policy was generally looser than what cyclical and debt dynamics conditions would have called for. The structural primary balance implemented by the government is compared to the one that the model presented in section A would recommend in order to smooth output fluctuations while preserving debt sustainability. In the figure, an observation on the 45-degree line corresponds to a year for which the government has implemented the fiscal stance recommended by the model. If the primary balance is above (respectively below) the model recommendation, the observation is above (respectively below) 45-degree line and the fiscal stance is too tight (respectively too loose). The analysis shows only one episode for which fiscal stance was too tight according to the model: the fiscal tightening starting in 1996 ahead of joining the euro. After that, in 2000 and 2001, growth was high, but France missed this opportunity to build buffers. This led France to miss the 3 percent of GDP Maastricht deficit ceiling in 2003, while the model would have recommended a more prudent fiscal stance. Overall, France did not build buffers during the great moderation. By contrast, the model suggests that the sharp reaction to the severe downturn in 2009 was broadly appropriate.[4] But during the subsequent years, the government implemented a fiscal consolidation which was slower than the model recommendation.

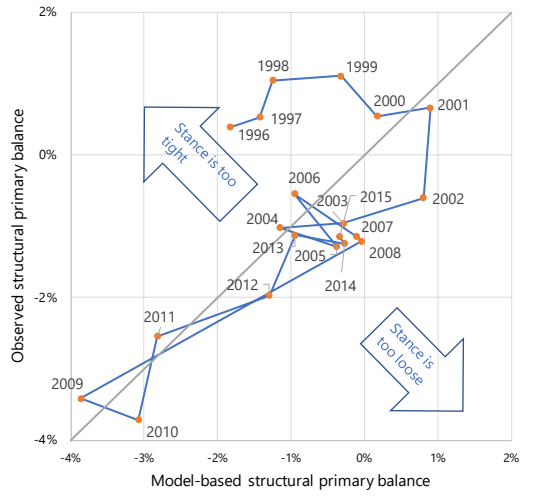
Fiscal Stance has been Easier than the Model Recommendation



Source: WEO and IMF staff calculations.

9. Output-gap measurement bias explains an important part of the deficit bias. The real-time measure of output gap in France has always been negative over the period covered in this retrospective analysis.[5] This can have encouraged the government to run larger deficits. To understand the role of mismeasurement, the model prescription is calculated with the real-time output gap measure instead of the ex-post output gap measure. The model recommendations are shifted to the left, reflecting a somewhat easier fiscal stance because of

Fiscal Stance and Model Recommendations with Real Time Output Gap Measures



Source: April 2019 WEO and IMF staff calculations.

[4] The government decided a fiscal stimulus in December 2008, reflecting the anticipation of a sharp economic contraction. The model set up of a government that does not know the next year's shock is thus too restrictive in this extreme year. The model recommendation has been adjusted to reflect this particular case, making use of the Fiscal Taylor Rule built on the same model (Fournier and Lieberknecht, 2019) and assuming that the government could anticipate an output gap of -4 percent as in the January 2019 World Economic Outlook.

[5] The real-time measure of output gap is obtained from historical IMF *World Economic Outlook* databases.

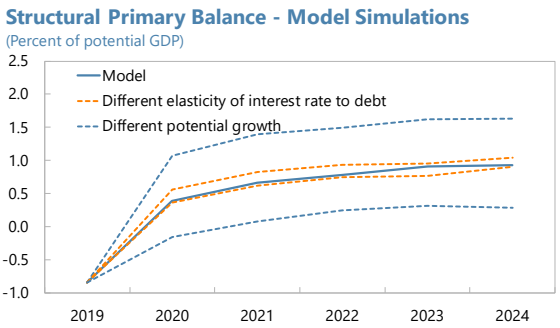
the perception that the economy is in a downturn. This shift illustrates the difficulty to measure the output gap in real time. In many cases, the observations are fairly close to the 45-degree line, suggesting that decisions made in real time could be due to the belief on the position in the cycle. However, since 2000, the realized fiscal stance is still looser than the recommended fiscal stance even when based on real-time output gaps on average. On average, the deficit bias using a real-time output-gap measure is about one-third of that using an ex-post output gap measure over the period 2000–15.

C. Restoring Fiscal Buffers

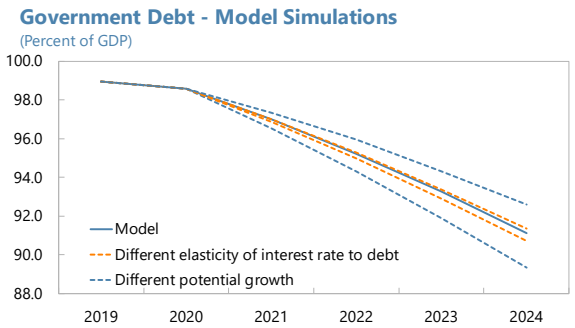
10. Model-based simulations are used to compute the optimal fiscal stance over 2020–24. The model is calibrated to France following Fournier (2019) (Table 2), taking 2019 as given and calculating an optimal fiscal path over 2020–24. The model-based solution is adjusted to consider the ongoing low interest rate environment, in line with staff's baseline projections over 2020–24. Beyond 2024, the interest rate-growth rate difference is assumed to increase linearly over ten years to reach a long-run historical average (see Table AI.2 on model calibration).

11. In the current context of high public debt and a closed output gap, the model recommends a (relatively-frontloaded) fiscal consolidation. Model simulations suggest a consolidation of about 1 percent of GDP in 2020 relative to 2019, reaching a cumulative tightening of slightly less than 2 percent by 2024 (left panel, blue line). The model is illustrative and does not take into account recently legislated and planned fiscal relaxation measures built in staff's medium-term baseline fiscal scenario. The model results are also based on assumptions and calibration choices, and as such, should be interpreted with caution. The model-recommended consolidation path would help put debt on a downward path (right panel, blue line). When the level of debt is high, the marginal gain of reducing debt is large, as it reduces the probability of affecting market access and increases fiscal buffers to offset future shocks. Fiscal tightening is optimal in this case because the long-term gain from debt reduction exceeds the short-term marginal cost of adjusting. The government can implement this tightening with limited macroeconomic risks because the output gap is close to equilibrium.

Fiscal Tightening to Restore Fiscal Buffers



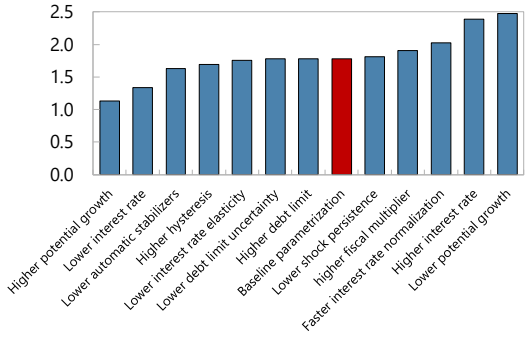
Source: IMF staff calculations.
Note: In the high (respectively low) growth scenario, potential growth is 0.5% higher (respectively lower). In the high (respectively low) elasticity of interest rate to debt, the interest rate increases by 2 basis point (resp. 1 basis point) with one GDP point increase in debt..



Source: IMF staff calculations.
Note: In the high (respectively low) growth scenario, potential growth is 0.5% higher (respectively lower). In the high (respectively low) elasticity of interest rate to debt, the interest rate increases by 2 basis point (resp. 1 basis point) with one GDP point increase in debt.

12. These results are fairly robust to sensitivity checks. The model recommendation to improve the structural primary balance holds under a broad range of assumptions. In particular, the results are not very sensitive to the elasticity of interest rates to the debt level.[6] The results are also not very sensitive to the parameters governing market-access risk (because the optimal policy reacts preemptively to contain the interest rate burden, before being too constrained by the debt limit); the persistence of output growth shocks; the magnitude of automatic stabilizers; or the extent of hysteresis effects. However, the results are sensitive to assumptions on the average interest rate, potential growth, and—to a lesser extent—fiscal multipliers. If growth were permanently higher (lower), the optimal fiscal stance would be easier (tighter) as debt dynamics would become more (less) favorable. If interest rates were higher (by assuming, for instance, faster normalization of monetary policy rates), the model would recommend a tighter fiscal consolidation to counter the risk of debt snowball effects. The recommended consolidation would also be somewhat larger if fiscal multipliers are higher, as fiscal consolidation entails larger output costs and hence the government is more debt-adverse.

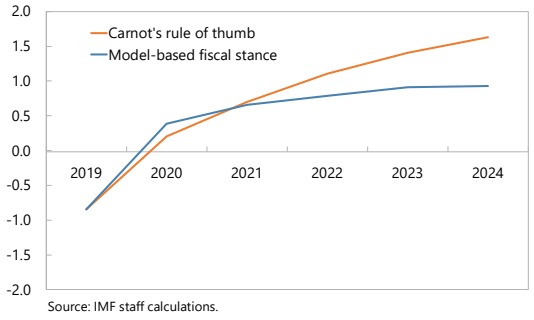
Fiscal Tightening by 2024—Sensitivity analysis
(Percent of GDP)



Source: IMF staff calculations.
Note: In the lower (higher) interest rate scenario, the interest rate is 0.5% lower (higher). In the lower automatic stabilizers' scenario, automatic stabilizers are three fourth of the baseline value. In the lower shock persistence, the persistence parameter is set to 0.4 instead of 0.6. In the faster interest rate normalization, it takes five years after 2024 for the effective interest rate to reach its long-run value. In the lower potential growth scenario, potential growth is 0.5% lower. In the higher hysteresis scenario, hysteresis is 50% larger than in the baseline. In the higher debt limit scenario, debt limit is set at 170 percent of GDP. In the lower debt limit uncertainty scenario, $d_1 = 4$.

13. The model recommendation to consolidate is in line with that of other approaches in the literature, such as Carnot (2014). The rule of thumb proposed by Carnot is based on the average of a primary gap indicator (capturing the effort needed to preserve sustainability) and a macroeconomic score (capturing the cyclical position of the economy). When Carnot's rule is parametrized with the same initial conditions that in the model exercise presented above (that is, high debt, closed output gap, and negative structural primary balance), the output is similar. The rule indicates that the government should tighten fiscal policy by a comparable amount in 2020. However, as Carnot's rule does not internalize the record-low interest rate environment, it recommends a sharper medium-term consolidation than the model.

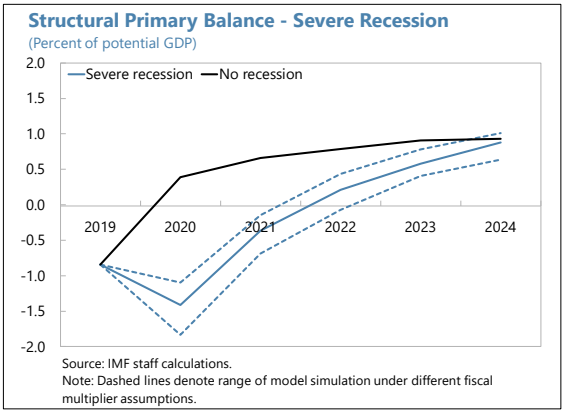
Comparison with Carnot's Rule of Thumb
(Structural primary balance, percent of potential GDP)



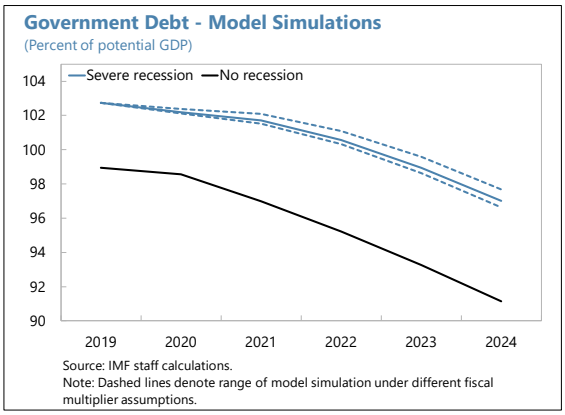
Source: IMF staff calculations.

[6] The reason for the low sensitivity is that a higher elasticity of interest rates to the debt level has two effects that, in this specific exercise, broadly offset each other: (i) it raises the marginal cost of a given increase in debt (leading the government to target a lower debt level); but (ii) it lessens the surplus needed to reduce debt (dampening the debt-aversion effect induced by (i)) because the interest rate burden drops faster when debt declines.

14. The model can also be used to calibrate the policy response in case of shocks. For example, a severe recession is simulated with a one-year shock triggering a decline in annual GDP by 1 percent.[7] This shock fades out progressively, in line with historical fluctuations. In this scenario, a discretionary stimulus around ¼–1 percent of GDP could be considered,[8] which can help to reduce both short-term and long-term costs (hysteresis) of the recession. The size of the stimulus varies depending on macroeconomic circumstances, such as the fiscal multiplier of the instruments used, the hysteresis associated with the downturn, or the cost of financing. In particular, if the government can use an instrument with a higher fiscal multiplier, it can achieve the stabilization objective with a smaller stimulus. In any case, the adverse shock and the stimulus have a permanent effect on debt. There is thus a cost in terms of future consolidation, as the adjustment effort needs to be sustained for a longer period after the shock dissipates. Conversely, fiscal tightening is unambiguously desirable when debt is high and the economy is booming: it reduces debt and avoids overheating at the same time.



Source: IMF staff calculations.
Note: Dashed lines denote range of model simulation under different fiscal multiplier assumptions.



Source: IMF staff calculations.
Note: Dashed lines denote range of model simulation under different fiscal multiplier assumptions.

15. In sum, this note shows that a fiscal consolidation can help build buffers that could help France confront the next downturn from a stronger fiscal position. The analysis highlights that, on average, fiscal policy in France exhibited a deficit bias over the past four decades, being unable to react to either rising debt levels, or cyclical conditions. A model-based analysis further confirms that fiscal policy was generally looser than warranted by cyclical and debt sustainability considerations, and this is only partly due to the fact policymakers need to take decisions based on real-time output gap measures that are subject to uncertainty. Looking forward and taking into account that public debt is high and the output gap is estimated to be closed, the model recommends a fiscal consolidation of slightly less than 2 percent of GDP in the medium run, relatively frontloaded, that would increase the capacity of fiscal policy to offset shocks in the future. While the precise yearly amounts should be interpreted with some caution, given model uncertainty, the recommendation to restore fiscal buffers sooner rather than later is robust to alternative calibrations.

[7] The exogenous process v_t described in the appendix is subject to a one-off exogenous shock of about 4 percent of GDP in 2019. It is dampened by automatic stabilizers, so that growth in 2.3 percent below the baseline. About 40 percent of this shock dissipates each year (autoregressive term in v_t). The government reacts in 2020, reflecting implementation delays.

[8] In 2009, output fell by almost 3 percent and the government implemented a fiscal stimulus of 2.2 percent of GDP.

Appendix I. Model Details[1]

1. The government maximizes household utility by choosing a change in structural primary balance to stabilize output fluctuations intertemporally under constraints. The value function of the government is

$$V_t(d_{t-1}, gap_{t-1}, pb^{st}_{t-1}) = \max_{\Delta pb^{st}_t} E_t[u(c_t, L_t) + \beta V_{t+1}(d_t, gap_t, pb^{st}_t)]$$

where t is the year, d_t is the gross government debt to potential GDP ratio, gap_t is the output gap, pb^{st}_t is the structural primary balance, c_t is aggregate consumption[2], L_t is labor, u(.,.) is the instantaneous utility function and $\boldsymbol{\beta}$ is the discount factor. The state of the economy is summarized by three variables: government debt, the output gap and the structural primary balance. The optimization is subject to the structure of the economy and the government budget constraint that takes the form of a risk to lose market access rising in debt (see below).

2. The value function consists of the per-period utility function u(.) and the expected continuation value discounted by β. The per-period utility function is:

$$u(c_t, L_t) = \frac{{c_t}^{1-\sigma}}{1-\sigma} - \xi {y_t^*}^{1-\sigma} \frac{L_t^{1+\eta}}{1+\eta}$$

which is a standard constant relative risk aversion utility function in consumption and labor where $\boldsymbol{\rho}$ is the parameter of risk aversion. Households enjoy consumption, but also face labor disutility. Utility peaks at an equilibrium output for which the marginal income gain of work equates the marginal loss of utility due to labor. ξ is calibrated so that utility peaks when output is equal to its potential. In other words, utility declines not only if output decrease below its potential, but also if output increases above potential, consistent with the view that positive output gap can be associated with costly distortions. This gives the government a motive to counter output deviations from this potential.

3. The model features rising market pressure when debt is rising. First, the interest rate increases in public debt, with a calibration in line with empirical evidence (Gruber and Kamin 2012; Poghosyan 2012; D'Agostino and Ehrmann 2014; Fall and Fournier 2015; Henao-Arbelaez and Sobrinho, 2017). This sensitivity of the interest rate to debt reflects a higher risk premium, it can be regarded as the consequence of an excess of supply of government bonds. Furthermore, the risk premium increases in the change in debt; investors are more likely to be concerned if debt is rising.

[1] This appendix follows closely Fournier (2019).

[2] Public and private consumption are not distinguished, and hence assumed to provide the same utility.

Symmetrically, even at high debt level, risk premium may be moderate if the government shows its capacity to reduce it. Second, a risk to lose market access rules out unbounded debt paths. The probability to lose market access also depends on the level and the change of government debt:

$$P(lma) = [1 + exp(\, d_1(1 - d_t/\overline{d} - d_2(d_t - d_{t-1})))]^{-1}$$

where d_1 governs the debt limit uncertainty, d_2 governs the effect of a debt change on the risk to lose market access, and $\overline{d}$ is the debt level at which the probability to lose market access is 50 percent (given no change in the debt level). If the government loses market access, the government has to keep debt constant under an adverse scenario of a shock of $d_3\sigma$, where σ is the standard deviation of economic shocks, to be explained below.

4. The budget constraint of the government is governed by a standard debt accumulation dynamic, with a deterministic stock-flow adjustment sf_t that can capture planned one-offs:

$$d_t = \left(\frac{1 + r_0 + \alpha_1 d_{t-1} + \alpha_2 \Delta d_t)}{1 + g_t{}^*}\right) d_{t-1} - pb_t + sf_t$$

5. Output is driven by a long-term exogenous potential growth and hysteresis costs in the long-run. Output is produced by a standard linear production function in labor:

$$Y_t = A_t L_t$$

where A_t is productivity and L is labor. Potential output $\bar{Y}_t$ is the output that would prevail if labor is at its equilibrium level $\bar{L}$:

$$\bar{Y}_t = A_t \overline{L}$$

6. Productivity is affected by a permanent hysteresis effect of crisis. If production is below its perceived potential, unemployed workers can see their skills, their network and their morale all decay (Blanchard and Summers, 1987, DeLong and Summers, 2012).

$$A_t = A\prod_{\tau=1}^{t}\left((1+g_\tau^*)\left(1+h.\left(min(gap_{\tau-1}, h^{th}) - h^{th}\right)\right)\right)$$

where $A = \overline{L} = 1$ and g^* is potential growth that would prevail in the absence of hysteresis.

7. The parameter $h \geq 0$ governs the size of hysteresis, a permanent loss of potential output level, and h^{th} is a threshold below which hysteresis kicks in. The calibrated effect on output level is in line with Mourougane (2017) who finds large hysteresis effects on potential GDP level but no effect on long-run potential growth.

8. The output deviates from its potential because of a process of shocks v_t and because of the primary balance. The sensitivity of the output gap to the primary balance is its derivative with respect to the primary balance, which is set equal to a usual fiscal multiplier m_1 when the economy is at output equilibrium. This is consistent with the literature, which either defines the fiscal multiplier as the effect of level of primary balance (or tax, spending level) on a level of output (or consumption, investment) as in Blanchard and Perotti (2002), or matches first differences on both sides (e.g., Alesina et al. 2015 in the empirical literature or Zubairy 2014 in the modeling literature). The fiscal multiplier depends on the output gap itself, reflecting recent empirical literature on larger multipliers in downturns (Baum et al, 2012; Auerbach and Gorodnichenko 2013), corroborated by modeling with financial frictions (Canzoneri et al., 2016). Indeed, when slack is large, a demand stimulus is more likely to boost output as there is spare production capacity. The additional term governed by coefficient m_2 magnifies the multiplier in downturns:

$$\frac{\partial gap(pb_t, v_t)}{\partial pb_t} = -m_1(1 - m_2 gap(pb_t, v_t))$$

9. The primary balance is the sum of a cyclical component and of a structural component decided by the government:

$$pb_t = pb_t^{st} + a.gap_t$$

where a is an automatic stabilizer coefficient. This defines a two-way relationship between the output gap and the primary balance. An increase in the structural primary balance is a fiscal tightening, this implies a decrease in the output gap. At the same time, a decrease in the output gap reduces tax revenue or increases means-tested transfers, and this implies a decrease in the primary balance. The equilibrium is solved analytically, and an approximation of the solution for small shocks shows that the effect of shocks and of changes in the primary balance are reduced by automatic stabilizers: [3]

$$gap_t \approx \frac{v_t - m_1 pb_t^{st}}{1 + m_1 a}$$

[3] This approximation is a simplified version of the actual formula used in the model. See the appendix and Fournier (2018) for more details.

The structural balance that offsets the underlying shock process is v_t/m_1 in this approximation. It is larger when the fiscal multiplier is lower. It is worth noting that the parameter m_1 captures a causal effect of the primary balance on the output gap. Many authors regard the fiscal multiplier as the causal of a change in the structural primary on output, encompassing the mitigating effect of automatic stabilizers (as in Batini et al. 2014). The multiplier considered in such papers corresponds to $m_1/(1+m_1.a)$.

10. Finally, the aggregate resource constraint is:

$$c_t = y_t(1 - \chi(\Delta pb_t^{st})^2)$$

where c_t denotes aggregate consumption (both private and public), and the last term represents some fiscal adjustment costs, which we model as direct resource costs. These adjustment costs can reflect implementation costs of changes in spending plans, costs associated with tax uncertainty (e.g. Skinner, 1988). This can also reflect the difficulty in reversing fiscal decisions (IMF, 2017). This adjustment cost is relative to output.

11. The calibration used for France is reported in Table 2. Most parameters are taken from Fournier and Lieberknecht (2019) who provide the information used for this purpose. Some parameters reflect cross-country empirical evidence that embed more information than country-specific estimates (e.g. the elasticity of debt to interest rate, or the risk aversion parameter). Some other parameters are specific to France:

Table 2. France: Baseline Calibration

Welfare function	
Discount factor β	0.99
Risk aversion σ	2
Labor elasticity η	1/0.3
Weight of labor ξ	1
Fiscal parameters	
Fiscal multiplier when the gap is null m_1	0.98
Fiscal multiplier sensitivity to shocks m_2	3
Automatic stabilizers (primary balance semi-elasticity to the gap) a	0.61
Adjustment cost χ	3
Interest rate and debt parameters	
Growth-adjusted interest rate at current debt level	1.04%
Effect of debt level on the risk premium α_1	1.5%
Effect of debt change on the risk premium α_2	0.5%
Debt level at which the risk to lose market access is 50% $\overline{d}$	150%
Debt limit accuracy d_1	3
Effect of debt change on the risk to lose market access is d_2	1
Adverse scenario coefficient in case of loss of market access d_3	-1%
Economy parameters	
Potential GDP per capita growth	1.0%
Shock persistence ρ	0.59
Shock size σ	2.4%
Hysteresis	10%
Hysteresis threshold	-1%

- The potential growth assumption is an average of WEO potential growth over 2017–21. The growth interest rate differential is calibrated with 20-year averages of historical data. Shock parameters (size σ and persistence ρ) are estimated with past shocks reflecting the output gap and the primary balance:

$$v_t = \left(gap_t - \frac{1}{m_2}\right) e^{-m_1 m_2 pb_t} + \frac{1}{m_2}$$

- The fiscal multiplier calibration reflects openness, labor market rigidities and the absence of country-specific monetary policy (fiscal multiplier). These elements are combined with a bucket approach that consist in a linear combination of these elements inspired by Batini et al. (2014).

- The automatic stabilizer coefficient is taken from Price et al. (2015).

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THE ROLE OF SUBNATIONAL FISCAL POLICY, INSTITUTIONAL, AND SOCIO-POLITICAL FACTORS IN SUCCESSFUL FISCAL CONSOLIDATIONS—LESSONS FOR FRANCE[1]

International experience suggests that successful fiscal consolidations require strong coordination of fiscal policies across all government levels. Greater fiscal autonomy of subnational governments, supported by adequate (own) revenues and well-designed fiscal rules, can increase their fiscal accountability and responsibility, and, thus, the prospects for achieving a successful fiscal consolidation. Greater political cohesion and lower inequality also influence successful consolidations. These lessons could be helpful for the design of fiscal policies in France, as it strives to reduce its general government deficit over the medium term.

A. Context

1. The global financial crisis (GFC) has affected the public finances of OECD economies at all government levels (Figure 1, top panels)**.**[2] Central government finances have been the most affected, due to the loss in revenue and the increased expenditure associated with the financial and real sector support (Figure 1, middle right panel), although subnational governments were also impacted. As a result, in advanced OECD economies, the general government (GG) debt increased on average by about 30 percentage points of GDP between 2007 and 2017. [3] France experienced a somewhat similar trend, although the contribution of subnational governments has been historically lower (Figure 1, middle left and bottom left panels).

2. Following the crisis and given the sharp rise in public debt levels, many countries adopted fiscal consolidation measures (IMF 2016, 2018). Fiscal consolidation efforts started in 2009, leading to a decline in central government deficits, and, to a lesser extent, subnational government deficits (Figure 1, middle right). However, in several cases, the implementation of consolidation measures was hindered by the fragile economic recovery, increasing inequality, and political fragmentation. In the case of France, the central government deficit was already larger than the OECD median before the crisis, and the rate of post-crisis improvement slowed after 2013, leading to a gap relative to peers in recent years. The recovery in subnational government balances, while somewhat slower than peers, has caught up with them in recent years (Figure 1, middle right and bottom right panels).

[1] Prepared by Aleksandra Zdzienicka (FAD).

[2] Unless indicated otherwise, the central government also includes extrabudgetary units but excludes social security funds. The subnational government consists of all government units of states, provinces, regions, municipalities, and villages.

[3] Our sample consists of 22 OECD countries: Austria, Australia, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Japan, the Netherlands, New Zealand, Norway, Portugal, Slovak Republic, Slovenia, Spain, Sweden, the United Kingdom, and The United States.

3. These developments have renewed interest in the role of not only central but also subnational, institutional, and socio-economic factors in influencing the success of fiscal consolidations. The literature has typically focused on consolidation measures at the central government level (Alesina and other 2012, IMF 2014), while less has been said about the role of other government levels (Gbohoui and others 2019). In theory, subnational factors could either support or hinder central government consolidation efforts (Foremny and others, 2017). On the one hand, fiscal adjustment at the GG level could be more easily achieved by reducing fiscal resources for subnational units, rather than by adopting politically costly measures at the central level (Darby and others 2005). On the other hand, in more fiscally decentralized countries, subnational governments could hamper the implementation of consolidation measures by not adhering to spending objectives at the GG level, including because of weak political cohesion, inability to reduce transfers, or weak rules that are unable to constrain the accumulation of local government debt (Blochliger 2013; Boadway and Eyraud 2018).

B. The Role of Fiscal Policy, Institutional and Socio-Political Factors in Successful Consolidations—A Cross Country Empirical Analysis

4. This paper aims at assessing the role of subnational, institutional, and socio-economic factors in successful fiscal consolidations using a cross-country panel regression analysis.

- **Successful fiscal consolidation episodes are defined as large contractionary fiscal adjustments associated with a substantial debt reduction** (Alesina and Perotti, 1995; Alesina and Ardagna 2009, 2012). Fiscal policy is considered contractionary when the cyclically-adjusted balance substantially increases to reduce debt rather than reflect economic fluctuations. Here, the success of a contractionary policy is assessed by a large reduction in the debt-to-GDP ratio three years after the beginning of fiscal consolidation episodes, to avoid classifying as 'successful' episodes followed by policy reversals.[4] According to this definition, during 1990–2016, more than 40 percent of contractionary fiscal adjustment episodes led to a significant debt reduction (Figure A1 in Appendix).

- **Fiscal policy at different government levels is measured by the fiscal policy stance adopted by the central and subnational governments**.[5] To focus on discretionary policy actions, rather than adjustments driven by economic fluctuations, the fiscal policy stance is computed as a cyclically-adjusted fiscal impulse (Appendix).[6] Institutional factors include the degree of fiscal decentralization (e.g., share of GG spending executed through or revenue

[4] This identification strategy focuses on fiscal consolidation episodes that resulted in a substantial and sustained reduction in the debt level. In other words, it excludes fiscal consolidation episodes followed by the policy reversals and those affected, for instance, by adverse economic developments (e.g., GDP growth collapses and/or interested rate spikes).

[5] The central government includes extrabudgetary units. Depending on administrative set-ups, the subnational governments include all government units of states, provinces, regions municipalities, and villages.

[6] For the analytical analysis, a cyclically-adjusted change in the Social Security Fund balance enters as a control. First, because some countries in the sample do not have such a fund. Second, the 'fiscal policy stance' of the social security fund reflects central government decisions.

collected by the subnational units) and the existence of fiscal rules at the different government levels. Policy cohesion is measured by the number of votes that the government won in the national (federal) and subnational elections. The signs of the regression coefficients capture policy coordination. Income inequality and unemployment dispersion across regions capture socio-economic characteristics.

- **The probability of a successful fiscal consolidation is estimated using an unbalanced panel probit model with the standard errors clustered at the country level**. Other controls include variables that could affect fiscal adjustment or consolidations such as the initial level of public debt, economic (e.g., GDP growth, inflation) and financial conditions (e.g., long-term interest rates). Global shocks are captured using time-fixed effects. The sample includes 22 OECD countries over the period 1990–2016 and is mainly driven by the availability of fiscal decentralization data.

5. The regression results indicate that successful fiscal consolidation episodes are associated with a supportive fiscal policy stance at both central and subnational government levels.[7] In particular, a contractionary fiscal policy impulse at both levels—which indicates the policy alignment or coordination—increases the probability of a successful fiscal consolidation (Table 1 column I). The supportive role of the subnational government is not only a result of lower central transfers (column II) but also of the alignment of their own fiscal policy stance to the central level. Specifically, a tighter fiscal policy stance measured by the adjustment of the subnational government own spending to own resources is found to have a positive and statistically significant impact on the success of fiscal consolidation (column IV). Income inequality across regions and political cohesion across government levels have no direct effects on fiscal consolidation success but indirectly increase the contribution of central and subnational fiscal policy, as will be detailed below.

6. The role of subnational fiscal policy has increased since the GFC. First, compared to the central government policies and transfers, the impact of subnational fiscal policy on fiscal consolidation has been increasing over time. This finding is in line with a general trend of increasing fiscal decentralization across OECD countries. Second, the effect of subnational fiscal policy on fiscal consolidation has statistically increased after the GFC with the beginning of fiscal stabilization efforts in 2009 (Figure 2, top left panel).

7. Greater decentralization increases the role of subnational governments in a successful fiscal consolidation. The impact of subnational fiscal policies on the probability of success of fiscal consolidation is larger in countries with greater revenue decentralization—measured by the ratio of subnational government taxes to general government taxes (Figure 2, middle left panel)—which could indicate that subnational governments are more accountable in this case. Successful

[7] The analysis is based on the panel probit regressions. The coefficients reported in Table 1 indicate a direction of the effects of fiscal policy stance at a different level of governments. Column III illustrates the magnitude of the impact. For instance, a tighter fiscal policy stance at the subnational level by one increase the probability of successful fiscal consolidation by 0.8. Similarly, a decline in transfers from central to subnational governments by one increase the probability of a successful fiscal consolidation by the same magnitude. See Appendix for details.

consolidations are equally supported by a higher expenditure decentralization. However, the composition of subnational spending is important (Figure 2, bottom panel): the role of subnational fiscal policy is significantly larger in countries with a larger share of health or education spending executed by subnational units, while the size of capital spending does not have statistically significant effects, perhaps because it is often excluded from fiscal rules.

8. Fiscal rules raise the chances of a successful fiscal consolidation. The results indicate that fiscal consolidations are more successful in countries with fiscal rules at both the central and subnational government levels (Figure 2, top right panel). A few factors can explain this finding (IMF, 2009). The existence of fiscal rules provides a legal basis and an enforcement mechanism to discipline fiscal policy and increase the credibility of fiscal policies. From the subnational government perspective, the existence of a fiscal rule plays a disciplinary role alleviating a soft budget constraint and reducing the common pool problem (IMF, 2019).[8] Finally, the adoption of fiscal rules helps provide greater coordination of fiscal policy across government levels, provided that the rules are well designed and binding on local governments.

9. Greater political autonomy and cohesion strengthens the role that subnational fiscal efforts play in successful consolidations. The effect of a given fiscal effort by subnational governments in the likelihood of a successful fiscal consolidation is increased when subnational units have greater 'autonomy' in the decision-making process (Figure 2, middle right panel).[9] Similarly, greater political cohesion, measured by the number of votes that the ruling party won in subnational elections, also increases the effect of subnational fiscal policy on the likelihood of fiscal consolidation.

10. The role of fiscal policy in the success of fiscal consolidation increases in countries that are more redistributive and have lower regional income disparities. The regression results suggest that the impact of central government fiscal policy on the probability of a successful fiscal consolidation is statistically larger in countries in which fiscal policy plays a larger role in addressing market income inequality (Figure 3, left panel).[10] This could be because in more redistributive countries, there is more social cohesion and support for consolidation policies when needed. The analysis suggests that more redistributive countries tended to adjust their social spending relatively more than other countries, consistent with the finding in the literature that transfer-based fiscal adjustment tends to

[8] The common pool problem occurs as subnational governments share the resources funded by taxpayers of other jurisdictions through central transfers and thus may fail to internalize the full cost of their spending.

[9] 'Autonomy' is measured using a composite indicator that accounts for the existence of the legal framework, the possibility of self-organization, independence of the spending and revenue allocation decisions, the degree of independence from the central government's control and the influence on the central government decisions by the subnational governments (Ladner and others, 2015).

[10] The role of the central government fiscal policy in successful fiscal consolidations, however, does not depend on the level of gross (i.e., before taxes and transfers) income inequality (Figure 6, left panel).

be more long-lasting (Alesina and others, 2017).[11] In a similar vein, the role of subnational government fiscal policy in influencing the likelihood of successful fiscal consolidations is higher in countries with lower net regional inequality (measured by the dispersion of post-tax and transfer income across regions; Figure 3, right panel).

C. Implications for France

11. A few episodes of fiscal consolidation adjustments in France since the 1990s have not been able to lead to a sustained reduction in public debt. France registered three episodes of large positive adjustment of the general government balance in 1996, 2011, and 2012 (Appendix, Figure A1). But none of these adjustments constitute successful fiscal consolidations as defined in this study, as they did not lead to significant and durable reductions in the level of general government debt.[12] To compare the role of subnational fiscal policy, and other factors in France with that in other OECD countries, additional regressions are estimated using episodes of large contractionary fiscal adjustments without taking into account the impact on the debt.

12. The role of subnational fiscal policy in fiscal adjustments in France has increased after the GFC. The regression results suggest a similar impact of the role of central fiscal policy in France relative to other OECD countries in the probability of implementing large fiscal consolidations (Figure 4, left panel). The subnational governments are found to have played a significantly lower role in France relative to other OECD countries. However, their role in the probability of contractionary fiscal adjustments in France has significantly increased since 2009 (Figure 4, right panel). Other factors, such as fiscal rules, decentralization, political cohesion, the degree of redistribution or regional inequality are not found to be statistically significant in France compared to other OECD countries.

13. What does the analysis imply for the design and conduct of fiscal policy in France going forward? First, more efforts to align the fiscal policy stance at both central and subnational levels, including through the use of effective rules, will be essential to achieve a sustained decrease in public debt.[13] The recent experience with the contractual approach with local governments limiting their spending growth to 1.2 percent, which resulted in a notable reduction in their current spending in 2018, is encouraging and will need to be sustained to generate lasting benefits for France's public finances. Second, more decentralization of revenue and spending decisions from the central to local governments, if carefully designed to foster fiscal accountability and responsibility of local governments, while ensuring that fiscal objectives at the local level remain in line with overall

[11] Transfers-based fiscal consolidation (including through reducing social spending) were usually implemented through multi-year plans allowing time to modify social agreements and were less detrimental for growth (Alesina and others, 2017). Countries that relied more on transfers-based adjustment (including through social spending) were usually those with larger redistribution policies. The regression results are available upon request.

[12] In fact, the last episode of successful fiscal consolidation was in the mid-1970s (Alesina and others, 2019), which is beyond the scope of this study (data limitations preclude extending the analysis to the 1970s).

[13] The degree of expenditure decentralization (measured as the share of subnational government own spending to total general government spending) is 36 percent in France compared to an average across OECD countries of 38 percent.

general government fiscal targets, could also help to support fiscal consolidation efforts. Finally, maintaining the redistributive character of fiscal policies to reduce inequality remains desirable.

Table 1. France: Determinants of a Successful Fiscal Consolidation and Contractionary Fiscal Adjustment

Type of adjustment:	Successful Consolidation	Successful Consolidation	Successful Consolidation *(marginal effects)*	Successful Consolidation	Contractionary Adjustment
	(I)	(II)	(III)	(IV)	(V)
Central Fiscal Stance	1.305***	1.589 **	0.041**	3.020***	1.090***
	(0.452)	(0.755)	(0.022)	(0.871)	(0.368)
Subnational Fiscal Stance	6.484***			5.625*	
	(2.248)			(2.821)	
Subnational Fiscal Stance (own spending/own revenue)		37.691**	0.817**		15.755***
		(16.975)	(0.381)		(5.812)
Transfers (+: net increase at the central level)		51.815***	0.813***		3.337*
		(12.179)	(0.276)		(2.293)
Political cohesion lagged)				0.038	
				(0.037)	
Income inequality (lagged)				-0.028	
				(0.049)	
GG Debt/GDP (lagged)	0.004	0 .024	0.001	0.011*	0.000
	(0.005)	(0.016)	(0.000)	(0.007)	(0.004)
GDP growth (lagged)	0.145*	0.740***	0.010***	0.055	0.003
	(0.061)	(0.258)	(0.006)	(0.284)	(0.072)
Long-term interest rate (change)	-0.856***	-2.132***	-0.054***	-0.568**	-0.320**
	(0.261)	(0.654)	(0.014)	(0.284)	(0.124)
CPI (lagged)	3.163	1.665	0.578**	4.480	1.375
	(4.256)	(1.185)	(0.578)	(6.884)	(2.785)
Observations	235	235	235	[173]	235

Note: Table 1 show report the predicted probability based on the panel probit estimates with robust standard errors clustered at the country level based on Equation (6a and b) in Box 1, **except** Column III that reports the population-averaged marginal effects of the estimates in Column II. **Successful consolidation:** a successful fiscal consolidation with a positive large fiscal adjustment and a large reduction of the debt-to-GDP ratio within three years. **Contractionary fiscal adjustment:** a positive change in the cyclically-adjusted overall general government fiscal balance above one standard deviation in a single year**. Central and subnational fiscal policy stance:** a change in the cyclically-adjusted subnational government fiscal balance. **Political cohesion:** percent of votes of the ruling party in central and local elections. **Income inequality:** income dispersion across regions. Significance levels: */**/*** significant at 10, 5, and 1 percent, respectively.
Sources: OECD National Accounts; IMF Fiscal Decentralization, Global Debt, IFS, WEO, Global Debt, and Fiscal Rules Databases; Global Elections Database; the Database of Political Institutions; the National Election Database.

Table 2. France: Determinants of a Contractional Fiscal Adjustment in France vs. OECD Countries

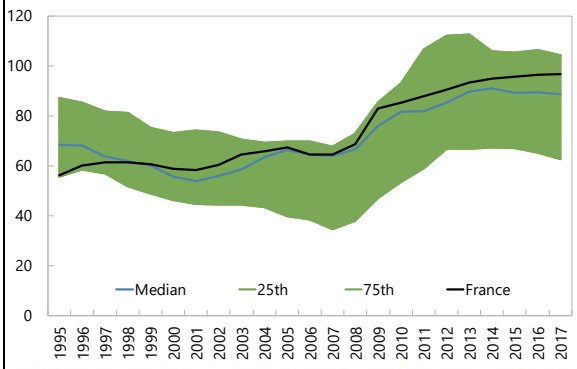
Type of adjustment:	France	OECD countries	France (marginal effect	OECD countries (marginal effect)	Test about the difference in the coefficients
	(I)	(II)	(III)	(IV)	(V)
Central Fiscal Stance	6.974 *	0.989**	0.819*	0.109***	
	(4.964)	(0.411)	(0.603)	(0.026)	
Subnational Fiscal Stance (own spending/own revenue)	12.224*	24.371***	0.486	0.687***	*
	(9.623)	(6.181)	(0.486)	(0.290)	
Political cohesion (lagged)	2.536	11.269*	0.177	0.787**	
	(3.282)	(7.029)	(0.230)	(0.358)	
Political autonomy (lagged)	10.525	19.99*	0.495	0.941***	
	(37.960)	(12.331)	(0.318)	(1.839)	
Income inequality (lagged)	3.600	0.375	0.245	0.025	
	(2.643)	(0.363)	(0.176)	(0.024)	

Note: Table show the predicted probability coefficients and marginal effects estimated based Equation (8) in Appendix. Other control variables are not reported for brevity.
Sources: OECD National Accounts; IMF Fiscal Decentralization, Global Debt, IFS, WEO, Global Debt, and Fiscal Rules Databases; Global Elections Database; the Database of Political Institutions; the National Election Database.

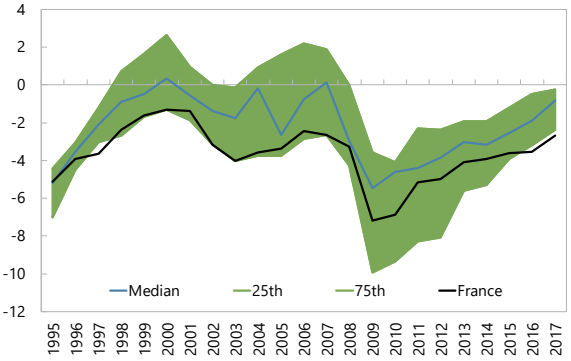
Figure 1. Debt and Fiscal Balance: General, Central, and Subnational Governments

(1995–2017, Percent of National GDP)

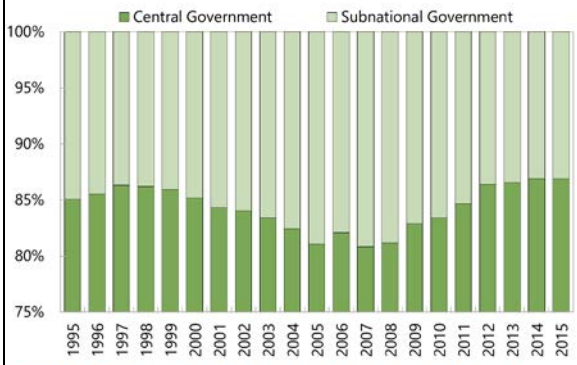
General Government Debt
(Percent of GDP)



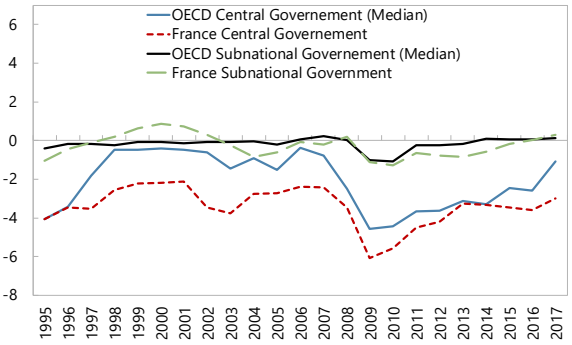
General Government Budget Balance
(Percent of GDP)



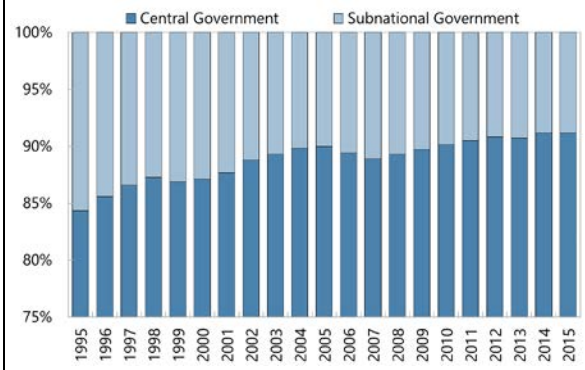
OECD (Median): Contribution to General Government Debt
(Percent)



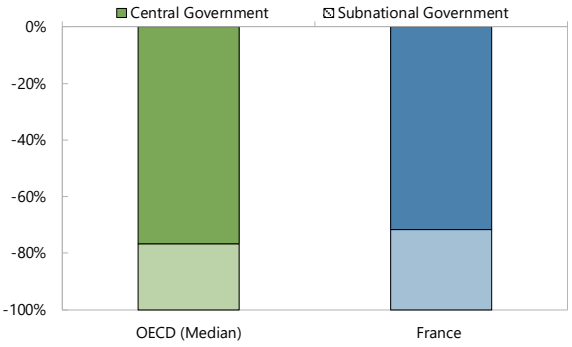
France and OECD (Median): Central and Subnational Government Balance
(Percent of GDP)



France: Contribution to General Government Debt
(Percent)



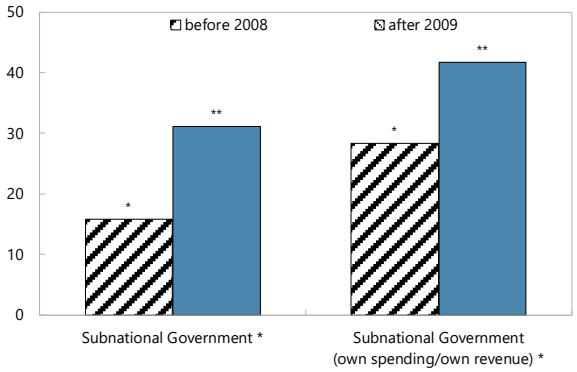
France and OECD (Median): Contribution to General Government Balance 2009-2017
(Percent)



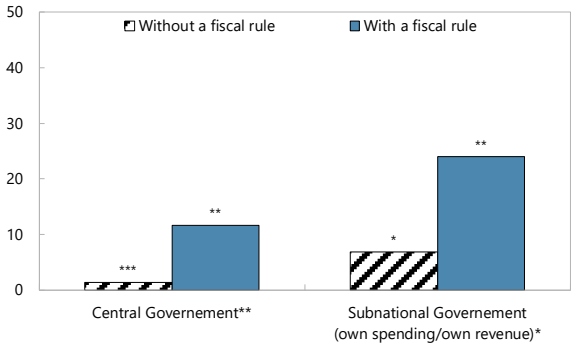
Note: GG includes central government, extrabudgetary units, and social security funds. The middle left and bottom left panels show the contribution (share) of central and subnational government debt to total GG debt. The subnational government consists of all government units of states, provinces, regions, municipalities, and villages. Central and subnational government include net transfers to the central and subnational governments, respectively. Vertical fiscal imbalances are measured as a ratio of own spending to own revenue.
Sources: OECD National Account, IMF GFS, IMF WEO.

Figure 2. Role of Subnational Fiscal Policy in Successful Fiscal Consolidations

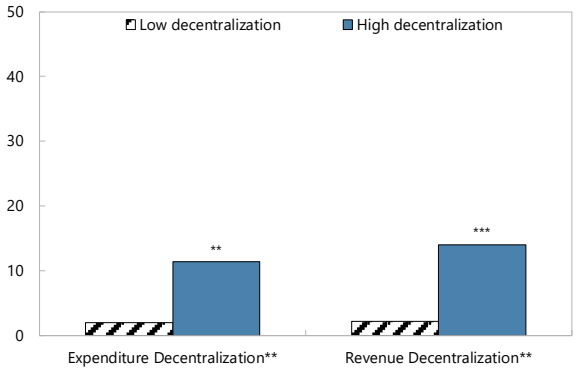
Over Time (After and Before GFC)
(Coefficient Estimates)



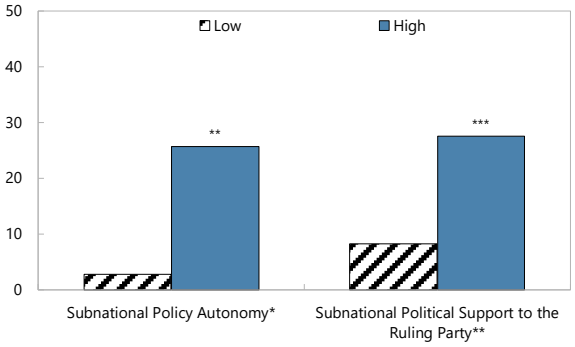
Depending on the Existence of a Fiscal Rule at the Subnational Level
(Coefficient Estimates)



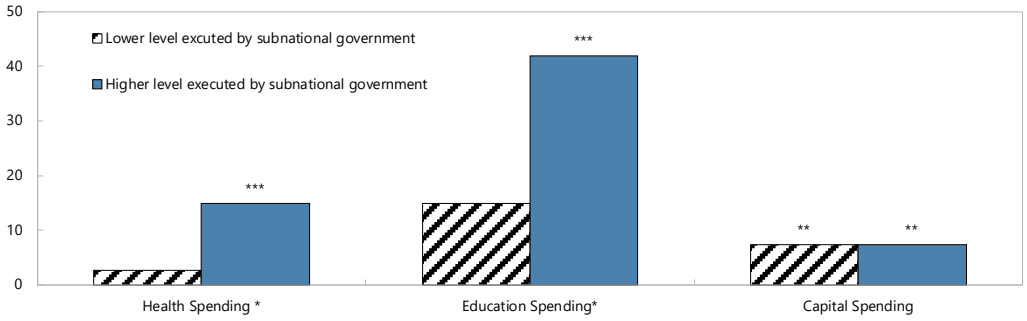
Depending on the Degree of Fiscal Decentralization
(Coefficient Estimates)



Depending on Subnational Political Autonomy and Support to the Ruling Party
(Coefficient Estimates)



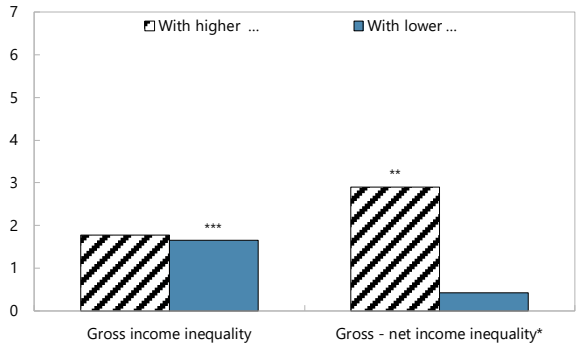
Depending on the Share of General Government Health, Education, and Capital Spending Executed at the Subnational Level
(Coefficient Estimates)



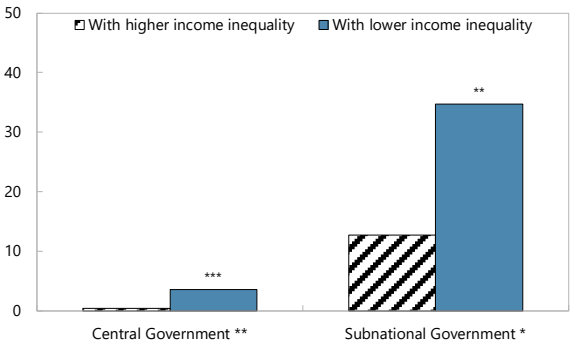
Note: The regression results show the coefficient estimates based on Equation (7). Grey (blue) bars denote the direction of the impact of subnational fiscal policy stance on the probability of a successful fiscal consolidation before (after) GFC, top left panel, and for countries with a lower (higher) level decentralization, middle left and bottom panels, without (with) fiscal rule, top right panel, and with lower (higher) political autonomy or political support for the central government, middle right panel. The test of the equality of the coefficients is reported on the x-axis. ***/**/* indicates significance at 1, 5, and 10 percent, respectively.
Sources: OECD National Accounts; IMF Fiscal Decentralization, Global Debt, IFS, WEO, and Fiscal Rules Databases; Global Elections Database; the Database of Political Institutions; the National Election Database, and IMF staff estimates.

Figure 3. Role of Social Factors in Successful Fiscal Consolidations

Depending on the Share of Income Inequality Smoothed through Redistributive Policies
(Coefficient Estimates)



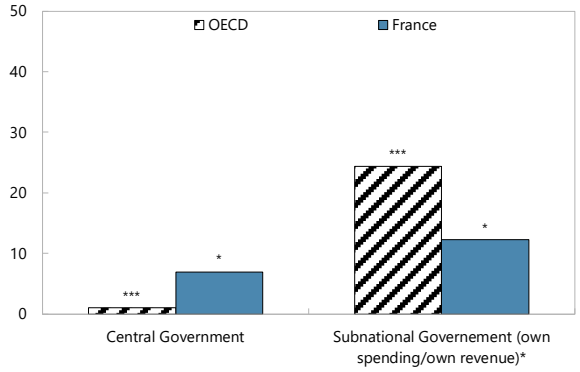
Depending on (Net) Income Inequality at the National and Regional Level
(Coefficient Estimates)



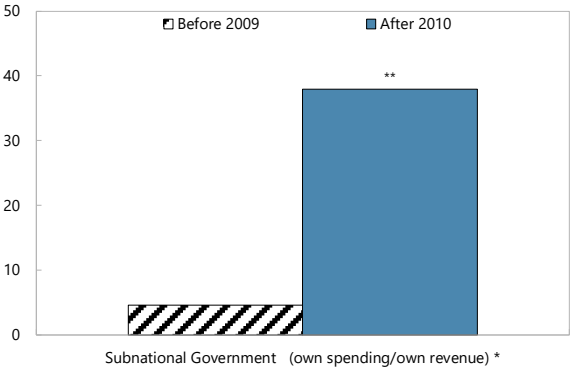
Note: The regression results show the coefficient estimates based on Equation (7). Grey (blue) bars denote the direction of the impact of subnational fiscal policy stance on the probability of a successful fiscal consolidation for countries with a higher (lower) level shares or levels of subnational social factors. The test of the equality of the coefficients is reported on the x-axis. ***/**/* indicates significance at 1, 5, and 10 percent, respectively.
Sources: OECD National Accounts; IMF Fiscal Decentralization, Global Debt, IFS, WEO, and Fiscal Rules Databases; Global Elections Database; the Database of Political Institutions; the National Election Database, and IMF staff estimates.

Figure 4. France vs. OECD: Determinants of Contractionary Fiscal Adjustments

Central and Subnational Fiscal Policy
(Coefficient Estimates)



Subnational Policy in France over Time
(Coefficient Estimates)



Note: The regression results show the coefficient estimates based on Equation (8). Left panel: grey (blue) bars denote the impact of central and subnational fiscal policy to a positive fiscal adjustment for OECD average (France). Right panel: grey (blue) bars denote the impact of subnational fiscal policy to a positive fiscal adjustment for France before (after) 2009. The test of the equality of the coefficients is reported on the x-axis. ***/**/* indicates significance at 1, 5, and 10 percent, respectively.
Sources: OECD National Accounts; IMF Fiscal Decentralization, Global Debt, IFS, WEO, and Fiscal Rules Databases; Global Elections Database; the Database of Political Institutions; the National Election Database, and IMF staff estimates.

Appendix II. Methodological Approach

To estimate the impact of subnational factors on fiscal adjustment, the analysis proceeds in three steps following the approach by, for instance, Alesina and Perotti (1995), Alesina and Ardagna (2009, 2012). First, it identifies the episodes of a successful fiscal consolidation at the national levels based on a 'sizable' positive change of the cyclically-adjusted the GG balance over a year period and a large reduction in GG debt levels three years after the beginning of fiscal consolidation episodes). Second, it examines the effect of subnational fiscal policy, political, institutional, and social factors on these identified episodes of fiscal adjustments and fiscal consolidation episodes. Finally, we extend this approach to estimate whether the impact of subnational factors differs for France compared to other OECD countries.

1. Identifying contractionary fiscal adjustment episodes.

The cyclically-adjusted ('discretionary' component of) the general government (GG), of fiscal impulse *(FI)*, is computed in three steps. First, the GG balance (g_{it}) is regressed on a time trend (τ), the log change in GDP (G_{it}), and country-fixed effects (α_i) (Eq. (1)). Then, the GG balance is computed at the level it would be if GDP growth was the same as in the previous year (Eq. 2). Finally, the fiscal impulse *(FI)* is computed as a difference of two (Eq.3):

$$g_{it} = \alpha_i + \gamma\tau \quad + \beta\Delta logGDP_{it-1} + \varepsilon_{it} \tag{1}$$

$$g_{it}(G_{it-1}) = \hat{\alpha}_{i+}\hat{\gamma}\tau_t + \hat{\beta}\Delta logGDP_{it-1} + \hat{\varepsilon}_{it} \tag{2}$$

$$FI_{it} = g_{it}(G_{it-1}) - g_{it-1} \tag{3}$$

Episodes of large positive fiscal adjustment are identified as 1 if fiscal impulse for a country *i* in a year *t* is more than one standard deviation from the average change in the fiscal impulse for this country (Eq. 4), and zero otherwise:[1]

$$\begin{cases} FA_{it} = 1 \; if \; FI_{it} \geq \mu_i + \sigma_i \\ FA_{it} = 0, \; otherwise \end{cases} \tag{4}$$

Episodes of successful fiscal consolidation (*FC*) are large positive fiscal adjustments associated with a significant decline in the gross GG debt between the beginning of fiscal consolidation and three years later:

$$\begin{cases} FC_{it} = 1 \; if \; FI_{it} = 1 \; and \; \Delta \, GG \; debt_{(t+3)-t} \leq p_{25} \\ FC_{it} = 0, \; otherwise \end{cases} \tag{5}.$$

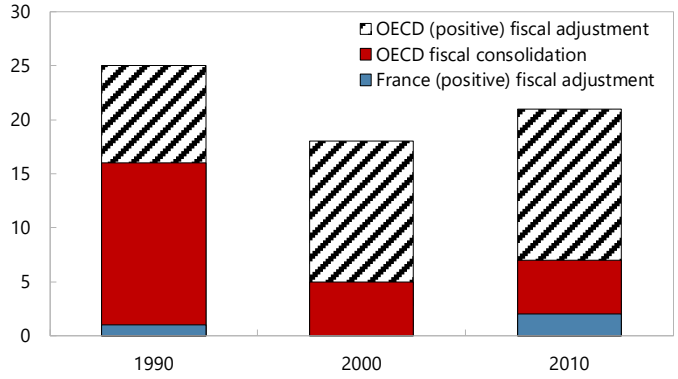
[1] Following Alesina and Perotti (1995), to capture differences between countries the threshold is calibrated separately for each country.

In particular, a successful fiscal consolidation takes a value of 1 if following a contractionary fiscal adjustment, the GG debt declines between t and t+3 is below the 25th percentile of the country distribution over the sample period.

Data availability of subnational fiscal variables limits the estimation sample to an unbalanced panel of 22 advanced OECD economies during the period 1990–2016. Figure A1 illustrates the number of positive fiscal adjustment and fiscal consolidation episodes for the OECD countries and France.

Figure A1. Number of Positive Fiscal Adjustment and Fiscal Consolidation Episodes: for France vs. OECD Countries

(Number of Episodes)



Source: IMF Global Debt and WEO Databases; and IMF staff estimates.

2. Analyzing the role of subnational factors

The following regressions is estimated:

$$y_{it} = \tau_t + \beta_1 CB_{it} + \beta_2 SNB_{it} + \theta Z_{it-1} + \delta y_{it-1} + \varepsilon_{it} \quad \text{(6a)},$$

$$y_{it} = \tau_t + \beta_1 CB_{it} + \beta_2 SNV_{it} + \beta_3 T_{it} + \theta Z_{it-1} + \delta y_{it-1} + \varepsilon_{it} \quad \text{(6b)},$$

where y_{it} is a dummy variable computed using Eq. (5) that takes a value of 1 in the period of a successful fiscal consolidation and zero, otherwise. To capture France experience, a large contractionary fiscal adjustment is used an alternative dependent variable Eq 8. below).

The coefficient β_1 captures the effects of cyclically-adjusted central government fiscal policy stance *(CB)*. The coefficient β_2 captures the impact of subnational government fiscal policy stance with (SNB in Equation 6a) and without net transfers (SNV in Equation 6b). The coefficient β_3 captures the impact of the net transfers from the central to subnational governments. θ indicates the effects of other central and subnational socio-political factors (such as Gini indicators, income and unemployment dispersions across regions), while δ captures the effect of other variables affecting fiscal adjustment or consolidations such as the public debt level, economic (e.g., GDP growth, inflation) and financial conditions (e.g., long-term interest rates). Central and subnational political variables capturing the support of the parliament and subnational government to the ruling (central

government) party are computed as the number of votes (or parliament seats) that the ruling party won in the central and subnational elections. τ_t are time-fixed effects.

Estimates are based on the panel probit estimates with standard errors clustered at the country level. The coefficients included in Table 1 (expect column III) and Figure 2- indicate the predicted probability and are interpreted as the direction of the effects of independent variables (i.e., increasing or decreasing the likelihood of success fiscal adjustment). They can be used to compute the marginal effects using, for instance, an average population to give the impact of a unit (or one percent) change in the independent variable on the probability of a successful consolidation.

The role of subnational (national) factors in shaping the impact of subnational fiscal policy stance on the successful fiscal consolidation is estimated by expanding regression (6) as follows:

$$y_{it} = \alpha_i + \tau_t + \beta_1 CB_{it} + \beta_{2l} D_l SNV_{it} + \beta_{2h} D_h SNV_{it} + \beta_3 T_{it} + \theta Z_{it-1} + \delta y_{it-1} + \varepsilon_{it} \quad (7),$$

where D_l (D_h) takes a value of 1 when a subnational factor is below (above) an average of a country-time adjusted indicator. A similar specification is used to capture the impact of the national factors, as well as over time and before and after the Global Financial Crisis.

3. Analyzing the impact of central and subnational for France

To analyze the impact of subnational factors for France—that has not recorded any episodes of a successful consolidation— compared to other countries, a large contractionary fiscal adjustment is used as an alternative dependent variable. This variable is based on Eq (4) and takes a value of 1 in the period of a contractionary fiscal adjustment and zero, otherwise:

$$y_{it} = \alpha_i + \tau_t + \beta_1 CB_{it} + \beta_{2l} D_{FR} SNV_{it} + \beta_{2h} D_{NFR} SNV_{it} + \beta_3 T_{it}\, \theta Z_{it-1} + \delta y_{it-1} + \varepsilon_{it} \quad (8),$$

where D_{FR} (D_{NFR}) takes a value of 1 for France (other OECD countries). A similar specification is used to test if the impact of the central government fiscal stance, transfers to subnational units, social and political factors, and the impact over time (e.g., before and after the Global Financial Crisis) has been different for France compared to other OECD countries.

4. Data sources

Fiscal variables at general, central, and subnational levels are taken from the IMF Fiscal Decentralization and Global Debt database, OECD National Accounts database, and INSEE. Data for macroeconomic and financial controls come from IMF IFS and WEO databases. The subnational (national) factors are included in the table A1 below.

Table A1. France: Subnational and Central Institutional and Socio-Political Variables		
Factors	**Measures**	**Sources**
Fiscal spending and revenue decentralization	Spending executed, or revenue collected at the subnational level in percent of total general government spending or revenue	IMF Fiscal Decentralization
General government debt		IMF Global Debt
Structure of spending	Health, capital, and other spending executed at the subnational level in percent of total general government spending	IMF Fiscal Decentralization
Debt or budget deficit rules at the central and subnational level	0–1 variables indicating the existence of the rule of not	IMF Fiscal Rule Dataset
Income inequality	Market and net GINI, regional income dispersion	World Inequality Database and OECD Regional Statistics
Other measures of regional inequality	Regional unemployment dispersions	OECD Regional Statistics
Political cohesion at the central and subnational levels	the number of votes that the ruling party won in national (federal) and subnational elections	Global Elections Database, Database of Political Institutions, National Election Database
Subnational autonomy in decision-making process	Composite indicator of the existence of the legal framework, the possibility of self-organization, independence of the spending and revenue allocation decisions, a degree of the independence from the central government control and the influence on the central government decisions by the subnational governments	the European Commission Self-Rule Indicator for Local Government Report (2015)

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POTENTIAL GAINS FROM PRODUCT MARKET REFORMS[1]

While the authorities have recently legislated reforms to liberalize product and service markets and strengthen competition, the evidence suggests that regulation remains more stringent in France than in peer countries. This paper attempts to identify reforms that would lighten product and service market regulation and align France with best-performing countries and quantify the potential long-term macroeconomic gains from those reforms. The analysis based on recent OECD data suggests that efforts focused on simplifying the administrative burden on startups and reducing the state's involvement in business operations and curbing entry barriers in services—especially on retail distribution, sales of medicines, and professional services—can go a long way in bringing France closer to best practices and boosting long-term income per capita.

1. Strengthening competition in product and service markets can help to raise productivity. State intervention can correct market failures in the presence of asymmetrical information (when prices fail to reflect the true quality of a good or service) or in the case of externalities (when the impact of an agent's activity on the well-being of a third party is not reflected in prices). However, excessive product and service market regulation can stifle competition in favor of incumbent firms and service providers and deter new entrants, leading to artificially high prices, hampering innovation, curbing the efficient allocation of resources, and ultimately holding back productivity growth. Several empirical studies document that competition leads firms to be innovative and efficient, which contributes to productivity and high living standards (see e.g. Bouis and Duval 2011, Bourlès et al. 2013 or Conway et al., 2006). Lower prices from stronger competition in the service sector would not only boost households' purchasing power, but also productivity growth in downstream industries that use those services as production inputs (Bourlès et al. 2013; Lanau and Topalova 2016).

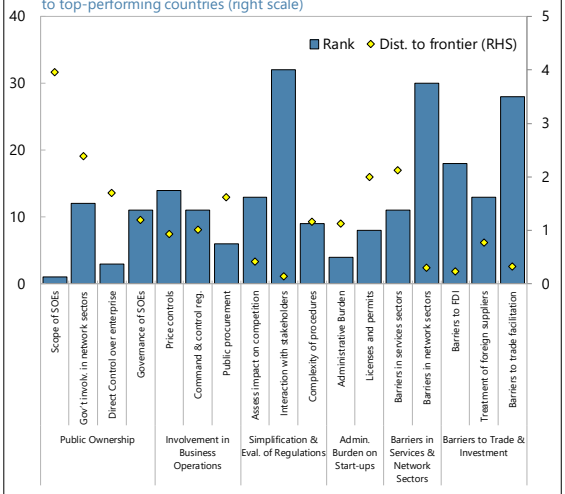
2. France is one of the OECD countries with the most stringent regulation on product markets. France ranks sixth out of 34 countries in the 2018 OECD economy-wide product and service market regulation (PMR) index, where a low-ranking position denotes more stringent regulation (Box 1 and Figure 1):

- *Distortions induced by the state involvement* in the economy are large in France when compared to other OECD countries (ranking in sixth position). Besides the large presence of the public sector in economic activities (especially in terms of the scope of SOEs), the state involvement in *business services* (e.g. through price controls, ownership and territorial restrictions, registration requirements) and the *administrative burden on start-up*s (e.g. the number of mandatory procedures to start a company) stand out when compared to peers, ranking in the eighth and ninth positions, respectively.

[1] Prepared by Simon Voigts (RES).

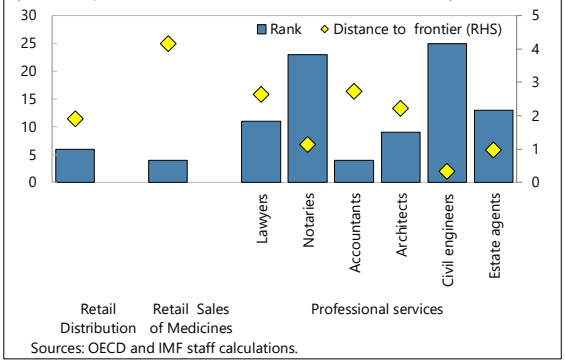
- *Entry barriers in service sectors* (which primarily affect retail distribution, sales of medicines, and professional services) are also pervasive, with France ranking eleventh among OECD countries. The bulk of France's excessive regulation in terms of state involvement in business services and barriers to entry affect retail distribution, sales of medicines, and some professional services (lawyers, accountants, and architects; Figure 2).

Figure 1. Economy-wide PMR Indicators
OECD Rank (left scale, small rank indicates strict regulation), and distance to to top-performing countries (right scale)



Sources: OECD and IMF staff calculations.

Figure 2. Sectoral Indicators for Services Sectors and Retail
(OECD Rank; PMR indicator score difference from frontier countries)



Sources: OECD and IMF staff calculations.

3. To address this, France has enacted important reforms in recent years to lighten regulation. Domestic rail passenger transport has been opened to competition as part of the 2017 reform of the national railway company (SNCF). The recent Business Growth and Transformation Bill (Loi PACTE) provides, among other things, for a reduction in barriers to firm entry; and planned reforms to liberalize personal transport (driving schools and auto parts) and online sales of medicines would also lighten the regulation burden. Earlier examples of regulatory reforms include the 2015 "Macron law," which eased regulation in notary services, extended business hours, and liberalized coach travel, as well as the 2013 "simplification shock" cutting red tape and simplifying firms' interaction with administrative offices.[2] However, some of these reforms aimed at boosting competition may not be reflected in France's 2018 PMR index—for instance, if they were implemented after January 1, 2018, or if they affect a sector not covered by the OECD index.

4. But more could be done to close France's PMR gap regarding the administrative burden on start-ups, the state involvement in business services, and entry barriers in service sectors. Given the distance to best practices, tackling these gaps could be associated with important per capita income gains in the long run. To assess the potential output gains from all these reforms, we use the IMF's Global Integrated Monetary and Fiscal model (GIMF), calibrated to France.[3] The potential economic gains are measured by the simulated impact of hypothetical reforms bringing regulation in line with best-performing countries. We simulate the impact of catching up to the

[2] For details on the reform packages see e.g. IMF country reports number 13/251 and 15/178.

[3] For details see Laxton et. al, 2010.

average of the three best-performing countries (the distance to frontier) in the selected sub-indicators of the economy-wide indicators related to the administrative burden on start-ups, state involvement, and entry barriers in service sectors and, informed by Égert and Gal (2016), assume that a one-point reduction in the aggregate indicator raises productivity by 4.7 percent.[4] The simulations assume that reforms are gradually phased in over a 7-year horizon. We also compute the portion of potential gains that can be realized by curbing regulation that affects retail trade, sales of medicines, and professional services. A few caveats are nonetheless warranted. The PMR index provides only an imperfect proxy for the actual extent of market competition and does not cover every sector in the economy. Moreover, the exercise of attaining best practices in all the selected areas is illustrative and not based on feasibility considerations. Finally, while the mapping from improvements in the PMR index to productivity shocks is based on empirical estimates in the literature, there is a large degree of uncertainty regarding these estimates. The results should thus be interpreted as an indication of the overall magnitude of possible gains and taken with caution.

Table 1. France: Estimated Impact of Hypothetical Reforms

	Scope for improvement in economy-wide PMR indicator	Estimated impact of reaching frontier in service sectors (after 5 and 10 yrs.) *									
		Real GDP		Consumption		Investment		Real wages		Gov. debt/GDP	
		t+5	t+10	t+5	t+10	t+5	t+10	t+5	t+10	t+5	t+10
Distortions Induced by State Involvement											
Involvement in Business Operations											
Retail price controls and regulation	**0.9**	**0.13**	**0.19**	**0.08**	**0.12**	**0.04**	**0.05**	**0.10**	**0.20**	**-0.01**	**-0.08**
Professional services, retail trade, sales of medicines		*0.06*	*0.09*	*0.04*	*0.06*	*0.02*	*0.02*	*0.04*	*0.09*	*-0.01*	*-0.04*
Command and control regulation	**1.2**	**0.16**	**0.23**	**0.10**	**0.15**	**0.05**	**0.06**	**0.12**	**0.25**	**-0.02**	**-0.10**
Professional services, retail trade, sales of medicines		*0.16*	*0.23*	*0.10*	*0.15*	*0.05*	*0.06*	*0.12*	*0.25*	*-0.02*	*-0.10*
Administrative Burden on Start-ups	**1.5**	**0.42**	**0.63**	**0.27**	**0.42**	**0.12**	**0.16**	**0.33**	**0.67**	**-0.04**	**-0.28**
Barriers to Domestic and Foreign Entry											
Barriers to Entry in Services Sectors	**2.1**	**0.29**	**0.43**	**0.18**	**0.28**	**0.08**	**0.11**	**0.22**	**0.46**	**-0.03**	**-0.19**
Professional services, retail trade, sales of medicines		*0.25*	*0.36*	*0.16*	*0.24*	*0.07*	*0.09*	*0.19*	*0.39*	*-0.02*	*-0.16*
Treatment of Foreign Suppliers	**0.8**	**0.11**	**0.16**	**0.07**	**0.10**	**0.03**	**0.04**	**0.08**	**0.17**	**-0.01**	**-0.07**
Professional services		*0.06*	*0.09*	*0.04*	*0.06*	*0.02*	*0.02*	*0.04*	*0.09*	*-0.01*	*-0.04*
Total impact:		**1.10**	**1.63**	**0.70**	**1.08**	**0.32**	**0.40**	**0.85**	**1.74**	**-0.11**	**-0.72**

Source: Staff calculations

Note: Output, consumption and investment are in percent of no-reform output, wages in percent of no-reform wages, and the debt ratio in percentage points.

5. The estimated potential output gain from all these reforms could be up to 1.6 percentage points in the long run (Table 1).[5] About 60 percent of the simulated gains could be achieved by reducing the state's involvement in business operations and barriers to entry in service sectors—three-fourth of which is accounted by regulation of professional services, retail trade, and the sale of medicines—while the remaining gains could be achieved by tackling the administrative burden on start-ups. Consumption would increase due to greater current and future household wealth, despite an increase in the real interest rate (resulting from declining prices in the face of a constant union-wide nominal rate). Investment surges as productivity increases, and net

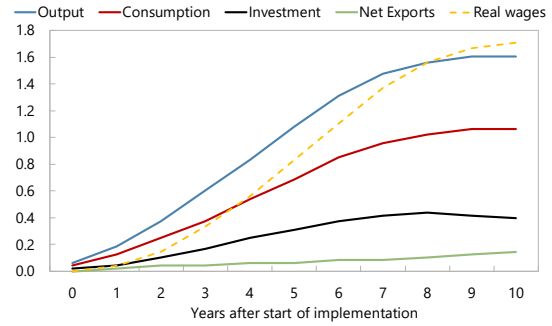
[4] This exercise is broadly in line with other studies in the literature, such as Bourlès et al. (2013), Barnes et al. (2013), and European Commission (2016).

[5] All hypothetical improvements in sub-indicators are modelled in the same way, so the impact on macroeconomic aggregates depends linearly on the distance to frontier in the respective indicator.

exports improve slightly due to a mild depreciation in the real exchange rate. While employment remains broadly stable—higher productivity reduces labor demand for given output—productivity gains translate in to higher real wages with a delay caused by rigidities. The model simulations assume that government spending remains constant as a share of GDP over the long run. However, by boosting temporarily the growth rate of output per capita, the new reforms could lower the public debt-to-GDP ratio by about 0.7 percentage points in the long run. These estimates should be interpreted with caution as maximum gains from moving to the frontier in all reform areas simultaneously, which could be difficult practically and politically.

6. Reform efforts could focus on simplifying regulation for start-ups, retail distribution, pharmacies and the sale of medicine, and professional services (Box 2). We use the detailed 2018 PMR questionnaire to identify specific regulations in these areas that are particularly stringent in France. Regarding start-ups, creating a one-stop shop for issuing all authorizations and reducing the number of steps to start LLCs and personally-owned enterprises would go a long way in reducing the gap between France and peer countries. Removing restrictions in the maximum number of professionals (notaries), ownership and voting right restrictions, exclusive rights on administrative procedures (accountants, lawyers, notaries, and architects), and territorial restrictions (lawyers) can significantly improve the regulation score for professional services. A meaningful improvement in France's PMR indices can also be attained by easing authorization and registration requirements for retail outlets; allowing to sell non-prescription medicine in retail stores and loosening restrictions on their advertisement; loosening ownership restrictions for pharmacies; and easing territorial restrictions for pharmacies.

Figure 3: Impact of Aligning Regulation with Best Performers
(Induced changes in percent of initial output, or in percent for real wages)



Source: IMF Staff calculation.

7. In sum, further liberalizing product and service markets in France would complement recent and ongoing reform efforts by further boosting competition, productivity, and long-term growth. The simulation results in this paper should be interpreted with care, given modeling uncertainties and the assumption that policymakers would tackle all reform areas simultaneously, which could be challenging. In practice, policymakers would need to make some reform choices, while at the same time ensuring that a sufficient critical mass of reform is achieved to generate meaningful gains. This paper points to some areas that could achieve such gains, including tackling excessive regulation in retail distribution, sale of medicines, and some professional services, and further easing regulation for start-ups.

Box 1. The OECD's 2018 Product Market Regulation Indicators

The OECD's product market regulation (PMR) indicators measure the restrictiveness of regulation in various countries. The PMR indicators were introduced in 1998 and are updated every five years. They are based on a comprehensive set of questions on various aspects of a country's regulatory framework, which are translated into several sub-indicator scores, by type of regulation or sector of incidence, and aggregated into an economy-wide indicator (see Koske et al., 2015). In terms of type of regulation, the OECD's 2018 economy-wide PMR indicator comprises several categories that are grouped into state involvement and barriers to domestic and foreign firm entry.

State involvement:

- *Public ownership*—captures the pervasiveness of state ownership in network industries and in the overall economy, state control of privately-owned firms (as e.g. in the form of special voting rights), and aspects of governance of SOEs (e.g. the degree of insulation of their management from market discipline and political interference).
- *Government involvement in business operations*—encompasses indicators on price controls (e.g. regulated fees or prices that a professional charges, price controls on staple goods, gasoline, non-prescription medicines, and other goods, and restrictions on promotional sale prices), on command and control regulation (e.g. ownership restrictions and voting rights in professional service firms, ownership and territorial restrictions for pharmacies, and opening hours), and on public procurement (e.g. barriers for participating in public tenders and distortions in competition for public contracts).
- *Simplification and evaluation of regulations*—includes indicators on the complexity of regulatory procedures, on whether the impact of new regulations on competition is assessed and minimized, and on rules governing the engagement of stakeholders and the transparency of lobbying activities.

Barriers to domestic and foreign firm entry:

- *Administrative burden on start-ups*—captures the number of mandatory procedures and permits required to register a business, the associated costs, and requirements for minimum paid-up capital.
- *Barriers to entry in services and network sectors*—captures several types of legal and other entry barriers in retail trade, the sale of medicines, professional services, network sectors, and for-hire passenger transport services (e.g. limits in the number of professional allowed to practice, in the number of pharmacies in a given area, the number of competing firms allowed to operate a business, third-party access to networks, and the possibility of selling online).
- *Barriers to trade and investment*—captures the restrictiveness of FDI rules (e.g. foreign equity limitations), discrimination of foreign firms (e.g. regarding taxes and subsidies or in public procurement), and the extent of trade facilitation (e.g. recognition of foreign regulations and the use of international standards).

Sectoral indicators—The OECD also publishes sectoral indicators that quantify the stringency of all the different regulation categories mentioned above for selected sectors: retail distribution, retail sales of medicines, professional services (lawyers, notaries, accountants, architects, civil engineers, and real estate agents), and network sectors (energy, transport, and e-communications).

Box 2. Key Regulatory Restrictions for Start-ups, Sale of Medicines, Retail Distribution, and Professional Services

The answers in the OECD 2018 PMR questionnaire allow to identify specific regulations related to start-ups, retail distribution, the sale of medicine, and selected professional services (lawyers, accountants, notaries, and architects) that are particularly stringent in France:

Administrative Burden on Start-Ups (distance to frontier = 1.5; impact of each regulation in parentheses)

- Lack of one-stop shop for issuing all authorizations, permits and licenses that are required to open up a business (0.5).
- Lack of program to review and reduce the number of licenses and permits required by subnational governments (0.5).
- Excessive number of public and private bodies typically need to be contacted to start a Limited Liability Company (0.1) and a Personally-Owned Enterprise (0.075).
- Excessive number of mandatory procedures required to register a Limited Liability Company or allow it to be done via one-stop shop (0.1).

Sales of medicines (distance to frontier = 4.2; impact of each regulation in parentheses)

- Restrictions on the number of pharmacies that can be located in a given geographic area. (0.8)
- Restrictions on where a pharmacy can be located. (0.8)
- Restrictions for non-pharmacists to own a pharmacy (0.8)
- Restrictions to sell non-prescription medicines in non-pharmacies. (0.8)
- Restrictions on advertising of prices of non-prescription medicines. (0.8)

Retail distribution (distance to frontier = 1.9; impact of each regulation in parentheses)

- Requiring registration to establish a new retail outlet (in a specific register, beyond registration in a commercial or trade registry) for selling clothing and food and beverages. (0.4)
- Requiring authorization for establishing a new retail outlet for selling clothing and food and beverages. (0.3)
- Requiring a specific authorization to sell prescription and non-prescription medicines. (0.4)
- Restrictions on advertising of prices of non-prescription medicines. (0.4)

Professional services

Accountants (distance to frontier = 2.7; impact of each regulation in parentheses)

- Restrictions for non-accountants to have up to 100 percent of the voting rights in an accounting firm. (0.4)
- Exclusive rights for accountants on activities, such as drawing up financial statements, insolvency practice, tax advice, and on non-statutory audit. (0.3)
- Requiring membership in a professional organization in order to practice the profession. (0.3)
- Lack of Mutual Recognition Agreements (MRAs) of professionals with other countries. (0.3)
- Lack of clear process for recognizing education titles earned abroad. (0.2)

Box 2. Key Regulatory Restrictions for Start-ups, Sale of Medicines, Retail Distribution, and Professional Services (concluded)

Lawyers (distance to frontier = 2.6; impact of each regulation in parentheses)

- Restrictions for non-lawyers to own up to 100 percent of the capital of a law firm. (0.4)
- Restrictions for non-lawyers to have up to 100 percent of the voting rights in a law firm. (0.4)
- Territorial restrictions on the ability of professionals to practice (0.3)
- Exclusive rights for lawyers on activities, such as representation before administrative agencies, drawing up legal documents, and on advice on matters predominantly regulated by domestic, foreign, or international law (0.3)
- Requiring membership in a professional organization in order to practice the profession. (0.3)
- Requiring a professional examination in order to legally practice the profession. If existing, it should be administered by an independent regulator. (0.2)
- Lack of a clear process for recognizing education titles earned abroad. (0.3)

Architects (distance to frontier = 2.2; impact of each regulation in parentheses)

- Restrictions for non-architects to own up to 100 percent of the capital of an architectural firm. (0.3)
- Restrictions for non-architects to have up to 100 percent of the voting rights in an architectural firm. (0.3)
- Exclusive rights for architects on activities, such as design and planning, and on representation for obtaining permits. (0.2)
- Requiring membership in a professional organization in order to practice the profession. (0.3)
- Requiring a professional examination in order to legally practice the profession. If existing, it should be administered by an independent regulator. (0.2)
- Lack of a clear process for recognizing education titles earned abroad. (0.3)

Notaries (distance to frontier = 1.1; impact of each regulation in parentheses)

- Restrictions for non-notaries to own up to 100 percent of the capital of a notary firm. (0.4)
- Restrictions for non-notaries to have up to 100 percent of the voting rights in a notary firm. (0.4)
- Exclusive rights for notaries on activities, such as administering oaths and certificating legal documents, and transferring of real estate titles (0.4)
- Restrictions on the number of professionals allowed to practice set by law or self-regulation by professional bodies (0.4)
- Territorial restrictions on the ability of professionals to practice (0.4)
- Minimum prices or fees regulated by the government or self-regulated (0.3)

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