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Fiscal Stimulus Impact on Firms' Profitability
During the Global Financial Crisis

by Carolina Correa-Caro, Leandro Medina,
Marcos Poplawski-Ribeiro, and Bennett Sutton

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I N T E R N A T I O N A L M O N E T A R Y F U N D

IMF Working Paper

Western Hemisphere Department

Fiscal Stimulus Impact on Firms' Profitability During the Global Financial Crisis¹

Prepared by Carolina Correa-Caro, Leandro Medina,

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Abstract

Using financial statement data from the Thomson Reuter's Worldscope database for 22,333 non-financial firms in 52 advanced and emerging economies, this paper examines how fiscal stimulus (i.e., changes in structural deficit) interacted with sectoral business cycle sensitivity affected corporate profitability during the recovery period of the global financial crisis (GFC). Using cross-sectional analyses, our findings indicate that corporate profitability improved significantly after the GFC fiscal stimulus, especially in manufacturing, utilities and retail sectors. Firm size and leverage are also found to be significant in explaining changes in corporate profitability.

JEL Classification Numbers: C33, E32, E62, H62

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I. INTRODUCTION

The stimulative fiscal response to the 2007–09 global financial crisis (GFC) was unique in the post-depression era in that so many countries simultaneously engaged in expansionary policies. This period has many characteristics of a natural policy experiment given the number of countries responding to the crisis at the same time and in the same direction. While several studies have analyzed the macroeconomic impact of those stimuli, ten years after their debut the literature is still scarce on their influence at the firm and industry level. The understanding of the corporate channels as well as their effectiveness should be documented and explored to better tailor future policy responses.

To the best of our knowledge, few papers have empirically investigated firm-level responses to fiscal policy. Claessens, Tong and Wei (2012) developed innovative specifications to analyze firm behavior during the contraction stage of the GFC, some with controls for fiscal and monetary policy responses during 2008-09, the peak of the crisis. They find that profits respond positively to the degree that fiscal expansion occurred at that early stage. On the other hand, Alesina et al. (2002) using macro level data, find that an increase in government spending reduce profits, suggesting a positive role for fiscal consolidations. For them, increases in government spending and taxation can depress profits and investment if they put upward pressure on private sector wages, generating a “labor-market channel” for the transmission of government spending into those economic variables.

Looking to build on the limited literature, this paper exploits the experience of 52 economies—44 countries that simultaneously responded to the crisis with counter cyclical fiscal policy and 8 that were neutral to contractionary—to document its impact on corporate profitability. From a macroeconomic perspective, such analysis is important given the tension between stimulative effects and financial crowding out of fiscal policy on credit-constrained firms (Baum and Koester, 2011; and Koo, 2011) and the well-established causal relationship between profits and capital investment (Blanchard, Rhee, and Summers, 1993; and Alesina et al., 2002). The use of firm level data is also helpful in addressing the usual identification issues of causal relationships between fiscal stimulus and macroeconomic outcomes in a cross-country setting (Aghion, Hémous and Kharroubi, 2014).

There are competing theories on the effect of a fiscal stimulus on firm profitability. Neo-Keynesian thinking holds that under sticky prices and wages, firms will increase production and consequently profitability to satisfy demand resulting from higher discretionary spending by a government on goods and services as well as capital projects. Alternatively, fiscal stimulus can also be achieved by reducing tax revenue, increasing after-tax income for consumers and businesses who in turn spend more on consumption and investment that drive higher sales and higher profits.

An inverse view is observed by Alesina et al. (2002), who find that expansionary fiscal policy can depress profitability and investment while the magnitudes of such effects are sensitive to the composition of stimulus, spending versus taxation (see also Hassett and Hubbard, 2002). Thus, if a fiscal stimulus is conducted via an increase in government employment or wages, the reservation wage of all workers—including those in the private sector—may increase, reducing profits and investment. In turn, the effects of purchases of goods by the government are less clear-cut.

In real business-cycle (RBC) models, an increase in government purchases of goods leads to a fall in the wealth of the representative individual (for example, via taxation in a Ricardian equivalence or through crowding out private consumption), causing (other things equal) their labor supply to increase, real wage to fall and, thus, firms' output and profitability to increase.² On the other hand, for a reduction in taxes many of the models that include unions, a decrease in labor taxes or social security contributions increases the net wage of the worker; leading to a reduction in the pretax real wage faced by the employer and a rise in profits, when the burden of labor taxes are in part borne by the firm.

The absence of theoretical clarity and the ambiguity of different policy instruments on the effect of fiscal stimulus on firm profitability call for an empirical investigation. This paper attempts such empirical analysis by estimating the impact of *discretionary fiscal impulse* (i.e., a change in the structural deficit)—scaled by sectoral sensitivity to the business cycle—on corporate profitability at the firm level. The use of the structural deficit as testing variable allows us to estimate what is the strongest of the ambiguous effects described by the literature. To measure firm responses, we observe changes in financial statement data from 22,333 firms in 52 advanced and emerging economies reported in corporate fiscal years 2009 and 2010. The firm-level data is obtained from the Thomson Reuters Worldscope database that compiles financial statements of publicly traded firms (see also Ağca and Celasun, 2012; and Medina, 2012).³

The empirical approach employed here finds statistically significant evidence that firms' profitability improved with the fiscal stimulus provided during the GFC. For our full sample of economies an increase in the structural deficit of one percent of potential GDP is

² If the increase in government spending is temporary, the wealth effect may be small, output increases by little, and profitability may fall (see Baxter and King, 1993).

³ The analysis is also related to the debate on the literature about the impact of fiscal stimulus on output (fiscal multipliers), which has been a key factor when discussing the appropriate fiscal response to the financial crisis. Particularly under recessions and constrained monetary policy, the literature has recently found that short- and medium-term multiplier estimates are indeed significantly larger than those found in the previous literature (see Baum, Poplawski-Ribeiro, and Weber, 2012; Mineshima, Poplawski-Ribeiro and Weber, 2014; Dell'Erba, Koloskova, and Poplawski-Ribeiro, 2018).

associated, on average, with a rise in profitability of around 0.14 percentage points of the average firm's total assets after controlling for the average sectoral business cycle sensitivity. If we consider the average fiscal impulse between 2009 and 2010 of 1.8 percent of potential GDP for our full sample, the increase in profitability implied by such impulse is around 0.3 percentage points of the firm's total assets, equivalent to half of the median increase in cross country/cross industry profitability for the period.

The effects are larger on average among advanced economies (AEs), but not statistically significant among the group of emerging economies (EMs). Results further suggest that the effect on profitability is most acute in the manufacturing, utilities and retail sectors. They also show that the financial conditions of firm before the onset of the crisis—such as asset size, debt and leverage ratios—matter for profitability during the recovery.

Such findings survive several additional tests and robustness checks. Among them, we report two important robustness tests in the paper. First, we verify that our results hold when a measure of discretionary fiscal stimulus during the crisis identified by the International Labor Organization (ILO) through the narrative approach replaces our baseline fiscal impulse variable. Second, results also hold when we replace the baseline fiscal impulse by an IMF dataset of unanticipated government expenditure calculated using forecast errors.

Our analysis has two caveats to bear in mind, though. First, it refers only to publicly listed firms that tend to be larger and likely to find easier access to financing, representing, on average, 26 percent of private domestic investment and profitability comprising about 12 percent of GDP, but only about 8.5 percent of total employment across the sample of countries. Hence, we cannot claim that results are representative of the entire non-financial corporate sector of most countries. Second, its sample period (immediately following the GFC) is unique on the synchronicity of slowing growth and counter-cyclical fiscal and monetary policies across AEs and EMs. Absent these conditions researchers must devote more efforts to controlling for policy spillovers emanating from other countries.

The rest of this paper is organized as follows. Section II provides a literature review. Section III describes the econometric model and methodology of the paper. Section IV discusses the results, whereas Section V presents additional tests and robustness checks. Section VI at last concludes the paper.

II. LITERATURE REVIEW

In this paper, we employ an empirical model used by Claessens, Tong, and Wei (2012), who examined how the 2007–2009 crisis affected firm performance, using financial statement data for 7,722 non-financial firms in 42 countries. The authors investigate how various linkages propagated shocks across borders, isolating and comparing effects from changes in

business cycle, international trade, and external financing conditions, on firms' profits, sales and investment. They find that the crisis had a bigger negative impact on firms with greater sensitivity to business cycle and trade developments, particularly in countries more open to trade and with a limited difference of financial openness. They further performed an additional test, finding a significant effect of fiscal and monetary stimulus on firms' profits, but an insignificant effect of the fiscal stimulus for sales and investment during the period 2008–2009. Their model suits well this investigation for capturing the effectiveness of policies implemented in the aftermath of the 2008 crisis and exploring some of the channels by which fiscal impulse impacts corporate behavior.

Our paper further draws on Medina (2012), who studied corporate performance in the aftermath of the global crisis employing a sample of 6,581 manufacturing firms in 48 developed and developing countries in 2010. In a cross-sectional analysis, that author identifies factors of resilience as well as vulnerability, showing that pre-crisis leverage and short-term debt suppressed the speed of the recovery in real sales, while higher asset tangibility ratios were associated with a speedier recovery. The negative effect of leverage was also found to be highly non-linear. Furthermore, the effects are different in advanced and emerging economies. He also shows that the policy framework critically matters for firm growth. In particular, countries that allowed the exchange rate to depreciate witnessed a faster recovery in sectors highly dependent on trade.

Fernández-Villaverde et al. (2015), moreover, analyze the role of fiscal volatility on markups. They find that larger fiscal volatility increases markups owing to an aggregate demand channel and an upward pricing bias channel, both rooted in nominal rigidities. In turn, Arnold and others (2011) and Schweltnus and Arnold (2008) use annual data at both the firm level and the industry level to investigate the empirical link between corporate and income taxes and total factor productivity at industry level and investment. Their empirical evidence at industry level is based on a panel data set of 21 industries in manufacturing and business services across 13 OECD countries over the period 1981–2001, extracted from the OECD STAN database. The analysis at the firm level is based on a stratified sample of approximately 287,000 firms from 12 European OECD countries over the years 1996 to 2004, extracted from the Amadeus (Bureau van Dijk) database. Using those data, they conclude that the best tax cut for increasing demand and promoting long-run growth appears to be a reduction in personal income taxes and social security contributions on low-income households.

A related stream in the fiscal literature uses firm- or industry-level data to estimate the fiscal multiplier and debt accumulation effect on output and employment (e.g., Perotti, 2008; Aghion, Hémous and Kharroubi, 2014; Nekarda and Ramey, 2011). Aghion, Hémous and Kharroubi (2014) find that a more countercyclical fiscal policy enhances value added and

productivity growth more in more financially constrained industries such as those whose US counterparts are more dependent on external finance or display lower asset tangibility. But those authors do not analyze the effect of fiscal policy on firm-level profitability and employ other techniques—such as structural VARs, panel data models, and difference-in-difference estimations—which are different from our cross-country/cross-industry analysis during the GFC crisis. Using provincial data on public spending in South Africa, Kneller and Misch (2014) further show that increasing expenditures on education, health, and transport as a share of total expenditures has a significant effect on productivity of firms with the lowest capital-labor ratios. Finally, Woo and others (2014) uses detailed industry-level data for 25 manufacturing industries across 29 OECD countries over the period of 1980–2008 and find a strong negative link between the high public debt and lower growth.

Several post-crisis papers further examine the intra-governmental transfers component of the US fiscal stimulus. For example, Carlino and Inman (2013) examine the historical experience of federal government transfers to state and local governments and their impact on aggregate GDP growth. They reach three conclusions. First, aggregate federal transfers to state and local governments are less stimulative than are transfers to households and firms. Second, within intergovernmental transfers, matching (price) transfers for welfare spending are more effective for stimulating GDP growth than are unconstrained transfers for project spending. Third, the American Recovery and Reinvestment Act of 2009 (ARRA) would have been 30 percent more effective in stimulating GDP growth had the share spent on government purchases and project aid been fully allocated to private sector tax relief and to matching aid to states for lower-income support.

III. METHODOLOGY

A. Estimation Strategy

We specify the following equation to analyze the impact of fiscal stimulus at the firm-level *profitability* using a firm level cross-section with country/industry indicators and country dummies:⁴

$$\Delta Profitability_{i,j,k} = \frac{\alpha_k + \gamma BCS_j \times \Delta FP_k + \varphi EFD_j \times \Delta MP_k + \beta' Control_{i,j,k} + \varepsilon_{i,j,k}}{\quad}, \quad (1)$$

⁴ We estimate either robust standard errors or cluster them at country-level. Both methodologies provide similar results.

where the dependent variable $\Delta Profitability_{i,j,k}$ denotes the change in profits in percent of total assets from 2009 to 2010, for firm i in industry j , in country k of a particular region (*ALL* countries, AEs or EMs); and α_k represents country fixed-effects (via country dummies).⁵ $BCS_j \times \Delta FP_k$ interacts the business cycle sensitivity measure for sector j with the fiscal impulse ΔFP_k of country k .⁶

The interaction term $EFD_j \times \Delta MP_k$ captures the firm response to change in monetary policy defined as the change (first-difference) in nominal short-term policy rates scaled by a sectoral indicator of interest rate sensitivity. A loosening of monetary policy (a negative change in policy rates) should support higher profits by stimulating aggregate demand and reducing interest expense. The expected sign in specification (1) remains negative after interacting with external financing indicators, both of whose values rise with increasing dependency. We do not include monetary stimulus on its own as that is captured by the country dummies. Section B below contains a more detailed discussion of the construction of business cycle and interest rate sensitivities and as well as an explanation for the use of interaction terms.

$Control_{i,j,k}$ is a vector containing the firm characteristics reported in financial statements, including: (i) size of the firm ($Size_{i,j,k}$); (ii) indebtedness ($Leverage_{i,j,k}$); (iii) change in sales to asset ratio; (iv) cash to assets ratio ($Balance\ sheet\ liquidity_{i,j,k}$); and (iv) short term debt (the portion of debt payable within one year) to total debt.

We control for the *size of the firm*, on the belief that large firms are more likely to possess dominant (or near dominant) market shares within the sectors in which they operate. Market dominance can govern the scope price setting opportunities and negotiating positions with suppliers. Both advantages promote higher profits and so a positive correlation is expected with profitability. Since we are trying to measure the *direct* effect of the fiscal stimulus on profitability, the *change in sales to asset ratio* aims to capture demand effects that would naturally affect profitability. For example, without controlling for this variable, the sharp decline in aggregate demand during the GFC, could blur the *direct* effect of fiscal policy on profits via the wealth effects discussed in Alesina et al. (2002) and Hassett and Hubbard (2002). Yet, we have also estimated the effects of fiscal policy on profitability excluding that

⁵ Results remain robust to replacing the country fixed-effects by the country-level measure of fiscal impulse. The significant effect of the stimulus on firms' profitability also remain significant in our baseline specification if we further replace country- to industry-level fixed-effects. Those tests are not reported in the paper, but available upon request to the authors.

⁶ As Section V reports, we further test the robustness of our results by exploring the alternative measures of fiscal stimulus from the International Labor Organization (ILO). We also replace the fiscal impulse by IMF data on unanticipated (forecast errors) government expenditure (see, for example, Auerbach and Gorodnichenko, 2013; Lledó and Poplawski-Ribeiro, 2013; and Abiad, Furceri, and Topalova, 2016).

control and the results are qualitatively robust. Moreover, additional tests on the sensitivity of demand (changes in the sales to asset ratio) were not able to establish a statistically significant correlation between with fiscal policy, suggesting it can be included as a control for other elements driving changes in demand.

Firm indebtedness or leverage is controlled for given that more indebted firms present increased risk of default to lenders. The heightened risk of default usually makes it more difficult for firms to obtain financing for new investments that boost profitability through greater labor productivity or to grow sales through new ventures.

Balance sheet liquidity and short-term borrowing ratios are additionally included in (1) given that the use of liquid assets to support working capital or pledging it as collateral both contribute to lower interest expense and so should be positively correlated with changes in profitability.

B. Measures of Business Cycle Sensitivity and External Financial Dependency

This section describes the industry/sector specific business cycle sensitivity index; industry specific trade sensitivity index; and industry specific measure of dependence on external financing.

The Business Cycle Sensitivity (BCS) of the industry j measures estimated by Tong and Wei (2008) (also used by Claessens, Tong and Wei, 2012)⁷ is constructed as the log change in stock prices for US listed firms over the period September 10 to September 28, 2001, capturing the relative, market priced assessment of sectoral sensitivity to a clearly anticipated and imminent recession. The price changes are then averaged at the three-digit SIC sector level to capture investor perceptions of sectoral sensitivity to the business cycle. This approach assumes that sensitivity to business cycle is an intrinsic property of the sector, and therefore the index derived from the pre-crisis data is applicable to firms in the same industry across all countries.⁸

We employ two indicators of external dependency on financing to capture monetary policy sensitivity in any sector j (EFD_j). The first is (a) intrinsic dependence on external finance for investment (DEF_INV $_j$); and (b) intrinsic dependence on external finance for working capital

⁷ We thank again Hui Tong for sharing the BCS data and Stijn Claessens and co-authors for sharing the data on external financing with us.

⁸ As a caveat, this business cycle sensitivity index could be capturing a stronger sensitivity of a particular sector, such as IT, to the 2001 crisis rather than a sectoral sensitivity to the aggregate demand. Tong and Wei (2008) explain how the data construction attempts to avoid such issue.

(DEF_WKj). Dependence on external finance for investment captures the degree to which firms are unable to fully pay for capital investment out of cash flow from operations and so must borrow from external lenders. The indicator of intrinsic dependence on external finance for working capital captures the cash liquidity of a firm's operations constrained by the size of its accounts receivables and the flexibility accorded by its accounts payables. Their construction follows Raddatz (2006) and employs the notion of "cash conversion cycle".⁹

The choice to interact policy variables with sectoral sensitivity indicators is preferred over the use of sectoral dummies or fixed effects because they permit the sectors to be independently sensitive to one or both (or neither) measures. Fixed effects or dummies would force a linear combination of the two. We do include country fixed effects to control for country characteristics or policies not explicitly controlled for.

Furthermore, the interacting of country level policy variables with various sector level sensitivities help address three concerns of Aghion, Hémous and Kharroubi's (2014) in the causal relationship between macro level indicators of fiscal and monetary stimulus and macroeconomic outcomes in a cross-country setting. Their first issue is that the cyclical nature of fiscal policy is typically captured in the empirical literature by a unique time-invariant parameter, which only varies across countries. Consequently, standard cross-country panel regression cannot be used to assess the effect of the cyclical pattern of fiscal policy on macroeconomic variables (e.g., economic growth) in as much as the former is perfectly collinear to the fixed effect that is traditionally introduced to control for unobserved cross-country heterogeneity. Such issue is avoided in our cross-country/cross-industry analysis.

Secondly, with annual data it is nearly impossible to determine the direction of causality between fiscal policy measures and macro indicators. However, when observing the behavior of macro level policy and firm level financial statement variables, it is quite plausible to assume that policy variables affect corporate decisions, but the reverse is not true. This is particularly the case if no individual firm is large/systemic enough to affect the broader macroeconomy.

The final concern we address is that a cross-country panel regression, particularly one which is restricted to a small cross-country sample, is unlikely to be robust to the inclusion of additional control variables. Thus, even if cross-country panel regressions point to correlations between the cyclical pattern of fiscal policy and profitability (aggregated to the macro level), the channel through which this correlation works is unlikely to be well

⁹ Dependence on external finance for investment calculated as capital expenditures less cash flow from operations divided by capital expenditures. Dependence on external finance for working capital, also referred to as the cash conversion cycle, is constructed as 365 days times the sum of two ratios: first is inventories less accounts payable divided by cost of goods sold and the second is the ratio of accounts receivables to total sales.

identified. Nevertheless, with firm level observations, there are enough records to ensure that the results withstand the inclusion of country- and industry fixed-effects plus the set of structural variables in the empirical model. In turn, the main caveat of our investigation is that the cross-country/sector specific analysis affects the interpretation of the aggregate magnitude of the profitability gain/loss induced by the fiscal stimulus.

C. Corporate and Macroeconomic Data

The source for firm level financial statement data employed in this study is the Thomson Reuters Worldscope database containing income statement, balance sheet and cashflow items for publically traded firms. By nature of being publically listed, these firms tend to be among the largest operating in a country. The data allow for sectoral analysis of firm performance exploiting the Standard Industrial Classification (SIC) industry grouping.

The sample begins with 22,333 observations (trimmed to 18,319 in the specification with all controls are added) reported by non-financial firms in corporate calendar year 2010 across 26 advanced and 26 emerging economies. We exclude financial sector firms for whom the scale of leverage can be influenced by investor insurance schemes, which is generally not the case among non-financial firms. Also, it is a well-recognized aspect of the crisis that the true capital structure and scale of financial obligations of financial firms was obscured by complex subsidiary structures, derivative positions, and securitization.

Fiscal data on public spending and revenues come from the IMF World Economic Outlook (WEO) database. Discretionary fiscal impulse is measured as the change (first-difference) in the government structural balance (in percent of nominal potential GDP) between 2008 and 2009. Government structural balances are estimated by the IMF country team staff and are the difference between government revenues and expenditures from which automatic measures tied to the business cycle have been removed leaving only discretionary changes implemented by the government. As our main fiscal measure, we use ex-post estimates of structural deficits, published in the spring 2014 WEO. But, given issues such as GDP revisions, we also ran additional robustness checks using other measures of structural balances including the change in government structural spending, WEO fiscal forecast errors (see, for example, Abiad, Furceri, and Topalova, 2016), and narrative constructions of discretionary revenue and expenditure policy after the crisis compiled by the International Labor Organization (ILO). The expenditure specifications agreed with the structural balance results, while the ILO tests shared some promise but suffered from a less comprehensive country coverage.

Finally, consumer price inflation and monetary policy rates are gathered from the IMF's International Financial Statistics.

D. Descriptive Statistics

Although our data sample is restricted to publicly traded firms, there is nevertheless great heterogeneity across sample firms in the responses of their profitability before and after the crisis. Table 1 reports the principal descriptive statistics for the variables of interest.

The median profitability measured by a firm's earnings before interest, taxes, depreciation, and amortization of principle (EBITDA) in percent of total assets in 2010 was approximately 9 percent among the sample of firms in our preferred estimation, which is reported in Table 1. This (pre-tax) profitability was nearly 1 percentage point higher than during the crisis (8.1 percent in 2009) but not yet recovered to the 10.5 percent level observed in 2007. Firms in advanced economies had lower profitability ratios and suffered more than those in emerging markets. The median profitability rate for advanced economy firms in 2007 was close to 10 percent, declining to 7.4 percent during the crisis (2009) and rising to 8.6 percent in 2010. Profitability in emerging market firms was significantly higher during the same period (median of 11.4 percent in 2007, 9.2 percent in 2009 and 9.7 percent in 2010).

The interquartile range of firm profitability in 2007, 2009, and 2010 (Figure 1) suggests that among publicly traded firms, a broader cross section of advanced economy companies was less profitable or subject to a larger financial shock than their emerging market counterparts. Also, the distribution of profit ratios in advanced economies widened and encompassed more negative outturns following the crisis. This likely reflects the greater initial intensity of the crisis in advanced economies. Figure 2 implies the resilience of emerging markets reflects strength of their nominal profits in outpacing a growing asset base.

With respect to other indicators of financial health going into the crisis (2007), advanced and emerging market firms had similar median short term to total debt ratios, at 53.3 and 51.2 percent, respectively; median cash-to-assets ratios were higher for advanced, at 10.1 versus 8.2 percent.

Concerning the fiscal impulse, Figure 3 presents estimates of the change in structural fiscal deficit between 2008 and 2009. That impulse ranged from an expansionary change in the structural fiscal deficit of 10 percentage points of potential GDP in Russia to a contractionary change of -2.7 percent in Hungary. The median change in the deficit is roughly 1.6 percent of GDP, which is consistent with the median and mean for the change in structural balance presented in Tables 1, 2, and 3. Also reported are the variables used in robustness checks, the change in government expenditure and the ILO discretionary measures as well as the IMF

fiscal forecast errors in 2009 are also all positive for the economies in our sample (Tables 1, 2, and 3).¹⁰

IV. RESULTS

We first present our benchmark estimation in table 4 with all firms for all countries, followed by a segmentation of the sample to test for differences between advanced and emerging economies. We also look at asymmetric effects only for those cases in which the fiscal impulse was exclusively positive. The fiscal impulse effect on firms' profitability is also investigated in this section for several different industries. Finally, we present the same specification using alternate measures of fiscal impulse.

A. Baseline Estimation

Table 4 shows the effects of fiscal stimulus on changes in the profit ratio following the GFC. In the first estimation (Column 1), our estimation includes (i) the stimulus interacted with the business cycle sensitivity; and (ii) changes in monetary policy rates interacted with dependency on external for finance for working capital and investment dependence.

For our full country sample, we find that the fiscal stimulus significantly increased corporate profitability during crisis. Bearing in mind that here fiscal stimulus is measured as a change to the structural *deficit* (i.e., fiscal impulse), a statistically significant positive sign in the first line of Table 4 indicates that a change towards larger structural deficits leads to a positive increase in corporate profitability for a given level of business cycle sensitivity. This is true for all other specifications in which we introduce additional control variables one by one and all together in Column (7). The value of the coefficient oscillates between 2.9 and 1.2, with this latter corresponding to the coefficient in Column (7), our preferred specification. This relationship is more evident in AEs' firms, for which the coefficient is nearly twice as large than the statistically non-significant coefficient found in the EMs sample (columns 8 and 9).^{11,12}

¹⁰ Notice that for Ireland, the WEO figures for general government expenditure includes the financial support provided to the banking sector (consistent with Eurostat official data), whereas the structural balance does not include this type of expenditure.

¹¹ Detailed results of the baseline estimation for the country subsample of AEs and EMs are not shown here but available upon request to the authors.

¹² The latter result for EMs is in line with the literature of fiscal multipliers for this group of countries, obtaining mostly insignificant multipliers for them (e.g., Ilzetzki, Mendoza, and Vegh, 2013).

The coefficient of the interaction term between fiscal impulse and business cycle sensitivity in our preferred specification in Table 4 (Column 7) implies that the increase in profitability owing to the stimulus was around 0.3 percentage points of the average firm's total assets. That is when we consider the average fiscal impulse of 1.8 percent of potential GDP and a mean business cycle sensitivity of 0.12 for our full sample (Table 1). Figure 4 displays the economic impact of different fiscal impulses on the change (increase) in profitability ratio for a given business cycle sensitivity. We take the distribution values of both variables from the interaction term (fiscal impulse and BCS) reported in Table 1. The average increase in firm profitability of 0.26 percentage points of the firm's total assets obtained with the average fiscal impulse of the full sample is close to the half of the median increase in cross country/cross industry profitability for the period (0,65 percentage points of firm's total assets). Such effect is even larger for AEs, as the coefficient of Column (8) in Table 4 already indicates.

These results suggest that during the financial crisis, the fiscal stimulus either through a discretionary increase in spending or a reduction in revenue receipts supported higher profitability in the first year after fiscal policies were enacted. The channels through which this might occur include stimulating the economy activity to raise sales (firm revenue) or reducing firms' costs (taxes paid). The positive and significant coefficient on change in sales scaled by total assets suggests that where fiscal and monetary policy were able to stimulate domestic demand, they also increased profits. This corroborates with the findings at the macro level of large fiscal multipliers during recessions (Auerbach and Gorodnichenko, 2012; Baum, Poplawski-Ribeiro, and Weber, 2012; and Dell'Erba, Koloskova, and Poplawski-Ribeiro, 2018). Our analysis does not replicate, however, the non-significant findings of the stimulus on profits (markups) from Nekarda and Ramey (2011) or the significantly negative findings of the fiscal stimulus on profitability as in Alesina et al. (2002).

Regarding the effect of monetary policy in our baseline estimation, we find that a reduction in the policy rate interacted with sectoral dependence on external finance for working capital does not affect profitability significantly in different specifications. Hence, we exclude that variable from our preferred model in Column (7). On the other hand, monetary policy rate interacted with sensitivity to financing for capital investment is significant in all columns. Its low but significant negative value of around 0.06 percent suggests that a decrease in the monetary policy rate of 1 percentage point is associated with an increase in profitability of 0.05 percentage points, possibly by reducing the cost of new financing. The persistence of previously contracted debt service likely explains some of why the coefficient is so low.

Other controls reported in column (7) of table 4 indicate that initial indebtedness (the 2007 stock of debt) partially explains profitability changes in 2009; the log of total assets in U.S.

dollars in 2007—which is here a proxy for firm size—is also significant and positively correlated increases in corporate profitability; short-term debt ratios and firm liquidity (cash and short term investments in percent of total assets) are also associated with higher (though not always statistically significant) profitability after fiscal and monetary intervention.

B. Testing Asymmetric Effects of the Fiscal Stimulus

Our baseline estimation used all observations of fiscal impulse, including instances of fiscal consolidation (i.e., negative fiscal impulse). As shown in Tables 1 to 3 and in Figure 3, although most governments implemented fiscal stimulus during the crisis, policy in some economies resulted in consolidation. As a robustness check, we now restrict our sample to only those economies that had a positive fiscal impulse during our period sample (excluding Egypt, Germany, India, Ireland, Switzerland, Turkey, the Ukraine and Hungary).

Table 5 performs this analysis by reporting the same baseline estimation found in Column (7) of Table 4 alongside the same specification, but for a restricted sample (positive impulse only) countries first ALL countries, then AEs and EMs. This experiment finds a slightly weaker, but still positive and significant, coefficient on the interaction term for the total sample. That the correlation between profitability and stimulus is stronger in the presence of both positive and negative stimulus supports the notion that while fiscal stimulus increases profitability, the counter-factual also appears true—that consolidation depresses corporate profits. Looking at the split between AEs’ and EMs’ firms, Table 5 confirms the non-significant symmetric effects of fiscal impulse for EMs.

The results for the other variables are similar to those obtained before. An increase in the policy rate interacted with the investment capital dependency continues to negatively affect firm-level profitability when interacted with working capital dependency for the full sample and for EMs. The size of the firm in terms of the *log of total assets in US dollars in 2007* also continues to be significant, positive and with a relatively similar value for the full sample of economies and EMs. The same applies for our firm-level measure of *leverage*, confirming the robustness of the finding that firms with higher leverage prior to the crisis experienced a lower profitability during the crisis for the full sample and EMs that implemented a de facto fiscal stimulus.

C. Industry/Sectoral Analysis

Having established that there is a statistically significant response of profitability to fiscal stimulus, the next step is to investigate if certain sectors are more sensitive to the fiscal impulse. Such information could be used by policy makers to better target fiscal resources towards more responsive sectors. To that end, estimates are calculated for the same model (1) for different sectors.

Tables 6a and 6b display these results. Given that rough 55 percent of the firms in the sample were in manufacturing, there is little surprise that the coefficient on the fiscal impulse measure was found to be statistically significant in that sector. A fiscal impulse of 1 percentage point of potential GDP directed to that sector after the crisis is on average associated with an increase in profitability of 0.21 percentage points of the firm total assets for the average business cycle sensitivity (see Table 6a). More surprising was that only two other sectors also registered significant sensitivity of profitability to the stimulus: retail and utilities.

D. Expenditure vs Revenue Composition of Stimulus

Alesina et al. (2002) investigate how government spending affects profitability at the macro level. They breakdown government spending in three categories—the wage bill, purchases of goods, and transfers—and find that all the spending variables have a negative effect on profits at the macro level. At the same time, Dell’Erba et al. (2018) find that expenditure-based multipliers are larger than the tax-based ones during protracted recessions like the period of the global financial crisis.

So, in this section we perform an additional decomposition to understand further counter-cyclical policy. We replace our measure of fiscal impulse (FP_k) in Model 1 by the change in total government spending in percentage of GDP, as measured by the World Economic Outlook database.¹³

As Alesina et al. (2002) discuss, theoretically, the expected effect of fiscal stimulus via government spending depends on the dynamics modeled—Real Business Cycle, New-Keynesian or New Classical Models; on the structure of domestic taxation; on whether the labor market is highly unionized or not; and on the elasticity of individual labor supply.

Tables 1 to 3 report that the increase in government expenditure in response to a downturn is, on average, larger than the increase in the total fiscal impulse. This already indicates a high correlation between the two fiscal measures, suggesting a positive coefficient for the government expenditure measure.

Table 7 presents results substituting the total fiscal impulse by the change in government spending for the full country sample (ALL). Moreover, we also perform the same estimations for a country subset in which the change in government expenditure was strictly positive in

¹³ The implicit assumption and caveat in this section is that all government spending is discretionary, even though some of that expenditure, particularly in advanced economies, depends on the business cycle (see, for example, Darby and Melitz, 2008; and Poplawski-Ribeiro, 2009).

response to the GFC. The interaction-term coefficient in the unrestricted sample remains significant, positive, but slightly smaller (0.97) than in the total impulse estimation (1.19) as would be expected given the larger magnitude of the change in government spending. This further suggests that counter cyclical fiscal policy and models that privilege the role of government purchases on activity, on a fall in real wage, or on avoiding hysteresis (Blanchard et al., 2015; and Summers, 2015) seem to have been more relevant to increase firms' profitability during the GFC.

V. ROBUSTNESS TESTS

This section performs two robustness checks. First, we check whether our main results on the fiscal stimulus hold when we use a measure of discretionary fiscal stimulus during the crisis identified by the ILO to replace our baseline measure of fiscal impulse. Second, we further replace that baseline measure by IMF data on unanticipated (forecast errors) government expenditure, which provides another exogenous method to identify fiscal stimulus (Auerbach and Gorodnichenko, 2013).

A. ILO's Alternative Measure of Discretionary Fiscal Stimulus

In this first test, we check whether our main results on the fiscal stimulus hold when we replace our baseline measure of fiscal impulse by a measure of discretionary fiscal stimulus during the crisis identified by the International Labor Organization (ILO) through the narrative approach (Guajardo, Leigh, and Pescatori, 2014).

The key advantage of the narrative approach is its ability to precisely identify discretionary policy choices. This stands in contrast to the structural balance methodology which decomposes public spending and revenues into cyclically-linked and non-cyclical (discretionary) components. Identifying the cyclically-linked measures relies on *estimating* the sensitivity of automatic fiscal stabilizers to a measure of the economic cycle. Valid concerns can be raised of both the estimation of sensitivity and the appropriateness of the measure of the cycle (output gaps, growth or aggregate employment). The main shortcoming of this alternative fiscal measure is that it is only available to a maximum subset of 23 countries (see Table 1).

The results of this test confirm the robustness of our findings related to the fiscal stimulus. As Table 8 shows, the coefficient of the new interaction term is still significant and positive, albeit with a smaller value. Such small coefficient is most likely due to the reduction in the number of observations, particularly in the number of countries. However, if we take the high distribution values of ILO's identified fiscal measures from Table 1, the estimated profitability increase is not too smaller than that when the baseline fiscal impulse measure is employed.

B. Measuring Fiscal Stimulus through Government Expenditure Forecast Errors

For this test, as in Carrière-Swallow, David, and Leigh (2018),¹⁴ we collect the reported fiscal expenditures for year 2009 reported in the October 2010 WEO, taking them as “final” estimates. From those, we subtract projected 2009 fiscal expenditures as of the April 2008 WEO (the last WEO before Lehman Brothers collapse).

Since projections in 2008 for 2009 values are influenced by simultaneously estimated inflation projections, we adjust the spending projections by an amount equal to the inflation projection error (for example, if the country’s April 2008 WEO inflation projection error was zero, no adjustment is made). Finally, we use the 2008 final GDP as the denominator for this alternative measure since its role is to provide a scale to the stimulus and, moreover, the 2009 GDP would be endogenous to the fiscal policy and growth dynamics in the same year of 2009.

This approach of identifying fiscal actions via unexpected public spending over has the advantage that under the very limited forecast window, the actions by construction are deemed discretionary. But it has also shortcomings. First, forecasts themselves may be of low quality, potentially suffering from bias, inefficiency, and inaccuracy, which may affect the forecast errors. Second, the forecast-errors interpretation as fiscal actions is not direct, since those errors may reflect alternative factors, such as a change in relative prices or a data revision.

Tables 1, 2, and 3 indicate that such unexpected government spending (fiscal impulse), constructed as the post-crisis outturn minus its pre-crisis forecast is positive. For the full sample, its median is around 1.6 percent of GDP, with its first quartile still being positive.

As Table 9 evinces, our main findings are robust to this test. Again, the interaction term coefficient with that variable is slightly smaller than the baseline one, but still highly significant. Given that the number of countries in the sample is similar to the ones in our baseline specifications, the results (significance) of most other controls area also robust to this check.

¹⁴ For similar applications using the same dataset and methodology see also Lledó and Poplawski-Ribeiro (2013), Guerguil, Poplawski-Ribeiro, and Shabunina (2014), and Abiad, Furceri, and Topalova (2016).

VI. CONCLUDING REMARKS

This paper investigates whether the stimulative fiscal response to the global financial crisis impacted firms' profitability. Using firm-level data in cross-sectional analyses, our findings indicate firms' profitability improved markedly for industries more sensitive to the business cycle. In our full sample of economies, given the industry business cycle sensitivity, an increase in the structural deficit (i.e. *fiscal impulse*) of one percent of potential GDP is associated with a rise in corporate profits to assets ratio of around 0.3 percentage points, equivalent to half of the median increase in cross country/cross industry profitability of our data sample. This is true even after controlling for monetary policy interacted with investment capital dependency.

From a sectoral perspective, firms in the manufacturing, utilities, and retail were the only industries to have statistically significant, positive association with counter-cyclical fiscal policy. In terms of income groups, the positive effect of the stimulus is especially significant for the advanced economies in our sample. The findings further demonstrate that the results are robust to a more limited sample of countries that enacted positive fiscal impulse.

The results indicate that most of the impulse effect on firms' profitability comes from an increase in government spending, which is in line with the literature showing larger multipliers for this type of fiscal stimulus (e.g., Dell'Erba et al., 2018). The baseline results are further robust to the use of an alternative measure of discretionary fiscal stimulus during the crisis identified by the ILO through the narrative approach. They continue to hold if we instead replace our baseline impulse by IMF data on unanticipated (forecast errors) government expenditure.

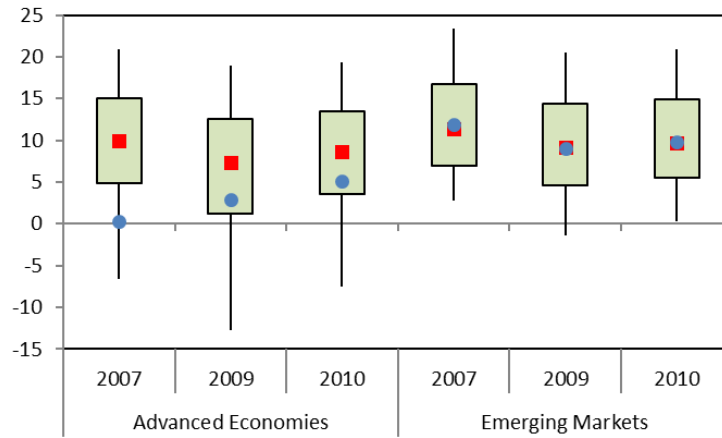
All in all, the analysis point to a key role of fiscal stimulus to increase firms' profitability during a period of large recession and financial constraints such as the GFC. Such empirical result confirms the relevance of fiscal policy to credit-constrained firms (Baum and Koester, 2011; and Koo, 2011). Importantly, the findings further corroborate at industry level the causal relationship between profits and investment at macro level (Blanchard, Rhee, and Summers, 1993; and Alesina et al., 2002). Such increase in firms' profitability would have been instrumental in raising subdued private investment during the GFC, particularly in advanced economies, helping to avoid their observed protracted recovery.

Several directions for further research could potentially be pursued. In particular, future research could investigate the impact of fiscal policy on firms sales, capital expenditure, the wage bill, or even firm employment. The latter two variables would be of particular interest given that lower income workers have the highest marginal propensity to spend. Finally, some of the sectoral results as well as a more detailed analysis about which revenue and expenditure instruments, i.e., types of taxes and spending (e.g., public investment, transfers,

purchase of goods and services) are more significant in affecting profitability could be further explored.

Figure 1. Box-Whisker: Profit (EBITDA) to Asset Ratios

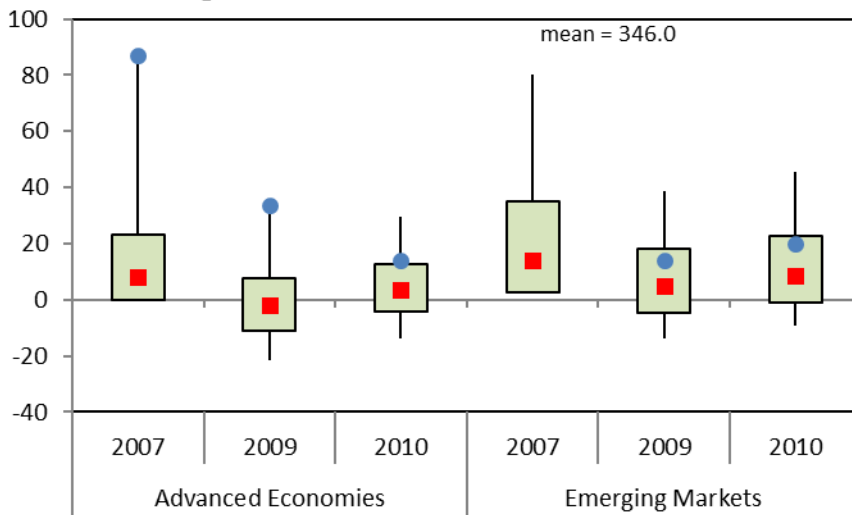
Profits to Assets Ratio: All Sectors¹



Sources: Thomson/Reuters Worldscope database and IMF staff calculations.
¹Percentiles of the distribution: 10th, bottom line; 25th bottom of box; 75th, top of box; 90th top line.
 Blue circle reports the mean and red box reports the median.

Figure 2. Box-Whisker Plots: Growth Rate of Total Assets

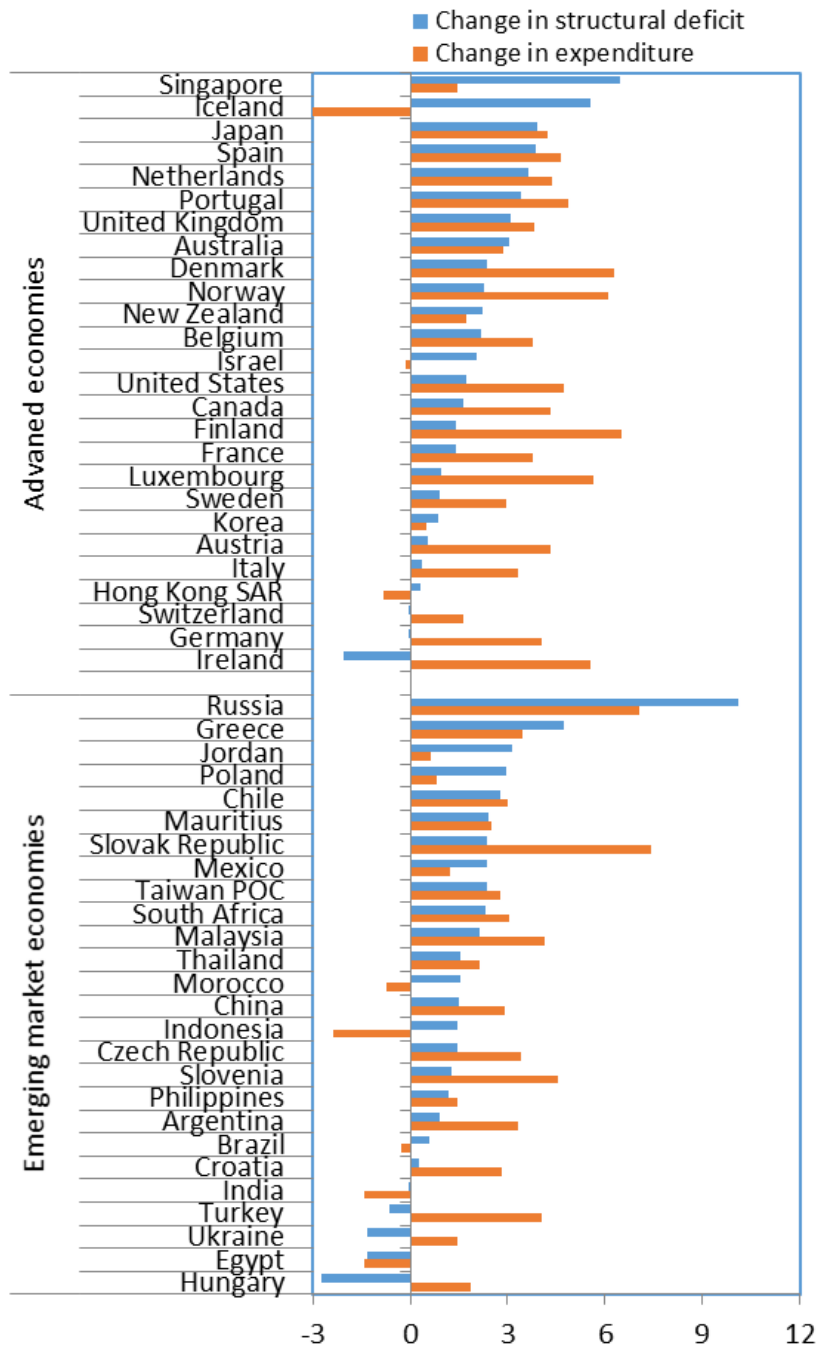
Percent Change in Total Assets: All Sectors¹



Sources: Thomson/Reuters Worldscope database and IMF staff calculations.
¹Percentiles of the distribution: 10th, bottom line; 25th bottom of box; 75th, top of box; 90th top line.
 Blue circle reports the mean and red box reports the median.

Figure 3. Fiscal Impulse¹, 2009

(Percent of potential GDP)



Sources: IMF, World Economic Outlook and IMF staff calculations.

¹ Change in structural fiscal balance between 2009 and 2008 times -1.

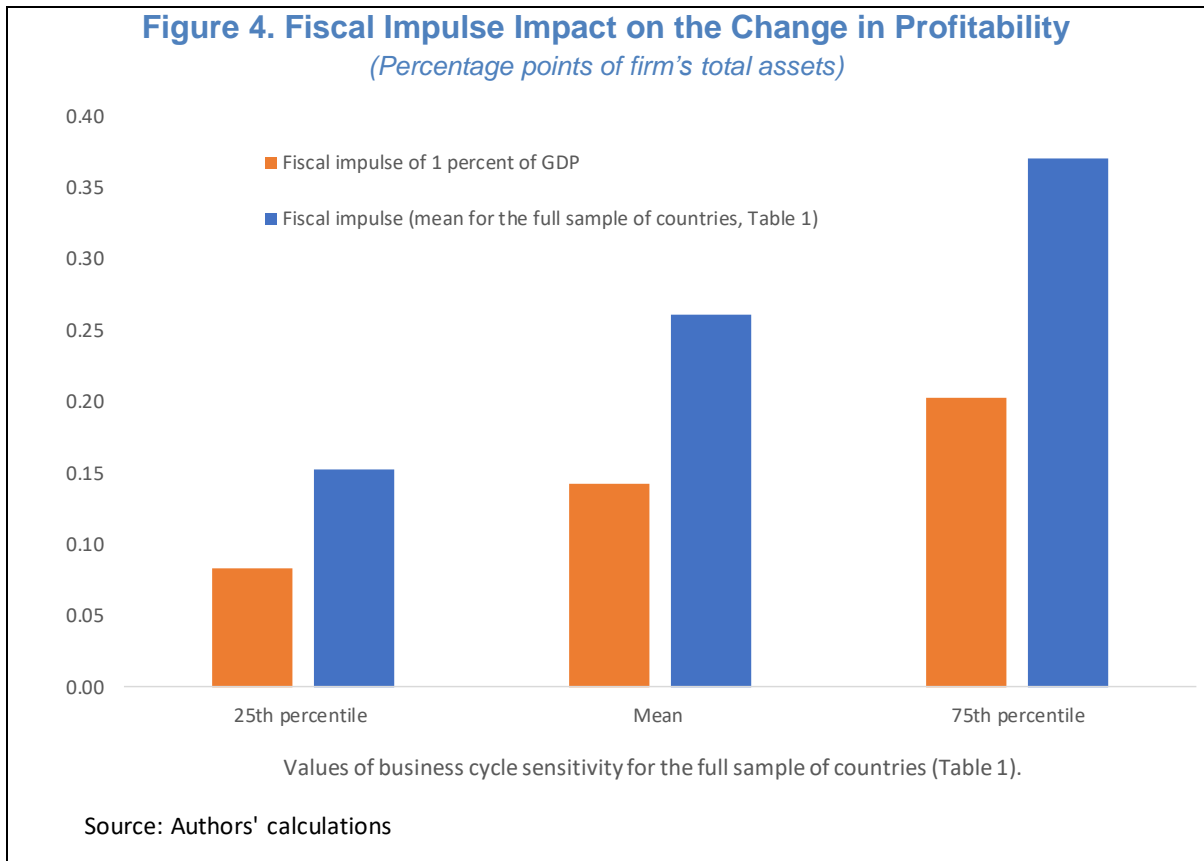


Table 1. Summary Statistics, Final Sample

	Number of observations	Mean	Median	Standard deviation	25th percentile	75th percentile
<i>Dependent variable</i>						
2007 Profits, percent of assets	17,960	4.82	10.51	208.69	5.82	15.64
2009 Profits, percent of assets	18,319	5.31	8.11	25.85	2.79	13.30
2010 Profits, percent of assets	18,319	6.97	9.01	24.78	4.40	14.05
Change in profits 2009-10, percent of assets	18,319	1.66	0.65	12.59	-2.29	4.43
<i>Firm specific controls</i>						
Change in Sales/Tot Assets (pct) 2009-10	18,319	-0.04	0.36	35.67	-9.43	10.09
2007 Total assets (log), thousands of USD	18,319	12.1	12.0	2.1	10.8	13.4
2007 Total debt (log), thousands of USD	18,319	5.6	5.7	2.6	4.1	7.3
2007 Cash and s.t. investments (log), thousands of USD	18,214	4.9	5.0	2.4	3.6	6.5
2007 Short term debt (log), thousands of USD	17,523	4.6	4.8	2.5	3.2	6.3
2007 Total liabilities, percent of assets	18,316	62.44	52.51	596.88	37.03	66.87
2007 Cash and s.t. investments, percent of assets	18,319	14.10	9.30	15.13	3.76	18.80
2007 Short term debt, percent of total debt	18,319	52.38	50.98	34.91	20.67	87.49
<i>Country policy variables</i>						
2008 Policy rate, percent	52	5.33	4.56	4.15	2.95	6.16
2009 Policy rate, percent	52	3.28	2.00	3.58	0.73	4.60
Change in policy rate 2009-08, percent	52	-2.06	-2.21	1.83	-3.12	-0.73
2008 Government structural balance, percent of potential GDP	52	-2.57	-2.61	3.85	-4.30	-0.36
2009 Government structural balance, percent of potential GDP	52	-4.40	-4.24	3.84	-6.43	-1.69
2008-09 Fiscal impulse, percent of potential GDP	52	1.83	1.59	2.09	0.73	2.59
2008 Government expenditure, percent of GDP	52	36.42	37.33	10.47	28.43	44.33
2009 Government expenditure, percent of GDP	52	39.14	42.33	11.34	30.26	47.38
2008-09 change in government expenditure	52	2.72	3.02	2.62	1.44	4.32
2009 Discretionary fiscal measures (ILO), percent of GDP	23	6.70	4.56	8.34	1.19	9.35
2009 IMF expenditure forecast error, percent of GDP	52	1.23	1.59	2.64	0.02	2.82
<i>Industry/Sector Sensitivities</i>						
Business cycle sensitivity	192	0.12	0.12	0.10	0.07	0.17
Dependency on external finance for working capital	192	0.09	0.01	0.91	-0.32	0.35
Dependency on external finance for capital investment	192	0.01	0.01	1.33	-0.38	0.37

Sources: Thomson Reuters Worldscope; IMF, World Economic Outlook; and national authorities.

Table 2. Summary Statistics, Advanced Economies

	Number of observation:	Mean	Median	Standard deviation	25th percentile	75th percentile
<i>Dependent variable</i>						
2007 Profits, percent of assets	11,005	0.31	9.95	266.22	4.89	14.98
2009 Profits, percent of assets	11,158	2.95	7.38	31.60	1.22	12.49
2010 Profits, percent of assets	11,158	5.12	8.62	30.42	3.61	13.50
Change in profits 2009-10, percent of assets	11,158	2.17	0.83	14.04	-2.17	5.06
<i>Firm specific controls</i>						
Change in Sales/Tot Assets (pct) 2009-10	11,158	-1.13	-0.45	37.32	-10.80	8.28
2007 Total assets (log), thousands of USD	11,158	12.4	12.3	2.2	11.0	13.8
2007 Total debt (log), thousands of USD	11,158	5.8	5.9	2.8	4.1	7.7
2007 Cash and s.t. investments (log), thousands of USD	11,056	5.3	5.3	2.3	4.0	6.8
2007 Short term debt (log), thousands of USD	10,619	4.7	4.8	2.6	3.1	6.3
2007 Total liabilities, percent of assets	11,156	67.29	53.33	759.38	37.85	67.74
2007 Cash and s.t. investments, percent of assets	11,158	15.38	10.11	16.43	4.32	20.26
2007 Short term debt, percent of total debt	11,158	46.59	42.42	34.47	15.10	77.52
<i>Country policy variables</i>						
2008 Policy rate, percent	26	3.69	4.00	1.88	2.44	4.63
2009 Policy rate, percent	26	1.37	1.10	1.17	0.40	1.99
Change in policy rate 2009-08, percent	26	-2.32	-2.64	1.38	-3.40	-1.17
2008 Government structural balance, percent of potential GDP	26	-2.03	-1.72	3.83	-3.89	0.83
2009 Government structural balance, percent of potential GDP	26	-4.03	-4.24	3.83	-7.38	-0.69
2008-09 Fiscal impulse, percent of potential GDP	26	2.00	1.87	1.83	0.86	3.09
2008 Government expenditure, percent of GDP	26	40.37	42.08	10.02	35.73	48.26
2009 Government expenditure, percent of GDP	26	43.59	45.86	10.89	39.98	51.13
2008-09 change in government expenditure	26	3.22	3.92	2.81	1.71	4.71
2009 Discretionary fiscal measures (ILO), percent of GDP	10	6.98	2.97	10.79	1.19	6.61
2009 IMF expenditure forecast error, percent of GDP	26	2.08	1.78	1.75	1.46	2.91
<i>Industry/Sector Sensitivities</i>						
Business cycle sensitivity	120	0.12	0.11	0.11	0.06	0.16
Dependency on external finance for working capital	120	0.18	0.14	0.98	-0.28	0.44
Dependency on external finance for capital investment	120	-0.11	-0.01	0.91	-0.52	0.33

Sources: Thomson Reuters Worldscope; IMF, World Economic Outlook; and national authorities.

Table 3. Summary Statistics, Emerging Market Economies

	Number of observation:	Mean	Median	Standard deviation	25th percentile	75th percentile
<i>Dependent variable</i>						
2007 Profits, percent of assets	6,955	11.95	11.37	15.32	6.96	16.73
2009 Profits, percent of assets	7,161	9.00	9.18	11.45	4.60	14.44
2010 Profits, percent of assets	7,161	9.87	9.66	10.72	5.47	14.90
Change in profits 2009-10, percent of assets	7,161	0.87	0.37	9.89	-2.49	3.63
<i>Firm specific controls</i>						
Change in Sales/Tot Assets (pct) 2009-10	7,161	1.67	2.00	32.87	-7.40	12.81
2007 Total assets (log), thousands of USD	7,161	11.7	11.6	1.7	10.5	12.8
2007 Total debt (log), thousands of USD	7,161	5.3	5.4	2.4	4.0	6.8
2007 Cash and s.t. investments (log), thousands of USD	7,158	4.3	4.5	2.4	2.8	5.9
2007 Short term debt (log), thousands of USD	6,904	4.6	4.8	2.3	3.4	6.2
2007 Total liabilities, percent of assets	7,160	54.87	51.23	113.22	35.98	65.44
2007 Cash and s.t. investments, percent of assets	7,161	12.10	8.15	12.59	2.99	16.88
2007 Short term debt, percent of total debt	7,161	61.42	65.95	33.65	32.94	96.82
<i>Country policy variables</i>						
2008 Policy rate, percent	26	6.98	5.57	5.09	3.67	8.98
2009 Policy rate, percent	26	5.19	4.33	4.15	2.01	8.58
Change in policy rate 2009-08, percent	26	-1.79	-1.48	2.19	-2.77	-0.30
2008 Government structural balance, percent of potential GDP	26	-3.10	-2.78	3.87	-4.57	-0.55
2009 Government structural balance, percent of potential GDP	26	-4.77	-4.17	3.88	-5.92	-2.10
2008-09 Fiscal impulse, percent of potential GDP	26	1.67	1.52	2.35	0.60	2.37
2008 Government expenditure, percent of GDP	26	32.46	33.06	9.53	23.84	39.44
2009 Government expenditure, percent of GDP	26	34.68	33.47	10.12	26.34	43.84
2008-09 change in government expenditure	26	2.22	2.64	2.36	0.81	3.39
2009 Discretionary fiscal measures (ILO), percent of GDP	12	6.46	6.60	6.12	1.53	9.56
2009 IMF expenditure forecast error, percent of GDP	26	0.39	0.57	3.11	-0.76	2.62
<i>Industry/Sector Sensitivities</i>						
Business cycle sensitivity	72	0.12	0.12	0.10	0.08	0.18
Dependency on external finance for working capital	72	-0.06	-0.12	0.75	-0.35	0.13
Dependency on external finance for capital investment	72	0.20	0.06	1.82	-0.24	0.40

Sources: Thomson Reuters Worldscope; IMF, World Economic Outlook; and national authorities.

Table 4. Results for All Countries for Profitability

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	ALL	ALL	ALL	ALL	ALL	ALL	ALL	AEs	EMs
<i>Fiscal Impulse * business cycle sensitivity¹</i>	2.926*** (4.471)	2.823*** (4.512)	2.318*** (4.658)	1.374*** (3.160)	2.272*** (4.148)	2.656*** (4.843)	1.191*** (3.069)	1.703*** (3.044)	0.384 (0.872)
<i>Change in policy rate * working capital dependency</i>	-0.042 (-0.852)	-0.049 (-1.026)	0.011 (0.210)	-0.014 (-0.341)	0.033 (0.744)	0.038 (0.718)			
<i>Change in policy rate * investment capital dependency</i>	-0.063** (-2.127)	-0.058* (-1.960)	-0.076** (-2.440)	-0.071** (-2.491)	-0.089*** (-2.949)	-0.086*** (-2.676)	-0.053** (-2.130)	-0.075* (-1.689)	-0.029* (-1.748)
<i>Change in sales, 2009-10 (percent of assets)</i>		0.046*** (6.416)					0.046*** (6.129)	0.039*** (3.917)	0.058*** (6.139)
<i>Size: total assets, 2007 (log, thousand USD)</i>			0.163*** (3.981)				-0.214** (-2.474)	-0.318** (-2.522)	-0.016 (-0.149)
<i>Leverage: total debt 2007 (log, thousand USD)</i>				0.203*** (6.197)			0.291*** (4.470)	0.332*** (3.777)	0.174 (1.267)
<i>Balance sheet liquidity: cash, 2007 (percent of assets)</i>					0.043*** (4.981)		0.014 (1.106)	0.018 (1.061)	-0.009 (-0.680)
<i>Short term debt, 2007 (percent of total debt)</i>						0.015*** (4.014)	0.006* (1.766)	0.007 (1.502)	0.002 (0.332)
Observations	22,333	22,326	18,559	21,289	21,247	18,350	18,319	11,158	7,161
R-squared	0.021	0.037	0.024	0.027	0.025	0.024	0.046	0.045	0.058
Adjusted R-squared	0.018	0.034	0.021	0.024	0.023	0.021	0.044	0.0423	0.0541
Number of Countries	52	52	52	52	52	52	52	26	26

Notes: All estimations include country fixed-effects. Robust t-statistics in parentheses; results robust to clustered standard errors.

Significance at *** p<0.01; ** p < 0.05; * p < 0.10. All = all countries in sample; AE = advanced economies; EMs = Emerging Economies.

¹ Fiscal impulse is defined as the change in government expenditure³ in percent of GDP.

Table 5. Asymmetric Effects of Fiscal Stimulus on Firms' Profitability

Variables	All signs	Positive fiscal impulse		
	All	All	AEs	EMs
<i>Fiscal Impulse * business cycle sensitivity</i> ¹	1.191*** (3.069)	1.176*** (3.022)	1.715*** (3.058)	0.365 (0.831)
<i>Change in policy rate * investment capital dependency</i>	-0.053** (-2.130)	-0.058** (-2.087)	-0.084* (-1.803)	-0.029* (-1.769)
<i>Change in sales, 2009-10 (percent of assets)</i>	0.046*** (6.129)	0.045*** (5.483)	0.040*** (3.794)	0.055*** (4.937)
<i>Size: total assets, 2007 (log, thousand USD)</i>	0.291*** (4.470)	0.299*** (4.135)	0.325*** (3.548)	0.245 (1.382)
<i>Leverage: total debt 2007 (log, thousand USD)</i>	-0.214** (-2.474)	-0.227** (-2.292)	-0.307** (-2.324)	-0.043 (-0.326)
<i>Balance sheet liquidity: cash, 2007 (percent of assets)</i>	0.014 (1.106)	0.014 (1.010)	0.018 (0.971)	-0.007 (-0.425)
<i>Short term debt, 2007 (percent of total debt)</i>	0.006* (1.766)	0.007* (1.799)	0.009* (1.698)	0.002 (0.263)
Observations	18,319	15,948	10,546	5,402
R-squared	0.046	0.044	0.044	0.053
Adj R-squared	0.0435	0.0412	0.0410	0.0483
F test	8.387	8.232	10.44	5.401
Prob > F	0	0	0	0
No of Countries	52	44	23	21

Notes: All estimations include country fixed-effects. Robust t-statistics in parentheses; results robust to clustered standard errors.

Significance at *** p<0.01; ** p < 0.05; * p < 0.10. All = all countries in sample; AE = advanced economies; EMs = Emerging Economies.

¹ Fiscal impulse is defined as the negative of the change in structural fiscal balance in percent of potential GDP.

Table 6a. Horse Race Results Per Sector for Profitability

Variables	Manufacturing			Construction			Transportation			Wholesale		
	All	AEs	EMs	All	AEs	EMs	All	AEs	EMs	All	AEs	EMs
<i>Fiscal Implus * business cycle sensitivity¹</i>	1.742** (2.291)	3.201** (2.531)	0.408 (0.625)	-2.123 (-1.622)	-2.164 (-1.167)	-1.494 (-0.841)	1.489 (1.176)	2.556 (1.584)	-0.134 (-0.075)	-0.060 (-0.035)	-1.239 (-0.663)	2.195 (0.682)
<i>Change in policy rate * investment capital dependency</i>	0.016 (0.224)	0.074 (0.785)	-0.061 (-0.680)	-0.035 (-1.383)	-0.062 (-1.402)	-0.005 (-0.251)	0.287 (0.498)	0.301 (0.438)	0.867 (0.847)	-0.390*** (-2.843)	-0.566*** (-3.165)	-0.026 (-0.120)
<i>Change in sales, 2009-10 (percent of assets)</i>	0.082*** (9.360)	0.083*** (6.587)	0.079*** (7.201)	0.065*** (3.636)	0.041 (1.498)	0.094*** (3.724)	0.025 (1.157)	0.030 (1.134)	0.016 (0.516)	-0.008 (-0.384)	-0.016 (-0.626)	0.019 (1.164)
<i>Size: total assets, 2007 (log, thousand USD)</i>	0.388*** (4.283)	0.435*** (3.409)	0.292** (1.978)	0.102 (0.403)	0.065 (0.169)	0.004 (0.008)	0.516* (1.719)	0.343 (0.939)	1.546** (2.088)	0.565*** (2.713)	0.566** (2.394)	0.695 (1.135)
<i>Leverage: total debt 2007 (log, thousand USD)</i>	-0.218* (-1.812)	-0.366* (-1.946)	0.020 (0.184)	-0.005 (-0.015)	0.078 (0.125)	-0.127 (-0.477)	-0.579 (-1.341)	-0.441 (-0.806)	-0.842 (-1.203)	-0.680** (-2.128)	-0.675* (-1.818)	-0.712 (-1.152)
<i>Balance sheet liquidity: cash, 2007 (percent of assets)</i>	0.004 (0.240)	0.007 (0.312)	-0.017 (-1.318)	0.004 (0.153)	0.018 (0.388)	0.002 (0.051)	0.005 (0.115)	-0.021 (-0.427)	0.017 (0.245)	0.010 (0.207)	0.066 (1.126)	-0.109* (-1.814)
<i>Short term debt, 2007 (percent of total debt)</i>	0.002 (0.455)	0.003 (0.457)	-0.001 (-0.169)	0.010 (0.964)	-0.003 (-0.205)	0.019 (1.513)	-0.032 (-1.165)	0.026 (0.795)	-0.110*** (-3.025)	0.016 (1.509)	0.008 (0.623)	0.039** (2.042)
Observations	10,564	5,884	4,680	924	454	470	563	367	196	1,075	725	350
R-squared	0.074	0.075	0.078	0.163	0.127	0.258	0.201	0.132	0.350	0.097	0.108	0.127
Adj R-squared	0.0690	0.0700	0.0710	0.115	0.0694	0.209	0.116	0.0519	0.233	0.0531	0.0694	0.0540
F test	9.963	11.38	5.971								3.229	
Prob > F	0	0	0								0	

Notes: All estimations include country fixed-effects. Robust t-statistics in parentheses; results robust to clustered standard errors.

Significance at *** p < 0.01; ** p < 0.05; * p < 0.10. All = all countries in sample; AE = advanced economies; EMs = Emerging Economies.

¹ Fiscal impulse is defined as the negative of the change in structural fiscal balance in percent of potential GDP.

Table 6b. Horse Race Results Per Sector for Profitability (Concluded)

Variables	Utilities			Retail			Services		
	All	AEs	EMs	All	AEs	EMs	All	AEs	EMs
<i>Fiscal Impluse * business cycle sensitivity¹</i>	4.272*	9.933***	-1.260	6.109*	6.495*	7.536	1.319	1.516	0.166
	(1.691)	(2.663)	(-0.685)	(1.958)	(1.833)	(0.966)	(1.441)	(1.437)	(0.089)
<i>Change in policy rate * investment capital dependency</i>	-0.408	-0.118	-0.804**	0.852	0.991	0.196	-0.448***	-0.439**	-0.216
	(-0.924)	(-0.178)	(-2.277)	(1.439)	(1.236)	(0.217)	(-2.910)	(-2.581)	(-0.636)
<i>Change in sales, 2009-10 (percent of assets)</i>	0.042***	0.047***	0.035***	0.008	0.018	-0.023	0.025	0.018	0.050**
	(4.934)	(4.519)	(3.168)	(0.509)	(1.463)	(-0.505)	(1.482)	(0.942)	(2.144)
<i>Size: total assets, 2007 (log, thousand USD)</i>	-0.129	-0.257	-0.458	0.570**	0.407	0.149	0.128	0.176	-0.454
	(-0.752)	(-1.253)	(-1.159)	(2.064)	(1.189)	(0.164)	(0.955)	(1.059)	(-1.102)
<i>Leverage: total debt 2007 (log, thousand USD)</i>	0.169	0.299	0.269	-0.771*	-0.472	-1.264	-0.130	-0.229	0.272
	(0.679)	(0.972)	(0.679)	(-1.766)	(-0.895)	(-1.629)	(-0.719)	(-0.986)	(1.052)
<i>Balance sheet liquidity: cash, 2007 (percent of assets)</i>	-0.027	-0.030	-0.031	-0.098*	-0.103	-0.062	0.053*	0.052	0.043
	(-0.740)	(-0.542)	(-0.808)	(-1.934)	(-1.601)	(-0.990)	(1.848)	(1.557)	(1.078)
<i>Short term debt, 2007 (percent of total debt)</i>	0.024*	0.015	0.028	-0.028*	-0.025	-0.029*	0.007	0.009	-0.004
	(1.733)	(0.746)	(1.605)	(-1.680)	(-1.175)	(-1.837)	(0.776)	(0.772)	(-0.301)
Observations	1,237	737	500	980	743	237	2,976	2,248	728
R-squared	0.097	0.103	0.112	0.091	0.070	0.239	0.052	0.047	0.102
Adj R-squared	0.0538	0.0638	0.0515	0.0406	0.0318	0.129	0.0338	0.0331	0.0619
F test									
Prob > F									

Notes: All estimations include country fixed-effects. Robust t-statistics in parentheses; results robust to clustered standard errors.

Significance at *** p<0.01; ** p < 0.05; * p < 0.10. All = all countries in sample; AE = advanced economies; EMs = Emerging Economies.

¹ Fiscal impulse is defined as the negative of the change in structural fiscal balance in percent of potential GDP.

Table 7. Expenditure-Based Fiscal Stimulus

VARIABLES	All signs	Only expenditure increases		
	All	All	AEs	EMs
<i>Fiscal Impulse * business cycle sensitivity¹</i>	0.965** (2.520)	0.980** (2.526)	1.200** (2.365)	0.231 (0.506)
<i>Change in policy rate * investment capital dependency</i>	-0.053** (-2.109)	-0.058* (-1.802)	-0.073 (-1.498)	-0.029 (-1.196)
<i>Change in sales, 2009-10 (percent of assets)</i>	0.046*** (6.127)	0.047*** (5.538)	0.041*** (3.698)	0.061*** (5.253)
<i>Size: total assets, 2007 (log, thousand USD)</i>	0.264*** (4.084)	0.277*** (3.829)	0.317*** (3.402)	0.244 (1.383)
<i>Leverage: total debt 2007 (log, thousand USD)</i>	-0.202** (-2.340)	-0.223** (-2.243)	-0.329** (-2.447)	-0.009 (-0.070)
<i>Balance sheet liquidity: cash, 2007 (percent of assets)</i>	0.014 (1.064)	0.015 (1.012)	0.017 (0.909)	-0.005 (-0.327)
<i>Short term debt, 2007 (percent of total debt)</i>	0.006* (1.650)	0.005 (1.279)	0.006 (1.189)	0.000 (0.047)
Observations	18,319	15,570	10,328	5,242
R-squared	0.047	0.047	0.045	0.064
Adj R-squared	0.0435	0.0439	0.0423	0.0585
F test	8.406	8.309	10.30	6.040
Prob > F	0	0	0	0
No of Countries	52	44	23	21

Notes: All estimations include country fixed-effects. Robust t-statistics in parentheses; results robust to clustered standard errors.

Significance at *** p<0.01; ** p < 0.05; * p < 0.10. All = all countries in sample; AE = advanced economies; EMs = Emerging Economies.

¹ Fiscal impulse is defined as the change in government expenditure in percent of GDP.

Table 8. Results with ILO Discretionary Fiscal Stimulus

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	ALL	ALL	ALL	ALL	ALL	ALL	ALL	AEs	EMs
<i>Fiscal stimulus (ILO) * business cycle sensitivity</i>	1.738*** (6.048)	1.649*** (6.059)	1.436*** (4.432)	0.959*** (3.164)	1.383*** (4.902)	1.476*** (4.954)	0.470* (1.670)	0.873* (1.888)	-0.187 (-0.790)
<i>Change in policy rate * working capital dependency</i>	-0.020 (-0.354)	-0.023 (-0.417)	0.028 (0.396)	0.003 (0.049)	0.072 (1.330)	0.057 (0.813)			
<i>Change in policy rate * investment capital dependency</i>	-0.068 (-1.544)	-0.067 (-1.511)	-0.088* (-1.786)	-0.080* (-1.897)	-0.103** (-2.251)	-0.094* (-1.816)	-0.052 (-1.204)	-0.080 (-1.245)	-0.001 (-0.030)
<i>Change in sales/asset ratio (percent) 2009-10</i>		0.049*** (5.387)							
<i>Leverage: total debt (log, thousand USD), 2007</i>			0.084* (1.791)				-0.284** (-2.281)	-0.490** (-2.530)	0.057 (0.392)
<i>Size: total assets (log, thousand USD), 2007</i>				0.148*** (4.345)			0.324*** (3.650)	0.398*** (2.969)	0.149 (0.846)
<i>Balance sheet liquidity: cash to assets ratio, 2007</i>					0.042*** (3.931)		0.012 (0.652)	0.008 (0.310)	-0.002 (-0.087)
<i>Short term debt to total debt ratio, 2007</i>						0.015*** (3.070)	0.005 (1.012)	0.004 (0.551)	0.000 (0.033)
Observations	12,712	12,708	10,307	11,996	11,967	10,127	10,111	5,431	4,680
Adjusted R-squared	0.022	0.039	0.022	0.026	0.027	0.023	0.027	0.033	0.015
Number of Countries	23	23	23	23	23	23	23	9	14

Notes: All estimations include country fixed-effects. Robust t-statistics in parentheses; results robust to clustered standard errors. Significance at

*** p<0.01, ** p<0.05, * p<0.1. AEs = advanced economies. Fiscal stimulus is defined here as the discretionary government spending during the crisis identified by the ILO.

Table 9. Results with IMF WEO Spending Forecast Errors

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	ALL	ALL	ALL	ALL	ALL	ALL	ALL	AEs	EMs
<i>Fiscal stimulus * business cycle sensitivity</i> ¹	2.535*** (6.723)	2.422*** (6.835)	2.329*** (5.081)	1.837*** (3.992)	2.219*** (5.749)	2.274*** (5.587)	0.935** (2.206)	1.101** (2.062)	0.011 (0.023)
<i>Change in policy rate * working capital dependency</i>	0.001 (0.028)	-0.008 (-0.186)	0.049 (1.012)	0.002 (0.049)	0.044 (1.032)	0.063 (1.316)			
<i>Change in policy rate * investment capital dependency</i>	-0.072** (-2.536)	-0.067** (-2.338)	-0.088*** (-2.817)	-0.076*** (-2.654)	-0.090*** (-3.041)	-0.091*** (-2.892)	-0.053** (-2.071)	-0.073 (-1.604)	-0.028* (-1.718)
<i>Change in sales/asset ratio (percent) 2009-10</i>		0.045*** (6.413)					0.046*** (6.129)	0.039*** (3.901)	0.058*** (6.148)
<i>Leverage: total debt (log, thousand USD), 2007</i>			0.030 (0.755)				-0.190** (-2.192)	-0.289** (-2.288)	-0.016 (-0.149)
<i>Size: total assets (log, thousand USD), 2007</i>				0.097*** (2.873)			0.234*** (3.477)	0.268*** (2.916)	0.175 (1.270)
<i>Balance sheet liquidity: cash to assets ratio, 2007</i>					0.028*** (3.409)		0.013 (1.031)	0.017 (0.985)	-0.009 (-0.667)
<i>Short term debt to total debt ratio, 2007</i>						0.009** (2.528)	0.006 (1.594)	0.007 (1.335)	0.002 (0.327)
Observations	22,333	22,326	18,559	21,289	21,247	18,350	18,319	11,158	7,161
Adjusted R-squared	0.024	0.040	0.025	0.026	0.027	0.025	0.044	0.042	0.054
Number of Countries	52	52	52	52	52	52	52	26	26

Notes: All estimations include country fixed-effects. Robust t-statistics in parentheses; results robust to clustered standard errors.

Significance at *** p<0.01; ** p < 0.05; * p < 0.10. All = all countries in sample; AE = advanced economies; EMs = Emerging Economies.

¹ Fiscal stimulus is defined here as the unexpected government spending calculated as the final spending for 2009 minus IMF staff projections for 2009 spending as recorded in the April 2008 WEO, in percent of 2008 GDP.

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