

The Interconnection Between Fiscal Consolidation Policies and Economic Performance

A comparative analysis across OECD countries



--The following has been redacted from a pending 2021 academic journal submission--

Though the regression results above do not display a relationship between debt levels and the impact of fiscal consolidations on economic performance, a slightly deeper analysis considers whether the cost of existing and new debt has an impact. Regardless of whether a country is increasing the amount of its total public debt, if current costs have a noted effect, policymakers may make appropriate choices. In consideration of the impact of the cost of newly acquired public debt, the following regression results represent tests that were subsequently created to consider the impact of interest rate levels on economic performance and whether those costs contribute to fiscal consolidation policies. The implied debt cost variable in the following were calculated as noted in the prior Research & Design section and is also interacted with the fiscal consolidation variables.

Chart 15: FC and Debt Cost Interaction with GDP

Ind.	Combined CAPB	OECD CAPB	IMF CAPB	IMF Narrative	Alesina Narrative
<i>Cost of Debt</i>	.002	-.0000	.100**	.0002	.0002
<i>FC</i>	.021**	.149**	.116**	-.070	-.006**
<i>Cost*FC</i>	-.005*	-.032**	-.014	.008	.0003

*=Significant at 10% level, **=Significant at 5% level, ***=Significant at 1%

While there is no clear relationship between the current level of the debt and GDP when a fiscal consolidation plan is implemented, the cost of a country's debt seems to have an effect. The majority of the coefficients on the interaction term fail to reach significance, but there does seem to be a negative pattern with the prior year's cost of

debt over the period through 2009 (using the OECD CAPB identification model), which has a strong and negative effect on GDP under a fiscal consolidation. The Combined CAPB variable (through 2019) substantiates this effect with a similar negative and significant coefficient on the interaction term.

Section 5 – Regressions related to monetary policy

Given the difficulty of assessing distinct effects related to monetary policy, confounded by endogeneity concerns related to most typical monetary policy decisions, the following specifications and analysis will rely on two unique variables.

In this first set of regressions, a variable that represents central bank independence (CBI) has been obtained from Garriga (2016) and interacted in the following regressions and accompanying relevant results. As described, this CBI variable is one of the most up-to-date and comprehensive measures of independence, providing the broadest basis for assessment while also allowing for a measure that approximates variability in central bank policies without including endogenous central banking policy measures. The results in Chart 16 demonstrate a potentially negative relationship between CBI and real GDP growth according to the most updated CAPB model, a significant and interesting result as it counters some prior literature. However, also of interest, are the coefficients on the interaction variable. Despite its negative relationship with GDP in the IMF's CAPB model, positive shifts in the CBI (more central bank independence) under fiscal consolidation policies may, under certain conditions, have a positive relationship with GDP. Both the IMF CAPB and IMF Narrative models results in this positive coefficient on the CBI interaction variable, though the Narrative version is not significant.

Contrarily, the Alesina Narrative model produces a negative, and strongly significant, coefficient on the interaction meaning that increased independence may have actually contributed to a reduction in GDP during fiscal consolidations. The rest of the coefficients range in magnitude and sign, though are also highly insignificant.

Chart 16: FC and CBI Interaction with GDP

Ind.	Combined CAPB	OECD CAPB	IMF CAPB	IMF Narrative	Alesina Narrative
<i>CBI</i>	-.0002	.004	-1.796**	.004	.001
<i>FC</i>	-.006	.051	-.143	-.205	.0004
<i>CBI*FC</i>	.009	-.077	.359***	.476	-.010**

*=Significant at 10% level, **=Significant at 5% level, ***=Significant at 1%

In order to consider which GDP components may contribute to the coefficient responses in the significant variables, further tests were conducted. Under both models, negative coefficients were found on the interaction variable under household consumption and private investment, especially strong in magnitude and significant in consumption under the IMF Narrative (data through 2009) (see Chart 17).

Chart 17: Narrative FC and CBI interaction under GDP Components

Ind.	IMF HC	IMF Invest	Alesina HC	Alesina Invest
<i>CBI</i>	-.014	-.007	-.020	-.020
<i>FC</i>	.431	-.160	.002	.002
<i>CBI*FC</i>	-1.731*	-.865	-.008	-.011

*=Significant at 10% level, **=Significant at 5% level, ***=Significant at 1%

Despite the previously discussed concerns related to the endogeneity of other monetary policy measures, the connection between central bank decisions, interest rates, and the cost of debt requires at least a minimal investigation into how short-term interest rates interact with economic performance during fiscal consolidations. The regression results can be found in Chart 18.

Chart 18: FC and S-T Interest Rates Interaction with GDP

Ind.	Combined CAPB	OECD CAPB	IMF CAPB	IMF Narrative	Alesina Narrative
<i>S-T r</i>	-.509	-.0003	-.142**	-.0004	-.0000
<i>FC</i>	-.001	.026	.028	-.075	-.007***
<i>S-T r*FC</i>	-.0000	-.002	.011	.007	.0003***

*=Significant at 10% level, **=Significant at 5% level, ***=Significant at 1%

There is a clear, direct relationship between central bank directed interest rates, such as the Federal Reserve's Fed Funds target rate, and short-term interest rates, providing an opportunity to consider whether these adjustments also have a relationship

with the impact on fiscal consolidation policies. Prior studies have suggested that increases in these rates have a negative impact on economic output; the prior findings above further demonstrate how the cost of debt may influence GDP under a fiscal consolidation. The above regressions do not fully support such an effect or relationship. In fact, most of the coefficients on the interaction term are small and highly insignificant, except that of on the interaction with the Alesina Narrative fiscal consolidation variable. Under this model, the interaction is also small, yet highly significant and positive, meaning that an increase in short-term rates under a fiscal consolidation seems to coincide with a slight positive increase in real GDP.

Finally, the rate of inflation, though well-correlated with short-term interest rates following the typical monetary policy transmission (-.88 in this dataset), is tested for its effect on fiscal consolidations. The following Chart 19 provides results across the several identification models, using the available CPI data.

Chart 19: FC and Inflation Interaction with GDP

Ind.	Combined CAPB	OECD CAPB	IMF CAPB	IMF Narrative	Alesina Narrative
<i>CPI</i>	-.0004	-7.37e-06	-.079***	-6.17e-06	-.0000
<i>FC</i>	-.057	-.004	-.207	.024	.001
<i>CPI*FC</i>	.0007	.0002	.003	.0001	-.0000***

*=Significant at 10% level, **=Significant at 5% level, ***=Significant at 1%

The given results are interesting in two regards. First, the coefficients on the CPI variable do follow the theoretical path that there is an inverse relationship between CPI

and GDP. However, in the interaction term, nearly all of the coefficients are positive (though small). The coefficient on the Alesina Narrative interaction is slightly negative and highly significant, being the only model that follows the expected theoretical conclusion. Per these results, as inflation increases, a fiscal consolidation may have a more negative relationship with GDP, however, the impact is exceedingly small, at best.

Section 6 – Exchange rate regressions

A country’s net exports and its real effective exchange rate (REER), should be interconnected, as positive adjustments in the REER equate to more expensive goods to foreign importers, which theoretically leads to a decrease in net exports. The correlation between the REER and the change in net exports in this dataset, however, is -.02. Some criticisms of fiscal consolidation research suggest that results are positively biased due to a failure to consider the impact on the economy from net exports and the REER.

The regressions results in Chart 20 offer the coefficients to the statistical tests that question whether there is a relationship between net exports and the impact of fiscal consolidations on economic performance.

Chart 20: FC and Net Exports Interaction with GDP

Ind.	Combined CAPB	OECD CAPB	IMF CAPB	IMF Narrative	Alesina Narrative
<i>NE</i>	.001**	-.000	-.004	-.000	-.000*
<i>FC</i>	.002	.031	.082**	.024	-.002***
<i>NE*FC</i>	-.002**	-.006	.003**	.000	.001***

*=Significant at 10% level, **=Significant at 5% level, ***=Significant at 1%

Combining all of the identification methods, ranging across the time period from 1978 to 2019, there is slight evidence for a small, positive trend related to the impact of net exports on fiscal consolidations. Considering the statistically significant results, there are interesting findings. While the Combined CAPB demonstrates a small, significant negative effect related to an increase in net exports, both the IMF CAPB (skewed towards more recent data) and the Alesina Narrative present a small, yet highly significant, positive relationship based on the conditional variable of a change in net exports. This confirms prior findings suggesting that such a result may (at least partially) help explain any expansionary effects found from fiscal consolidations alone.

Exchange rates have a clear, negative relationship with net exports, *ceteris paribus*. However, provided the results in the net exports coefficients above, a regression analysis with an interaction on the REER is useful. Results are provided in Chart 21.

Chart 21: FC and REER Interaction with GDP

Ind.	Combined CAPB	OECD CAPB	IMF CAPB	IMF Narrative	Alesina Narrative
<i>REER</i>	-.0002	-.0001	-.025**	-.0001	-.0001
<i>FC</i>	-.040	-.255	-.074	.797	.019
<i>REER*FC</i>	.0004	.002	.001	-.008	-.0002***

*=Significant at 10% level, **=Significant at 5% level, ***=Significant at 1%

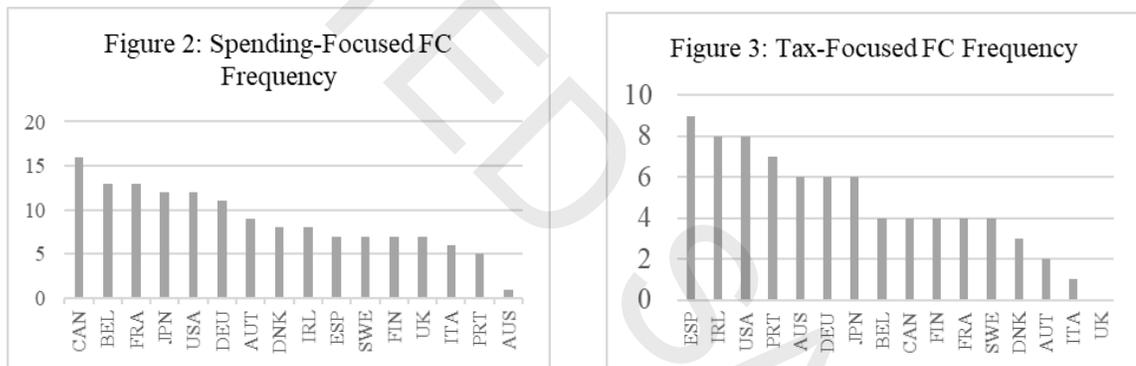
As anticipated, an increase in the REER is expected to align with a negative response in GDP. All of the coefficients on this test are negative, with significance only in the IMF's CAPB model. The positive signs corresponding with some of the interaction coefficients was not anticipated, though they are very small and highly insignificant. However, the one, highly significant result pertained to the most updated Narrative model, demonstrating that an increase in the REER may have a negative impact on the GDP, under a period of fiscal consolidation.

Section 7 – Individual country time-series regressions

Prior research has noted how existing macroeconomic models fail to take into consideration idiosyncratic fiscal policies across individual countries, or regions. Yang, et al. (2015) for example, points out that the frequency of fiscal policy adjustments can have an effect on fiscal policy efficacy. Closer scrutiny of the effects of fiscal consolidations at the individual country level, therefore, will provide needed insight into potentially disparate effects across countries, allow for an analysis of outliers, may point out noted trends, can disclose regional effects that are distinct from the broader effects captured in the entire set, and may highlight time-variant individual characteristics that may not be picked up in the predominant and popular fixed effects models. It is important to note that the results of the following regressions lack statistical significance due to observation limits at the individual country level, but are useful to investigating potential patterns or as a means to detect areas which can require a more detailed and robust inspection.

to the frequency of those policies. Both Denmark (lowest number of episodes within the dataset) and Canada (highest frequency) have estimation results that depict a negative relationship with GDP, as do the U.S. and Germany (next highest), as well as Australia and France (next two lowest).

Further dividing these fiscal policies by composition allows for a deeper inspection into whether there may be a relationship between the frequency of a particular type of fiscal consolidation and the impact that it has on GDP. Figures 2 and 3 denote the frequency of spending-focused and tax-focused fiscal consolidations by the country in which they occur, respectively.



Note: The combined total of the two categories may not match the total number represented in Figure 1 due to the imprecise calculations that combined IMF and Alesina Narrative identification methods.

Considering the frequency of spending-focused episodes, there is also little evidence of a relationship between the number of plans implemented and the effectiveness of those types of plans. Canada, Belgium, and France had the highest number of spending-focused fiscal policies, yet only Canada had positive signals in relation to GDP, while the U.K. had relatively few with coefficients similar to those of Canada. Australia, however, had the fewest (1), and also had the most negative response,

by a large magnitude. The frequency of taxation-focused plans further provided no consistent evidence that there is a relationship between the frequency and results, as no noticeable pattern can be found.

Section 8 – Potential instrumental variables

The advent of unique and updated identification techniques and increasingly sophisticated econometric models has yet to fully resolve concerns related to the endogeneity of fiscal consolidation variables of interest and the dependent variables of GDP and its various components. As discussed in the literature review, even a thoroughly investigated analysis based on multitude primary research and evidence can misidentify a fiscal consolidation that has been implemented for reasons other than those necessary for exogeneity, leading to correlation with the unobservables and omitted variable bias.

To provide an alternative model to test, an instrumental variable can be useful. A potentially satisfactory instrumental variable, therefore, has to first overcome several obstacles: a good instrument must have correlation with the fiscal consolidation variable, should not be a variable important enough to include in the main regression model, and should not be correlated with the error term, assumptions known as exclusion restrictions (Wooldridge, 2012). Though prior results have yet to identify a viable and reliable IV, the previous literature discussion noted findings of a correlation between specific political variables and the implementation of fiscal consolidations. For example, Hubscher and Sattler (2017) found a significant relationship between election timing and

additional indebtedness is less attractive, while fiscal consolidations will simultaneously be more costly to economic output.

Taken alone, these results are likely insufficient to provide policymakers with parameters for future fiscal consolidation proposals. While they do support the possibility that a higher cost of debt reduces the effectiveness of a fiscal consolidation, more conclusive and robust analyses may be required for policy consideration.

Section 5 – Monetary policy

The implications for monetary policy (including exchange rate policies, if taken as a strictly central banking policy) are known to have wide-ranging economic effects, whether manipulated during expanding, contracting, or stagnating economic conditions. The relation with fiscal policy is less clear. For policymakers, the effects of existing or anticipated monetary policies should be understood in the context of its influence on fiscal consolidations. The econometric limitations related to the endogeneity of policy variables is not just a common concern in fiscal policy; as monetary policies are often enacted in response to current conditions, or in anticipation of expected conditions, it is equally difficult to control for the endogeneity of related policy variables. This paper, therefore, studied the effects of an exogenous variable as well as those monetary variables typical of other studies.

One variable that is unlikely to vary in the short-run, that is also related to monetary policies, concerns the independence of the central bank. If the degree to which a central bank is perceived or measured to be independent from the governing authorities of a country has an impact on the ability of a fiscal consolidation to impact economic

performance, it should influence policy decisions. If the European Central Bank's high level of independence,¹³ for example, contributes positively to the effectiveness of tax-focused fiscal consolidations, European policymakers are better suited to place more value in the analysis of the policies of their peers, understanding that mimicking a policy from Australia (one of lowest levels of independence across the OECD) is less likely to generalize and result in the same effect. Furthermore, it is more likely that a country with a highly independent central bank will not experience the coordination of fiscal and monetary policy that past researchers have concluded to have caused an undue and mostly positive bias within fiscal consolidation results. The omitted variable that is often related to monetary policies is less likely to have a strong relationship with a fiscal consolidation if it is independent.

Using the CBI variable, a test on the hypothesis that central bank independence has no effect can be rejected, at least within models containing the most updated data. Strong statistical significance was found in the positive relationship of the IMF CAPB (which has data through 2019), as it impacts a fiscal consolidation, with slightly negative but still significant effects found within the Alesina Narrative model. In the short-run, a more independent central bank has a strongly positive relationship with how effective fiscal consolidations are, if they are identified under the CAPB method with data through 2019. This is interesting in that it is directly countered by the result based on Narrative identification; however, the Narrative version has a smaller magnitude and slightly less significance (5% level versus the CAPB's 1% level). Given the inconsistencies noted in the literature, along with the positive bias and concerns regarding misidentification, it can

¹³ All of the countries under the ECB have the same value in the index used to measure central bank independence, which is also the highest in the OECD.

be argued that the Narrative model presents more compelling evidence that a policymaker should be less inclined to enact a deficit reduction policy, if the country has a highly independent central banking authority. The results are especially pronounced while considering the effects of central bank independence on fiscal consolidation performance within the components of GDP. Neither household consumption nor investment had significant results under the CAPB model, while both were highly significant and negative within the Narrative model.

Other previously enacted monetary policies have been studied as potentially disruptive to fiscal consolidation policy solutions. Though policymakers do not have monetary policy tools available to enact in coordination with their proposals, policies currently in effect may help to support or stifle the expected or hoped for result from their policies. Considering short-term interest rates (relation to the cost of debt is theoretically relevant, at a minimum) as well as inflation (as it impacts consumption, investment, and real effects on debt and other variables) provided little additional insight of value to policymakers.

An increase in the short-term interest rate can inhibit investment and consumption, while further increasing the cost of debt. This dissertation's investigation supports those results (the short-term rate variable had negative and significant coefficients), but finds little effect as it relates to a fiscal consolidation across most of the identification models and time periods. This result is interesting in and of itself as it does not support prior findings of significantly negative effects. However, even more noteworthy are the results under the Alesina Narrative model, which demonstrates that short-term rate increases have a generally positive impact on the effect of a fiscal

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