Fiscal Stimulus and Firms’ Sales and Capital Expenditure During the Global Financial Crisis

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Abstract
Using firm-level data from the Refinitiv Datastream Worldscope database for more than 17,253 non-financial firms in 45 advanced and emerging economies, this paper examines how fiscal stimulus interacted with sectoral business cycle sensitivity has affected firms’ sales and capital expenditures during the global financial crisis. Cross-sectional analyses indicate that reductions in structural fiscal balances are associated with higher firms’ sales and capital expenditures (as percentage of their total assets) in 2009. This result is obtained notably for the manufacturing and construction industries and for different regions depending on the firm performance variable. Our findings have key implications for the design of fiscal response to shocks at industry and firm levels, including during the current COVID-19 pandemic.

Keywords Fiscal stimulus · Global financial crisis · Firm sales and capital expenditures · Firm-level data

JEL Classification C33 · E32 · E62 · H62

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**Introduction**

Until the current COVID-19 crisis, the stimulative response to the 2007–2009 global financial crisis (GFC) was unique in the post-depression era in that so many countries engaged in expansionary fiscal and monetary policies. The GFC period has many elements of a natural policy experiment given the high degree of simultaneity of countries responding to the crisis at the same time and in the same direction. However, more than twelve years after the GFC, the effectiveness and transmission channels of those measures to firms (particularly the fiscal ones) remain concealed. While several studies have analyzed the macroeconomic impact of stimulus, the literature is scarce on their influence at firm level.

Understanding the effects of those stimuli at firm and industry level should, therefore, be documented and explored to better tailor policy responses. This takes on particular relevance amidst the current COVID-19 crisis, in which the shock has hit different industries and geographic regions in a highly heterogeneous manner, notably with contact-intensive industries being substantially more affected than others.

Exploring this gap in the literature, this paper investigates the empirical effects of the fiscal and monetary stimulus enacted immediately after the GFC on corporate sales and capital expenditure (capex). It performs such analysis by estimating the impact of a *fiscal impulse* (i.e., a negative change in the structural primary balance) and *monetary stimulus* (measured by the annual change in short-term interest rate) on the yearly change (between 2008 and 2009) in the ratios of sales and capex to total assets at firm level, scaled by a business cycle sensitivity coefficient at industry level.

To measure firm responses, a dataset is constructed using financial statement data from more than 17,253 non-financial firms in 45 advanced economies (AEs) and emerging economies between 2008 and 2010. The firm-level data is obtained from the Refinitiv Worldscope database that compiles publicly traded firms’ balance sheet information (see also Ağca and Celasun 2012; Medina 2012).

At a first glance, the distribution of the change in the firms’ ratios of sales and capital expenditures to their total assets during the GFC already indicates a recovery in the performance of those firms as policy stimulus was provided (Panels I, II, and III of Fig. 1). Panel IV of Fig. 1 further suggests a positive association between sample countries’ fiscal impulses—identified by negative changes in their structural fiscal balances—and the change in the average firm ratio of sales to its total assets at country level in 2009.

Nevertheless, few papers have looked into corporate responses to fiscal policy at the firm level, particularly during the GFC. To the best of our knowledge, Claessens et al. (2012) and Correa-Caro et al. (2018) were among the few who developed innovative specifications to analyze firm behavior during the contraction stage of the GFC (see “Literature review” section).

In this paper, we complement and expand this research. We complement Correa-Caro et al. (2018) by estimating how the (fiscal and monetary) stimulus is associated with the annual change in firms’ ratios of sales and capex to their total
assets instead of with the change in firms’ profitability. We further expand Claessens et al. (2012) by investigating in more detail the fiscal and monetary stimuli. While those authors’ focus is to check whether intrinsic firms’ characteristics (i.e., degree of sensitivity to the business cycle, exposure to trade, and financial dependence) help in explaining their ex post “performance,” in our paper, we investigate more in depth the role of fiscal and monetary stimuli.

Our paper further looks carefully on the issue of potential endogeneity related to the fiscal and monetary stimuli. To address that issue, we instrument the fiscal impulse by a measure of unanticipated government spending as in Carrière-Swallow et al. (2021) and Born et al. (2020), which is correlated to the fiscal stance but by construction exogenous to the business cycle potentially driving firms’ profits. We also instrument our measure of monetary stimulus—changes in short-term interest—and other firms’ characteristics controlled for by their first lag. We further perform robustness checks to our identification strategy for both, the fiscal and the monetary stimuli.

The results show a positive association between the improvement in the firms’ ratios of sales and capex to their total assets and the fiscal stimulus in 2009. For our full sample, the average increase in the structural deficit (fiscal impulse) in 2009—1.8 percent of potential GDP—is significantly associated with an increase of 1.4 percentage points in the firms’ ratio of sales to total assets and of 0.16 percentage points in the firms’ ratio of capex to total assets. These results are obtained for both variables after interacting them with an indicator for the average business cycle sensitivity. Both outcomes are also above the (negative) median change of those firms’ performance ratios in 2009, suggesting a meaningful economic impact of the fiscal

**Fig. 1** Change in firm sales, in capital expenditures, in total sales and fiscal impulse during the GFC. 
*Source: Refinitiv Worldscope database; and authors’ calculations.*
stimulus. The monetary stimulus, in turn, is less significant in explaining the change in sales and capex in 2009 for our full sample. It has a more significant impact for some of the regions investigated in our analyses, though. Initial firm’s characteristics—such as asset size, debt, and leverage ratios—are also found to matter for sales and capital expenditure performance during the GFC recovery.

Several additional tests and robustness checks are performed. Sectoral analyses, for example, show that the fiscal stimulus impacts on corporate sales and capex are felt most significantly in manufacturing and to some subsamples in the construction, wholesale, services, and utilities industries. Regional analyses indicate that the fiscal and monetary stimuli were more statistically relevant for the increase in sales (as percentage of total assets) of European firms. For capex, the stimuli impacted more Asian and Canadian firms. Our baseline results also survive a series of robustness checks, including the addition of an extra year (2010) of data (creating a panel data setup) as well as the change in some of our industry-level interaction terms.

Our findings, therefore, contribute to the academic and policy debate on the impacts and multiplier effects of policy stimulus during economic and financial crises. They have also key implications for the design of fiscal response to shocks at industry and firm levels, particularly in the case of the current response to the COVID-19 pandemic. The pandemic caused a substantial dispersion across industries and world regions, notably depending on the social-contacting intensity of the activity of a particular industry (Leibovici et al. 2020) or region and, thus, calling for a precise calibration of government financial support case by case.

The analysis presented here has two caveats to bear in mind. First, it employs only publicly listed firms (representing on average about 11.4 percent of GDP) that tend to be larger, more open, and more likely to find easier access to financing. Hence, the findings cannot claim to be representative of the entire non-financial corporate sector of most countries. Second, its sample period (immediately following the 2008 crisis) is unique in the synchronicity of slowing growth and countercyclical fiscal and monetary policies across advanced and emerging economies. Absent these conditions, researchers could devote more efforts to controlling for policy spillovers emanating from other countries.

The rest of the paper is organized as follows: “Literature review” section. Describes the “Methodology and econometric model of the paper” section. Discusses the “Results” section. “Robustness checks and additional tests” section. At last, “Concludes” section the paper.

**Literature Review**

This paper follows closely Claessens et al. (2012) and Correa-Caro et al. (2018). Claessens et al. (2012) examine how the 2007–2009 crisis affected firm performance, using financial statement data for 7722 non-financial firms in 42 countries. They 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. We expand their analysis by introducing an identification strategy for the fiscal and monetary stimuli (or shocks) estimated on the paper. Our instrumental variables identify a significant role for fiscal policy, while monetary policy loses significance. The monetary stimulus does remain significant for some subsamples, though.

Correa-Caro et al. (2018), in turn, examine how fiscal stimulus during the GFC impacted corporate profitability. Using a similar measure of fiscal stimulus (i.e., the fiscal impulse of the negative change in the structural primary balance) and firm-level data (Refinitiv Worldscope database) for 22,330 non-financial firms in 52 advanced and emerging economies, the authors find that a reduction in the structural primary balance was statistically significantly associated with an increase in profitability—measure as the ratio between profits (EBITIDA) and total assets of the firm—after the GFC fiscal stimulus. Our main difference to that paper is our investigation of the association of the fiscal and monetary stimuli with the change in sales and in capex instead of with the change in profitability.

Our paper further draws on Medina (2012), who studied corporate performance in the aftermath of the GFC employing a sample of 6581 manufacturing firms in 48 developed and developing countries in 2010. Important for our use of interaction terms and firms’ initial conditions, this paper, in a cross-sectional analysis, identifies factors of resilience as well as vulnerability that show pre-crisis leverage and short-term debt suppressing the speed of the recovery. The main difference to our paper is that it does not investigate the effect of fiscal and monetary stimulus on corporate performance like ours.

Our paper is moreover related to the literature on fiscal multipliers and on the evaluation of macroeconomic policy effects on sectoral variables (e.g., Perotti 2008; Aghion et al. 2014; Nekarda and Ramey 2011; Mineshima et al. 2014; Dell’Erba et al. 2018). It is also somewhat connected to the literature at macro-level on fiscal multipliers during recessions (Auerbach and Gorodnichenko 2012; Baum et al. 2012).

On the multiplier literature at industry level, Nekarda and Ramey’s (2011), for example, use the Manufacturing Industry Database (MID) to investigate industry-level effects of government purchases and the transmission mechanism for government spending on the aggregate economy. Their findings suggest that increases in government demand raise output and hours, which is consistent with our own finding of a positive association of higher sales and capex with a fiscal shock. Schwellnus and Arnold (2008) and Arnold et al. (2011), in turn, find that economic growth can be increased by gradually moving the tax base toward consumption and immovable property. Different from us, they find that reducing corporate taxes—one potential way to raise the fiscal impulse—is unlikely to be growth-enhancing.

At the macro-level (country) instead, Alesina et al. (2002) 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.
Methodologically, the use of firm-level data to understand the effects of policies stimuli on the economy helps us in addressing Aghion et al.’s (2014) three issues in identifying causal relationships between fiscal stimulus and growth outcomes in a cross-country setting. The first advantage is that even though the stimulus of fiscal policy is estimated at the country level with a time-invariant coefficient, which implies that fiscal policy countercyclicality in each country is collinear to that country’s dummy, the interaction between the country-level measure of countercyclicality and the industry-level variable is not. Second, at the firm level, there are enough observations to ensure that the results withstand the introduction of country and industry dummies plus the set of structural variables as additional controls. Finally, macroeconomic policy should affect the firm-level ratio of sales and capex to total assets, whereas causality in the opposite direction is less likely to hold. Thus, the presence of a positive and significant interaction coefficient in the industry-level regressions is more likely to reflect a causal impact of the cyclical pattern of fiscal policy on those firm performance ratios. However, the downside of our firm-level investigation is that our cross-country/cross-industry analysis has little to say about the aggregate magnitude of the sales and capital expenditures increases/reductions at aggregate level induced by the fiscal stimulus.

Methodology

Corporate and Macroeconomic Data

The source for firm-level financial statement data employed in this study is the Refinitiv Datastream Worldscope database. It contains income statement, balance sheet, and cashflow items for publically traded firms. By nature of being publicly listed, these firms tend to be exporting-led and among the largest operating in a country.1 The grouping of firms by sector follows the Standard Industrial Classification (SIC) that is reported for each firm by Worldscope. Table 1 lists the countries and industries included in our estimations.

The baseline regressions for 2009 contains at least 17,253 firms (for the sales ratio) in 29 AEs and 16 EMs when all controls are added. The baseline estimations also exclude data for countries in which surprises on the changes of expenditures are excessively high, i.e., above or below the top and bottom fifth quantile. The United States (US) is excluded from our sample since the country was both the source of the financial crisis and the country source for the data used to define the sector characteristics discussed below.2

Financial firms—such as banks and insurance companies—are also excluded from the analysis. Such restriction allows us to exploit certain characteristics of our

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1 For additional analyses using this dataset, see, for example, Ağca and Celasun (2012) and Medina (2012).
2 For our robustness check using panel data between 2008 and 2010, our preferred regression contains at least 30,366 observations.
### Table 1  
List of countries and industries used in the baseline empirical estimations  
*Source* Authors’ calculations  

| Sample type<sup>a</sup> | List of countries and industries used in the baseline empirical estimations |
|-------------------------|--------------------------------------------------------------------------------|
| **Countries** | Argentina, Australia*, Austria*, Belgium*, Canada*, Chile, China, Czech Republic*, Denmark*, Egypt, Finland*, France*, Germany*, Greece*, Hong, Hong*, Iceland*, India, Indonesia, Ireland*, Israel*, Italy*, Japan*, Jordan, Korea*, Lebanon, Luxembourg*, Malaysia, Mauritius, Mexico, Netherlands*, New Zealand*, Norway*, Philippines, Poland, Portugal*, Singapore*, Slovak Republic*, Slovenia*, South Africa, Spain*, Sweden*, Switzerland*, Thailand, Turkey, United Kingdom* |
| **Industry<sup>b</sup>** | **Mining**: metal mining (10), coal mining (12), oil and gas extraction (13); **Construction**: building construction-general contractors and operative builders (15), heavy construction other than building construction-Contractors (16), construction-special trade contractors (17); **Manufacturing**: food and kindred products (20), tobacco products (21), textile mill products (22), apparel and other finished products made from fabrics and similar materials (23), lumber and wood products, except furniture (24), furniture and fixtures (25), paper and allied products (26), printing, publishing, and allied industries (27), chemicals and allied products (28), petroleum refining and related industries (29), rubber and miscellaneous plastics products (30), leather and leather products (31), stone, clay, glass, and concrete products (32), primary metal industries (33), fabricated metal products, except machinery and transportation equipment (34), industrial and commercial machinery and computer equipment (35), electronic and other electrical equipment and components, except computer (36), transportation equipment (37), measuring, analyzing, and controlling instruments; photographic, medical and optical goods; watches and clocks (38), miscellaneous manufacturing industries (39); **Transportation, Communications, Electric, Gas, and Sanitary Services**: railroad transportation (40), motor freight transportation and warehousing (42), water transportation (43), transportation by air (45), pipelines, except natural gas (46), transportation services (47), communications (48), electric, gas, and sanitary services (49); **Wholesale Trade**: wholesale trade-durable goods (50), wholesale trade-nondurable goods (51); **Retail Trade**: building materials, hardware, garden supply, and mobile home dealers (52), general merchandise stores (53), food stores (54), apparel and accessory stores (55), home furniture, furnishings, and equipment stores (56), eating and drinking places (57), miscellaneous retail (58), miscellaneous retail (59); **Finance, Insurance, and Real Estate**: depository institutions (60), nondepository credit institutions (61), security and commodity brokers, dealers, exchanges, and services (62), insurance carriers (63), insurance agents, brokers, and service (64), real estate (65), holding and other investment offices (66); **Services**: hotels, rooming houses, camps, and other lodging places (70), business services (73), automotive repair, services, and parking (75), motion pictures (78), amusement and recreation services (79), health services (80), social services (83), engineering, accounting, research, management, and related services (87) |

<sup>a</sup>Asterisk (*) denotes countries classified as Advanced Economies by the IMF World Economic Outlook database  
<sup>b</sup>Industries categorized by SIC code as in the North American Industry Classification System (NAICS). In bold and italic sector divisions, and in parentheses the sector codes
sampled firms that may not be shared by financial firms. For example, leverage in financial firms is influenced by investor insurance schemes, which is generally not the case among manufacturing firms. Moreover, debt-like liabilities are not comparable between financial and non-financial firms. Finally, they are also excluded given one well-recognized aspect of the GFC that the true capital structure and scale of financial obligations of the financial firms were obscured by complex subsidiary structures, derivative positions, and securitization.

Fiscal data on spending and revenues come from the IMF World Economic Outlook (WEO) database. The discretionary fiscal impulse is measured as the negative 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 changes tied to the business cycle have been removed, leaving only changes tied to discretionary actions implemented by the government.3

To build the fiscal policy instrument used in our estimations—i.e., IMF World Economic Outlook’s (WEO’s) forecast errors of government expenditures—we follow Carrière-Swallow et al. (2021). We collect the reported fiscal expenditures for the years 2008 and 2009 reported in the October 2010 WEO. We assume those are “final” estimates.4 From those, we subtract projected fiscal expenditures as of the April WEO of the previous year.5 Since the spending projections are influenced by simultaneously estimated inflation projections, they are adjusted 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 for the spending projection of that year.) The nominal GDP denominators used were those reported in October 2010 since their role is to provide a scale to the stimulus and to address issues of endogeneity between fiscal policy and growth dynamics in previous years in the panel.

Other macroeconomic series, including nominal GDP, public revenue and spending, short-term interest rates between 2008 and 2010 are taken from the Spring 2014 World Economic Outlook database. Consumer price inflation and short-term interest rates are gathered from the IMF’s International Financial Statistics (IFS).6 The shadow interest rate used as robustness test is obtained from Wu and Xia (2016, 2017, 2020). For that variable, data could only be obtained for Austria, Finland, France, Germany, Italy, Luxembourg, Netherlands, Slovak Republic, Slovenia, and UK.

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3 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; Poplawski-Ribeiro 2009).

4 Subsequent revisions to fiscal accounts, nominal GDP, and inflation after October 2010 are likely based on methodological changes and thus would not be comparable to the forecasts produced before stimulus was enacted.

5 For a similar methodology, see also Lledó and Poplawski-Ribeiro (2013).

6 Identification of advanced and emerging economies is drawn from the IMF’s World Economic Outlook spring 2014 publication.
Measures of Business Cycle Sensitivity and External Financial Dependency

This section describes the industry-specific business cycle sensitivity index and the two types of industry-specific measures of dependence on external financing. As in Claessens et al. (2012), the business cycle sensitivity index is interacted with our fiscal stimulus measure in the baseline estimations, providing an industry-level dimension (or transmission channel) to the estimation of the impact of fiscal policy on the change in the firms’ ratio of sales and capital expenditures to total assets. The measures of dependence on external financing are, in turn, interacted with the short-term interest rate to provide a sectoral dimension of the monetary stimulus on firms’ performance in terms of sales and capital expenditure.

The business cycle sensitivity (BCS) of industry $j$ was initially proposed by Tong and Wei (2008). It is an index based on the stock price reactions of the firms in a particular industry to the September 11, 2001, terrorist attack. As those authors discuss, the September 11, 2001, shock can be argued to be large and unexpected. In the initial weeks after the shock, a big and downward shift in consumer confidence and expected future consumption demand was observed, leading to a downward adjustment in the forecast of subsequent US GDP growth by professional forecasters.

The BCS index is thus constructed as the log change in stock prices for each US-listed firm over the period September 10 to September 28, 2001. The mean of the log stock price change for each three-digit SIC industry provides the industry-level BCS. Airlines, defense, and insurance sectors, which were affected directly by the terrorist attack, are excluded from the analysis. Financial sector firms are also left out. The three-week window is chosen carefully. If the window would be shorter than one week, the index could have reflected a firm’s reaction to a perceived tightening of liquidity. If the window would be too long, the forecast for the US GDP growth could have been revised upward sufficiently that the index would not capture a firm’s reaction to a perceived economic downturn.

The approach assumes that sensitivity to business cycle is an intrinsic property of each industry, and therefore, the index derived from the pre-crisis data is applicable to firms in the same industry across all countries. However, at least two caveats are important to acknowledge. First, the use of BCS assumes that the index is constant over time and across economies, which is unlikely. Second, the index could be capturing a stronger sensitivity of a particular industry, such as IT, to the 2001 crisis rather than a sectoral sensitivity to the aggregate demand.

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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 Tong and Wei (2008) point out the consensus forecast for the year of 2001 Real GDP growth rate dropped from 1.6 percent to 1 percent, after the September 11 attack. Meanwhile, the consensus forecast for the year of 2002 dropped from 2.7 percent to 1.2 percent.

9 Given these caveats, some of our tests on “Robustness checks and additional tests” section check whether our results are robust to alternative ways on how the fiscal stimulus is included in our regression model.
The two indicators of external dependency, in turn, are chosen following Claessens et al.’s (2012) approach. The assumption is that firms more dependent on external financing were most likely more affected by the GFC. Hence, the monetary stimulus may have helped such firms more substantially.

Those indicators employ the 2000–2006 median for US’ firms, aggregated at the three-digit SIC level. Dependency on external finance for investment for a firm \( i \), on sector \( j \), located in the US, in a year \( t \) (\( EFDI_{i,j,US,t} \)), can be captured by 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:

\[
EFDI_{i,j,US,t} = \frac{\text{capital expenditure}_{i,j,US,t} - \text{cash flow}_{i,j,US,t}}{\text{capital expenditure}_{i,j,US,t}} \text{ for } 2000 \leq t \leq 2006.
\]  

Next, the indicator of intrinsic dependence on external finance for working capital (\( EFDW_{i,j,US,t} \)) captures the cash liquidity of firm \( i \)’s operations (in sector \( j \), located in the US for a year \( t \)) constrained by the size of its accounts receivables and the flexibility accorded by its accounts payables. Its construction follows Raddatz (2006) and employs the notion of “cash conversion cycle”:

\[
EFDW_{i,j,US,t} = 365 \times \left( \frac{\text{inventories}_{i,j,US,t} - \text{account payables}_{i,j,US,t}}{\text{cost of good sold}_{i,j,US,t}} + \frac{\text{account receivables}_{i,j,US,t}}{\text{total sales}_{i,j,US,t}} \right).
\]  

Descriptive Statistics

Although the data sample is restricted to publicly traded firms, there is nevertheless substantial heterogeneity across the sample firms in the responses of their sales and capital expenditures before and after the crisis.

Figure 2 displays the distributions and interquartile ranges of firms’ profitabilities between 2008 and 2010 for AEs and EMs. In turn, Appendix Tables 1, 2 and 3 in the online appendix (available in the authors’ website or upon request) report the principal descriptive statistics for the variables of interest at firm, country, and industry levels, presenting the results for all countries, AEs, and EMs.

For the full sample (Appendix Table 1 in ESM), the descriptive statistics show the average sales in percent of total assets in 2009 at approximately 86.7 percent among the sample of firms in our preferred estimation. Firms in advanced economies had higher sales ratios in 2009 than in emerging markets. As Fig. 2 also shows, they also experienced a lower increase in 2009 compared to those in emerging markets. In turn, capital expenditures in 2009 were approximately 4.4 percent of total assets among the sample of firms in our preferred estimation. Firms in advanced economies had a lower ratio of capital expenditure in 2009 than emerging markets. They also experienced a lower decline in that ratio compared to EMs in 2009 (see also Fig. 2). With respect to other indicators of initial financial health (2008), AEs
had lower short-term to total debt ratios at 51.7 percent than EMs at 60 percent. Average cash-to-assets ratios were higher for AEs at 14.2 percent versus 11.3 percent for EMs.

As Appendix Table 2 in ESM already convey, monetary stimulus is captured in this paper by a reduction in short-term interest rates (see also Laeven and Valencia, 2013). We choose the short-term interest rate instead of the policy rate as our stimulus measure because in many countries (particularly in AEs) monetary policy went...
beyond changes in policy rates through the adoption of Quantitative Easing (QE) or unconventional monetary policy. We thus believe that changes in the short-term interest rate reflect better the impacts of those other unconventional monetary policy tools than the policy rate only. As expected, the descriptive statistics in Appendix Table 2 in ESM highlight the lower short-term interest rates in 2009 for AEs as compared to EMs as well as a more substantial reduction in those rates for AEs between 2008 and 2009 vis-à-vis EMs.

Fig. 3 Fiscal impulse\(^1\), 2009–2010 (percent of potential GDP). Source: IMF, World Economic Outlook database; and authors’ calculations.\(^4\) Change in structural fiscal balance between 2009 and 2008 times -1.

Concerning the fiscal impulse, Fig. 3 and Appendix Table 2 in ESM present estimates of the change in structural fiscal balance between 2008 and 2009. That impulse ranged from an expansionary change in the structural fiscal balance of around 6 percentage points of potential GDP in Singapore to a contractionary change of close to -2 percent of potential GDP in Egypt. The median change in the deficit is roughly 1.82 percentage points of potential GDP. The change in government expenditure in 2009 is also positive and around 2.65 percentage points of GDP for the economies in our sample (Appendix Table 2 in ESM).

\(^{10}\) In “Robustness checks and additional tests” section, we use shadow interest rates (see Wu and Xia 2016, 2017, 2020) instead of short-term interest rates to test for the robustness of our results when adopting a different measure of monetary stimulus. Appendix Table 2 in ESM also presents descriptive statistics for that variable.
Estimation Strategy

Our estimation strategy follows Claessens et al. (2012) and Correa-Caro et al. (2018). It interacts the fiscal impulse with Tong and Wei’s (2008) measure of business cycle sensitivity. The monetary policy proxy is further interacted with the industry-level indicators presented in Eqs. (1) and (2), which capture firms’ potential sectoral sensitivity to international trade and external financing conditions.

The following equation specifies our analysis of the impact of policies stimuli at the firm-level ratio of sales or capital expenditures to total assets:

\[
\Delta Y_{i,j,k,2009} = \rho \Delta FP_{k,2009} + \gamma BCS_j \times \Delta FP_{k,2009} + \theta BCS_j + \delta \Delta MP_{k,2009} + \varphi \text{EFDI}_j \\
+ \delta \text{EFDI}_j \times \Delta MP_{k,2009} + \mu \text{EFDW}_j + \sigma \text{EFDW}_j \times \Delta MP_{k,2009} \\
+ \beta' \text{Controls}_{i,j,k,2008-2009} + \alpha_j + \epsilon_{i,j,k,2009}
\]  

(3)

where the dependent variable \(\Delta Y_{i,j,k,2009}\) denotes the change sales (\(\Delta Sales_{i,j,k,2009}\)), or capital expenditures (\(\Delta \text{Capex}_{i,j,k,2009}\)), in percent of total assets from 2008 to 2009 for firm \(i\), in sector \(j\), in country \(k\) of a particular region (ALL countries, AEs or EMs); \(\Delta FP_{k,2009}\) represents our fiscal impulse measure; \(BCS_j\) stands for the industry-level business cycle sensitivity; \(\Delta MP_{k,2009}\) denotes our monetary stimulus measure, again captured by an annual reduction in short-term interest rates; \(\text{EFDI}_j\) is the average between 2000 and 2006 of the industry-level intrinsic dependence on external finance for investment, calculated by Eq. (1); \(\text{EFDW}_j\) is the average between 2000 and 2006 of the industry-level intrinsic dependence on external finance for working capital, calculated by Eq. (2); \(\text{Controls}_{i,j,k,2008}\) is a matrix containing initial level (2008) firms’ characteristics; \(\alpha_j\) represents sector fixed effects (via 3-digit SIC industry-level dummies); and \(\epsilon_{i,j,k,2009}\) is the error term.

Given that some of the variables in Eq. (3) are instrumented in order to avoid endogeneity issues, the two-stage least square (2SLS) estimator is used. We then apply and report the Wald (Chi-squared) test, checking for weak instruments. Standard errors are clustered at SIC-3 industry-level.11

The term \(BCS_j \times \Delta FP_{k,2009}\) in Eq. (3) interacts the constant (over time) business cycle sensitivity measure for the industry \(j\) with the fiscal impulse \(\Delta FP_{k,2009}\) of country \(k\) between 2008 and 2009. Notice that Eq. (3) also includes the terms of the interaction term separately. So, the coefficient of that interaction, \(\gamma\), estimates the marginal effect for firms of the fiscal stimulus through their sectoral sensitivity to the business cycle. Hence, in order to obtain the full effect of the stimulus on firms’ sales and capital expenditure, one has to combine both coefficients (\(\rho + \gamma\)) estimated by (3).

Beyond its interaction with \(BCS_j\), the fiscal impulse is again here instrumented by the IMF World Economic Outlook’s (WEO’s) forecast errors of government expenditures in 2009. In the same spirit as in Carrière-Swallow et al. (2021) and Born et al. (2020), the objective of using spending forecast errors as an instrument for the

11 Results are further checked with robust standard errors. Both methodologies provide similar results.
fiscal stimulus is to address potential endogeneity issues, such as reverse causality, between the discretionary impulse and firms’ performance in terms of sales and capital expenditures. As discussed in “Corporate and Macroeconomic Data” section, to construct that instrument, we record the forecasts in the fall of the prior year (2008). This way, the ex post errors may be interpreted as a proxy for discretionary fiscal policy, with forecast errors being correlated to the fiscal stimulus provided at the same time that their formation process is independent of the realized firms’ sales or capital expenditures.12

The change in short-term interest rates ($\Delta MP_{k,2009}$) is further instrumented here by its first lag ($\Delta MP_{k,2008}$) to mitigate potential endogeneity effects of that variable in the regressions. Moreover, the other two multiplicative terms in (3), $EFDI_j \times \Delta MP_{k,2009}$ and $EFDW_j \times \Delta MP_{k,2009}$, interact our monetary stimulus proxy with the two constant (over time) measures of external financial dependency: $EFDI_j$ and $EFDW_j$. We use those two interactions to investigate the transmission channels of monetary stimulus through the firms’ dependency on external financing. The hypothesis is that firms in industries that are more dependent on external financing would be more sensitive to changes in monetary policy. Overall, we expect that a loosening of monetary policy (a negative change in policy rates) should support higher firms’ sales and capital expenditures by stimulating aggregate demand and reducing interest expense. The expected signs of the impact of the monetary stimulus in Specification (3) after combining the effects of the monetary policy measure by itself with the marginal effects obtained from each of the interaction terms, $(\delta + \theta)$ or $(\delta + \sigma)$, should remain negative.

The matrix of firms characteristics (initial conditions), $Controls_{i,j,k,2008-2009}$ contains the following variables reported in the firms’ financial statements: (i) the change in the other performance variable that is not the dependent variable, i.e., either $\Delta Capex_{i,j,k,2009}$ or $\Delta Sales_{i,j,k,2009}$) instrumented by its first lag; (ii) size of the firm ($Size_{i,j,k,2008}$), measured by total value of assets in US dollars; (iii) indebtedness ($Leverage_{i,j,k,2008}$), measured by the percentage ratio of total liabilities to total assets; (i) Short-term debt ($Short-term debt_{i,j,k,2008}$, i.e., the ratio of a firm debt payable within one year to total debt; and (v) the cash-to-assets ratio ($Balance sheet liquidity_{i,j,k,2008}$).

For each of the variable $\Delta Y_{i,j,k,2009}$ (sales or capital expenditures), we use the contemporaneous value of the other variable ($\Delta Capex_{i,j,k,2009}$ or $\Delta Sales_{i,j,k,2009}$), instrumented by its first lag as a firm characteristic in the regression. First lags are used as instruments to avoid reverse causality and other endogeneity issues in the estimation of Eq. (3). As an additional outlier treatment from the fiscal side, the regressions also trim the data for those countries in which the fiscal forecast errors were above the top or below the bottom 5th percentile of the total distribution of that variable. That eliminates excessive fiscal (positive and negative) surprises that may be related

12 The approach has caveats, though. First, forecasts themselves may be of low quality, potentially suffering from bias, inefficiency, and inaccuracy, which may affect the forecast errors and their correlation with the realized discretionary fiscal policy. Second, the interpretation of forecast errors as fiscal actions is not fool proof as those errors may reflect other factors, such as relative price changes or data revisions.
to *de facto* forecast errors rather than an unexpected fiscal shock coming from a policy decision.

_Firm size_ is controlled for 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 could promote higher sales and capital expenditures and so a positive correlation is expected for both variables.

_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 to fund new investment that boost sales and capital expenditures through new ventures.

_Balance sheet liquidity_ is further included in Eq. (1), given that the use of liquid assets to support working capital or pledging it as collateral both, contribute to lower interest expense and perhaps is positively correlated with changes in capital expenditures (and even sales). Finally, _short-term borrowing_ (or short-term debt) generally carries lower interest charges, suggesting a positive correlation with changes in capital expenditures.

**Results**

This section reports the main results of using the baseline specification described in Eq. (3). Our result tables display the estimation outcomes with the full sample, followed by samples using AEs and EMs only. The section also reports the effects of the fiscal stimulus per industry group and by selected geographic regions.

**Baseline Estimation**

Tables 2 and 3 show the effects of fiscal and monetary stimuli on changes in the sales and CAPEX ratios to total assets in 2009, respectively. All columns include the fiscal and monetary stimulus measures and their interaction terms with the industry-level variables described above: (i) the fiscal impulse is interacted with the business cycle sensitivity and (ii) the change in short-term interest rates is interacted either with dependency on external finance for working capital or dependency on investment.

Tables 2 and 3 report on their top rows the coefficient and Z-statistic of the linear combination of the coefficients of the stimulus variables (fiscal and monetary) estimated on its own and interacted with the industry-level variables. Accordingly, they display the full effects of each of the policy instruments through the transmission channels chosen. The tables also report in the bottom rows the number of observations, number of countries and of industry clusters as well as the adjusted R-squared

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13 Joseph et al. (2019) claim, for example, that balance sheet liquidity was key for firms to withstand financial crisis.
## Table 2  Baseline estimation results for the change in sales, 2009

*Sources:* Refinitiv Worldscope; IMF, World Economic Outlook database; and authors’ estimations

| Variables                                                                 | (1)   | (2)      | (3)   | (4)   | (5)   | (6)   | (7)      | (8)   | (9)   |
|---------------------------------------------------------------------------|-------|----------|-------|-------|-------|-------|----------|-------|-------|
| **Combined effects**                                                      |       |          |       |       |       |       |          |       |       |
| Fiscal impulse (A) + (B)                                                  | 0.720*** | 0.730*** | 0.728*** | 0.741*** | 0.725*** | 0.737*** | 0.778*** | 0.930*** | −0.686* |
|                                                                          | (5.526) | (5.560)  | (5.169) | (5.619) | (5.232) | (5.570) | (5.605)  | (5.481) | (−1.843) |
| Monetary impulse via working capital dependency (C) + (D)                 | −0.112 | −0.112   | −0.125 | −0.113 | 0.020  | −0.092 | 0.052    | 0.117  | −0.008 |
|                                                                          | (−0.907) | (−0.901) | (−0.894) | (−0.912) | (0.147) | (−0.729) | (0.384)  | (0.687) | (0.022) |
| Monetary impulse via investment capital dependency (C) + (E)             | −0.094 | −0.099   | −0.085 | −0.101 | 0.056  | −0.052 | 0.118    | 0.189  | 0.033  |
|                                                                          | (−0.723) | (−0.751) | (−0.578) | (0.767) | (0.391) | (−0.379) | (0.814)  | (1.029) | (0.088) |
| **Regression results**                                                   |       |          |       |       |       |       |          |       |       |
| Fiscal impulse (A)                                                        | 0.499** | 0.512**  | 0.474* | 0.523** | 0.460* | 0.521** | 0.517**  | 0.590** | −1.300 |
|                                                                          | (2.232) | (2.248)  | (1.876) | (2.292) | (1.852) | (2.261) | (2.083)  | (2.060) | (−1.510) |
| Fiscal impulse * business cycle sensitivity (B)                           | 1.961 | 1.940    | 2.168 | 1.939 | 2.266  | 0.902  | 2.228    | 2.904  | 5.253  |
|                                                                          | (1.275) | (1.245)  | (1.265) | (1.243) | (1.342) | (1.219) | (1.323)  | (1.505) | (1.004) |
| Change in short term interest rate (C)                                    | −0.105 | −0.109   | −0.100 | −0.111 | 0.044  | −0.072 | 0.095    | 0.166  | 0.017  |
|                                                                          | (−0.828) | (−0.848) | (−0.698) | (−0.865) | (0.314) | (−0.541) | (0.671)  | (0.935) | (0.046) |
| Change in short term interest rate * working capital dependency (D)      | −0.024 | −0.011   | −0.090 | −0.006 | −0.086 | −0.069 | −0.149   | −0.171 | −0.083 |
|                                                                          | (−0.311) | (−0.135) | (−0.960) | (−0.071) | (−0.939) | (−0.708) | (−1.441) | (−1.319) | (−0.390) |
| Change in short term interest rate * investment capital dependency (E)   | 0.048 | 0.042    | 0.066 | 0.040 | 0.053  | 0.084  | 0.102    | 0.094  | 0.092  |
|                                                                          | (0.871) | (0.775)  | (1.082) | (0.737) | (0.852) | (1.383) | (1.531)  | (1.087) | (0.655) |
| Change in sales (percent of assets)                                       | 0.014*** | 0.010    | 0.015*** | 0.021 | 0.014*** | 0.024 | 0.016    | 0.536*** | (2.836) |
|                                                                          | (2.914) | (2.914)  | (1.161) | (2.834) | (1.222) | (1.149) | (3.170)  |          |        |
Table 2 (continued)

| Variables                                      | (1) (ALL) | (2) (ALL) | (3) (ALL) | (4) (ALL) | (5) (ALL) | (6) (ALL) | (7) (ALL) | (8) (AEs) | (9) (EMs) |
|------------------------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Leverage: total debt in $t−1$ (log, thousand USD) | 0.142***  | −0.319*** | −0.369*** | −0.369    | (2.104)   | (2.705)   | (2.698)   | (1.628)   |           |
| Size: total assets in $t−1$ (log, thousand USD)  | −0.104    | 0.595***  | 0.555***  | −0.677**  | (−1.395)  | (−4.105)  | (3.377)   | (−2.178)  |           |
| Short-term debt in $t−1$ (percent of total debt) | 0.038***  | 0.038***  | 0.026***  | 0.051***  | (−8.142)  | (−7.488)  | (−4.988)  | (−5.288)  |           |
| Balance sheet liquidity: cash in $t−1$ (percent of assets) | −0.008    | −0.028**  | −0.006    | −0.095*** | (−1.099)  | (−2.247)  | (−0.395)  | (−3.556)  |           |
| Observations                                    | 22,182    | 21,513    | 17,643    | 21,511    | 17,417    | 21,237    | 17,253    | 11,292    | 5,961     |
| Adjusted R-squared                              | 0.01      | 0.01      | 0.01      | 0.01      | 0.01      | 0.02      | 0.02      | ...       |           |
| Wald (Chi-squared) test                         | 126.8***  | 131.8***  | 110.9***  | 141.4***  | 170.9***  | 130.8***  | 209.3***  | 132.7***  | 103.6***  |
| Number of countries                             | 45        | 45        | 45        | 45        | 45        | 45        | 45        | 29        | 16        |
| Number of clusters                              | 3,930     | 3,853     | 3,677     | 3,853     | 3,663     | 3,783     | 3,606     | 2,336     | 1,270     |

Notes: Robust t-statistics in parentheses estimated using clustered standard errors at three-digit sector level. Significance at ***p < 0.01; **p < 0.05; *p < 0.10. ALL = all countries in the sample; AEs = advanced economies; EMs = emerging markets

aLinear combination of the impulse variable coefficients indicated in each row and its interaction term with the respective sectoral variable evaluated at the median of the sectoral variable for the sample used in the regression

bAll estimations use the two-stage least squares (2SLS) estimators and include sector-level dummies (not reported in the table)

cFiscal impulse is defined as the negative of the change in structural public balances

dFiscal impulse variable instrumented by unexpected government spending measured by IMF staff forecast errors (a negative value indicates a tighter fiscal position) and lagged values of the change in short-term interest rates and changes in the sales to asset ratio
### Table 3  Baseline estimation results for the change in capital expenditures, 2009 Sources: Refinitiv Worldscope; IMF, World Economic Outlook database; and authors’ estimations

| Variables                                                                 | (1)      | (2)      | (3)      | (4)      | (5)      | (6)      | (7)      | (8)      | (9)      |
|----------------------------------------------------------------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
|                                                                            | ALL      | ALL      | ALL      | ALL      | ALL      | ALL      | ALL      | AEs      | EMs      |
| **Combined effects**<sup>a</sup>                                           |          |          |          |          |          |          |          |          |          |
| Fiscal impulse (A) + (B)                                                   | 0.112*** | 0.114*** | 0.115*** | 0.111*** | 0.109*** | 0.103*** | 0.091*** | 0.062*   | −0.101   |
|                                                                            | (3.755)  | (3.759)  | (3.860)  | (3.706)  | (3.685)  | (3.362)  | (3.127)  | (1.732)  | (−1.273) |
| Monetary impulse via working capital dependency (C) + (D)                   | 0.042    | 0.040    | 0.045    | 0.040    | 0.031    | 0.038    | 0.029    | 0.099*** | −0.090   |
|                                                                            | (1.499)  | (1.429)  | (1.651)  | (1.433)  | (1.095)  | (1.327)  | (1.039)  | (2.679)  | (−1.363) |
| Monetary impulse via investment capital dependency (C) + (E)               | 0.049*   | 0.047*   | 0.049*   | 0.047*   | 0.038    | 0.046    | 0.038    | 0.121*** | −0.097   |
|                                                                            | (1.722)  | (1.655)  | (1.746)  | (1.658)  | (1.308)  | (1.552)  | (1.301)  | (3.167)  | (−1.450) |
| **Regression results**<sup>b</sup>                                         |          |          |          |          |          |          |          |          |          |
| Fiscal Impulse (A)                                                        | 0.132*   | 0.135*   | 0.125**  | 0.133*   | 0.131**  | 0.125    | 0.116**  | 0.077    | 0.046    |
|                                                                            | (1.886)  | (1.898)  | (2.187)  | (1.921)  | (2.342)  | (1.609)  | (2.055)  | (1.225)  | (0.276)  |
| Fiscal impulse * business cycle sensitivity (B)                            | −0.177   | −0.185   | −0.081   | −0.191   | −0.183   | −0.192   | −0.217   | −0.133   | −1.268   |
|                                                                            | (−0.384) | (−0.401) | (−0.220) | (−0.422) | (−0.506) | (−0.381) | (−0.592) | (−0.336) | (−1.180) |
| Change in short term interest rate (C)                                     | 0.044    | 0.042    | 0.046*   | 0.043    | 0.034    | 0.041    | 0.034    | 0.115*** | −0.097   |
|                                                                            | (1.580)  | (1.515)  | (1.662)  | (1.522)  | (1.197)  | (1.426)  | (1.197)  | (3.053)  | (−1.457) |
| Change in short term interest rate * working capital dependency (D)        | −0.009   | −0.009   | −0.005   | −0.011   | −0.011   | −0.013   | −0.019   | −0.054*** | 0.073**  |
|                                                                            | (−0.520) | (−0.537) | (−0.350) | (−0.647) | (−0.683) | (−0.704) | (−1.165) | (−2.753) | (2.024)  |
| Change in short term interest rate * investment capital dependency (E)     | 0.019*   | 0.019*   | 0.012    | 0.020**  | 0.014    | 0.020*   | 0.015    | 0.026*   | −0.000   |
|                                                                            | (1.920)  | (1.914)  | (1.248)  | (1.966)  | (1.437)  | (1.914)  | (1.495)  | (1.936)  | (−0.012) |
| Change in sales (percent of assets)<sup>d</sup>                            | −0.000   | −0.001   | −0.001   | −0.001   | −0.001   | −0.001   | 0.003    | (−0.875) | (−1.008) |
|                                                                            | (−1.034) | (−0.917) | (−0.934) | (−1.011) | (−1.216) | (0.744)  |          |          |          |
Table 3 (continued)

| Variables                                         | (1)          | (2)          | (3)          | (4)          | (5)          | (6)          | (7)          | (8)          | (9)          |
|---------------------------------------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
|                                                   | ALL          | ALL          | ALL          | ALL          | ALL          | ALL          | ALL          | AEs          | EMs          |
| Leverage: total debt in t−1 (log, thousand USD)   | − 0.055***   | − 0.141***   | − 0.147***   | − 0.082*     |              |              |              |              |              |
|                                                   | (− 3.757)    | (− 5.530)    | (− 4.550)    | (− 1.847)    |              |              |              |              |              |
| Size: total assets in t−1 (log, thousand USD)     | 0.031        | 0.208***     | 0.255***     | − 0.013      |              |              |              |              |              |
|                                                   | (1.503)      | (6.717)      | (6.927)      | (− 0.211)    |              |              |              |              |              |
| Short− term debt in t−1 (percent of total debt)   | 0.006***     | 0.005***     | 0.005***     | 0.007***     |              |              |              |              |              |
|                                                   | (4.792)      | (4.188)      | (3.684)      | (3.125)      |              |              |              |              |              |
| Balance sheet liquidity: cash in t−1 (percent of assets) |              |              |              |              |              |              | 0.019***     | 0.020***     | 0.019***     |
|                                                   |              |              |              |              |              |              | (0.019)      | (0.020)      | (0.019)      |
|                                                   |              |              |              |              |              |              | (0.019)      | (0.020)      | (0.019)      |
|                                                   |              |              |              |              |              |              | (13.429)     | (8.770)      | (6.508)      |
|                                                   |              |              |              |              |              |              | (6.279)      |              |              |
| Observations                                      | 21,409       | 21,367       | 17,744       | 21,364       | 17,529       | 21,081       | 17,359       | 11,377       | 5,982        |
| Adjusted R-squared                               | 0.00         | 0.00         | 0.00         | 0.00         | 0.00         | 0.01         | 0.01         | 0.01         | 0.01         |
| Wald (Chi-squared) test                          | 28.8***      | 29.0***      | 43.8***      | 30.1***      | 58.8***      | 229.3***     | 207.4***     | 194.6***     | 86.4***      |
| Number of countries                              | 45           | 45           | 45           | 45           | 45           | 45           | 45           | 29           | 16           |
| Number of clusters                               | 3,892        | 3,888        | 3,720        | 3,888        | 3,706        | 3,815        | 3,646        | 2,367        | 1,279        |

Notes: Robust t-statistics in parentheses estimated using clustered standard errors at three-digit sector level. Significance at ***p < 0.01; **p < 0.05; *p < 0.10. ALL = all countries in the sample; AEs = advanced economies; EMs = emerging markets

a Linear combination of the impulse variable coefficients indicated in each row and its interaction term with the respective sectoral variable evaluated at the median of the sectoral variable for the sample used in the regression

b All estimations use the two-stage least squares (2SLS) estimators and include sector-level dummies (not reported in the table)

c Fiscal impulse is defined as the negative of the change in structural public balances

d Fiscal impulse variable instrumented by unexpected government spending measured by IMF staff forecast errors (a negative value indicates a tighter fiscal position) and lagged values of the change in short-term interest rates and changes in the sales to asset ratio
and the Cragg–Donald Chi-square statistic of weak instruments, checking the relevance of the instruments employed in the regressions.

The statistically significant positive sign on the fiscal impulse measure (first line of Tables 2, 3) for the full and advance economies samples (but not to emerging markets) indicates that, ceteris paribus, a move toward larger structural deficits is associated with a positive increase in the corporate ratios of sales and capex to total assets in 2009. This is true for all specifications, including for our baseline specification with all controls jointly included in Column (7).

For Table 2, the coefficient value (0.778) in Column 7 suggests that for the average business cycle (equal to 0.11), an increase of 1.8 percentage points of potential GDP in the fiscal impulse (the average fiscal impulse increase in our sample, see Appendix Table 2 in ESM) was associated with an augmentation in sales in 2009 of 1.4 percentage points of the average firm total assets. Such value is located in the third quartile of the change-in-sales distribution for 2009 and well above of the mean and median, which were negative. Table 2 also evinces a positive and significant association between the fiscal impulse and the change in sales in 2009 for AEs (Column 8), but a marginally significantly negative association for EMs (Column 9).

For capex, Table 3 displays a coefficient value of 0.091 in Column 7. This suggests that for the average business cycle (equal to 0.11), the increase of 1.8 percentage points of potential GDP in the fiscal impulse was associated with a hike in capex in 2009 of 0.16 percentage points of the average firm total assets. That value is also located in the third quartile of the change-in-capex distribution for 2009 and above of the negatives mean and median. For capex, the coefficient for AEs in Table 3 is only marginally significant and positive for AEs (Column 8) and non-significant for EMs (Column 9).

Regarding the monetary stimulus, the baseline estimations (Column 7) for the change in the ratios of sales and capex to total assets (Tables 2, 3) show a statistically nonsignificant effect of a reduction in the short-term interest rate in those dependent variables. Hence, differently from the results for fiscal impulse, the monetary stimulus in 2009 seems to have played a reduced role in boosting firm sales and capex in our sample. That is also the case for AEs and EMs in the case of the change in sales (Columns 8 and 9 of Table 2, respectively). For capex, the monetary stimulus is statistically significant, but with the wrong sign for AEs, as shown in Table 3, Column 8. There, a decline in short-term interest rates is associated with a decline in capex.

The initial firm-level controls are, in turn, found to be significant in explaining the change in firm sales and capex in 2009. Surprisingly each of these controls has a significant but opposite sign for the estimation of the change in the ratios of sales and capex to total assets. For example, a large initial indebtedness is statistically significant and positive for sales, but negative for capex. In Table 2, the interpretation is that a higher leverage could be associated with a larger increase in sales, most likely through the financing that that higher leverage provides. In Table 3, the sign is the opposite. A larger leverage is associated with a decline in capex. Most likely, that is due to the precaution taken by the average firm when it is so leveraged.

Firm size, short-term debt and balance sheet liquidity are further negatively associated with a change in sales (Table 2), while they are positively associated with a
change in CAPEX in Table 3. The difference in those signs on the sales’ and capex’ estimations highlights the ambiguity of the impact of those firms’ initial conditions depending on the performance variable investigated. The negative effects of holding cash and having more short-term debt in the sales’ estimations suggest that these firms were already not financially sound and facing cashflow issues even before the crisis. They may have been hit harder hit by the GFC. At the same time, the estimated positive sign in the case of the capex estimation may indicate the propensity of the sample of firms in that estimation to invest once the crisis hit.

**Industrial Differentiation**

The fiscal stimulus may have been more important for some industries during the GFC while less relevant for others. Such information could be used by policy makers, for instance, to better target fiscal resources toward more responsive sectors in periods of crisis.\(^{14}\)

Currently under the COVID-19 pandemic, this is, in fact, a crucial question. If policy makers could understand countercyclical effects of stimuli in terms of at least industry-level profitability and of their impact in sales and capex, they would be able to better target that impulse to industries with the largest bang for the buck—for instance, those with more contact intensity such as services, retail, and transportation (see Leibovici et al., 2020). That could make the stimulus policy more effective and avoid inefficiencies in a moment in which public debt levels are high (see also Igan et al., forthcoming).

To that end, we apply Eq. (3) to different subsamples of firms comprising distinct industries. In this exercise, each industry category includes many subsectors to retain meaningful variation in sector-specific sensitives. Tables 4, 5, 6 and 7 display the results.

Containing almost 50 percent of the sampled firms, we find that the coefficient of the fiscal impulse in 2009 interacted with the business cycle sensitivity is positive and highly statistically significant for the manufacturing industry. As Table 4 indicates, a one-percent increase in the structural deficit (fiscal impulse) in the manufacturing sector is associated with an increase of 0.59 percentage points of total assets in firms’ sales in 2009 (after interacting it with the average business cycle sensitivity indicator for the full sample). Such value is above the (negative) median change in the ratio of sales to total assets between 2008 and 2009. It suggests a meaningful economic impact of the stimulus for that industry. For this manufacturing sector, the significant positive effect of the fiscal stimulus seems to come from AEs, which has also a significantly higher value of the coefficient. For EMs, the coefficient has, in turn, a statistically significant negative sign, which is the opposite of what we obtained for our baseline and other analyses.

\(^{14}\) Ramey and Shapiro (1998) show that a big share of government spending is prevalent on a subset of industries and, so, it would be relevant to understand its effect on the change in sales and capex of those industries.
Table 4  Horse race results for the change in sales per industry, 2009  
Sources: Refinitiv Worldscope; IMF, World Economic Outlook database; and authors’ estimations

| Variables | Manufacturing | Construction | Transportation | Wholesale |
|-----------|---------------|--------------|----------------|-----------|
|           | ALL | AEs  | EMs  | ALL | AEs  | EMs  | ALL | AEs  | EMs  | ALL | AEs  | EMs  |
| Combined effects<sup>a</sup> |       |       |       |       |       |       |       |       |       |       |       |       |
| Fiscal impulse (A) + (B) | 0.589*** | 0.984*** | − 1.955*** | 0.926** | 1.055** | 3.003* | 0.785 | 1.012 | − 1.014 | 1.361* | 0.179 | 0.695 |
| Monetary impulse via working capital dependency (C) + (D) | (2.950) | (3.838) | (− 3.770) | (2.063) | (1.974) | (1.659) | (1.164) | (1.338) | (− 0.534) | (1.871) | (0.200) | (0.254) |
| Monetary impulse via investment capital dependency (C) + (E) | 0.171 | 0.125 | − 0.160 | 0.926** | 1.055** | 3.003* | 0.785 | 1.012 | − 1.014 | 1.361* | 0.179 | 0.695 |
| Regression results<sup>b</sup> |       |       |       |       |       |       |       |       |       |       |       |       |
| Fiscal Impulse<sup>c</sup> (A) | 0.776* | 1.098** | − 2.088 | 0.437 | 1.344 | 6.862 | 0.257 | 0.176 | − 1.292 | 0.621 | − 0.646 | 5.645 |
| Fiscal impulse * business cycle sensitivity (B) | (1.752) | (2.074) | (− 1.211) | (0.328) | (0.947) | (1.151) | (0.285) | (0.184) | (− 0.370) | (0.564) | (− 0.498) | (1.079) |
| Change in short term interest rate<sup>d</sup> (C) | − 1.659 | − 1.011 | 1.184 | 2.052 | − 1.213 | − 24.830 | 3.022 | 4.793 | 1.592 | 7.162 | 7.983 | − 51.622 |
| Change in short term interest rate * working capital dependency (D) | (− 0.514) | (− 0.261) | (0.091) | (0.334) | (− 0.165) | (− 0.883) | (0.729) | (1.001) | (0.102) | (0.728) | (0.689) | (− 1.212) |
| Change in short term interest rate * investment capital dependency (E) | 0.173 | 0.138 | − 0.162 | 1.783 | 0.793 | 12.587* | 1.436 | 1.445 | 5.066 | 1.146 | 4.606*** | − 3.882 |
| Change in capital expenditures (percent of assets)<sup>e</sup> | (0.753) | (0.447) | (− 0.275) | (0.796) | (0.274) | (1.947) | (1.380) | (1.308) | (1.544) | (1.355) | (3.038) | (− 1.559) |
| Leverage: total debt in t−1 (log, thousand USD) | 0.931*** | 1.132*** | 0.584*** | (− 0.209) | 0.242 | − 0.597 | 0.096 | 0.007 | − 0.372 | − 0.124 | 0.184 | − 0.733 |
| Size: total assets in t−1 (log, thousand USD) | (6.752) | (5.780) | (3.494) | (− 0.553) | (0.409) | (− 1.258) | (− 0.529) | (0.035) | (− 0.912) | (− 0.277) | (0.495) | (− 1.050) |

Notes:
<sup>a</sup> Standard errors in parentheses.
<sup>b</sup> Standard errors in parentheses.
<sup>c</sup> Fiscal impulse is measured as a change in the fiscal impulse indicator.
<sup>d</sup> Change in short term interest rate is measured as a change in the short term interest rate
<sup>e</sup> Change in capital expenditures is measured as a change in the capital expenditures indicator.
Table 4 (continued)

| Variables                                           | Manufacturing | Construction | Transportation | Wholesale |
|-----------------------------------------------------|---------------|--------------|----------------|-----------|
|                                                     | ALL           | AEs          | EMs            | ALL       | AEs         | EMs            | ALL       | AEs         | EMs            |
| Short− term debt in t−1 (percent of total debt)     | −0.051***     | −0.034***    | −0.048***      | 0.008     | 0.014       | −0.031         | −0.088*** | −0.112***  | −0.047         | −0.014     | −0.005       | 0.044         |
|                                                     | (−5.882)      | (−3.072)     | (−3.538)       | (−0.326)  | (0.490)     | (−0.837)       | (−2.171)  | (−2.241)   | (−0.687)       | (−0.515)  | (−0.145)     | (0.676)       |
| Balance sheet liquidity: cash in t−1 (percent of assets) | −0.048**     | 0.005        | −0.097**       | 0.032     | 0.106       | −0.051         | −0.265**  | −0.185      | −0.474**       | −0.118     | −0.117       | −0.117        |
|                                                     | (−2.082)      | (−0.186)     | (−2.361)       | (0.441)   | (1.294)     | (−0.358)       | (−2.445)  | (−1.470)   | (−2.405)       | (−1.561)  | (−1.402)     | (−0.776)      |
| Observations                                        | 8,337         | 4,963        | 3,374          | 821       | 439         | 382            | 422       | 298        | 124            | 868       | 628          | 240           |
| Wald (Chi-squared) test                             | 250.2***      | 185.1***     | 100.2***       | 22.1***   | 18.9***     | 21.7***        | 24.3***   | 16.8***    | 29.3***        | 24.9***   | 31.7***      | 35.7***       |
| Number of countries                                 | 45            | 29           | 16             | 38        | 24          | 14             | 42        | 27         | 15             | 38        | 25           | 13            |
| Number of clusters                                  | 1,887         | 1,211        | 676            | 110       | 65          | 45             | 153       | 100        | 53             | 279       | 187          | 92            |

Notes: Robust t-statistics in parentheses estimated using clustered standard errors at three-digit sector level. Significance at ***p < 0.01; **p < 0.05; *p < 0.10. ALL = all countries in the sample; AEs = advanced economies; EMs = emerging markets.

a Linear combination of the impulse variable coefficients indicated in each row and its interaction term with the respective sectoral variable evaluated at the median of the sectoral variable for the sample used in the regression.
b All estimations use the two-stage least squares (2SLS) estimators and include sector-level dummies (not reported in the table).
c Fiscal impulse is defined as the negative of the change in structural public balances.
d Fiscal impulse variable instrumented by unexpected government spending measured by IMF staff forecast errors (a negative value indicates a tighter fiscal position) and lagged values of the change in short-term interest rates and changes in the capital expenditure to asset ratio.
Table 5 Horse race results for the change in sales per industry (concluded), 2009. Sources Refinitiv Worldscope; IMF, World Economic Outlook database; and authors’ estimations

| Variables | Utilities | Retail | Services |
|-----------|----------|--------|----------|
|           | ALL AEs | EMs    | ALL AEs | EMs    | ALL AEs | EMs    |
| Combined effects<sup>a</sup> |         |        |         |        |         |        |
| Fiscal impulse (A) + (B) | 0.188 | 0.687 | −0.487 | 0.006 | −0.584 | 0.691 | 0.795** | 0.649 | 0.680 |
| | (0.347) | (1.093) | (−0.440) | (0.009) | (−0.959) | (0.185) | (2.313) | (1.540) | (0.817) |
| Monetary impulse via working capital dependency (C) + (D) | 0.347 | 0.118 | 1.725 | 0.006 | −0.584 | 0.691 | 0.795** | 0.649 | 0.680 |
| | (0.867) | (0.171) | (1.505) | (−2.110) | (−1.240) | (0.139) | (−0.050) | (0.686) | (−0.429) |
| Monetary impulse via investment capital dependency (C) + (E) | 0.375 | 0.101 | −0.316 | 0.006 | −0.584 | 0.691 | 0.795** | 0.649 | 0.680 |
| | (0.980) | (0.145) | (−0.270) | (−0.120) | (0.265) | (−0.070) | (0.590) | (0.694) | (0.977) |
| Regression results<sup>b</sup> |         |        |         |        |         |        |
| Fiscal Impulse<sup>c</sup> (A) | −0.899 | 0.046 | −1.915 | −2.095 | −3.290 | −1.655 | −0.121 | −0.065 | −0.063 |
| | (−0.736) | (0.027) | (−0.857) | (−1.085) | (−1.292) | (−0.117) | (−0.185) | (−0.086) | (−0.033) |
| Fiscal impulse * business cycle sensitivity (B) | 13.520 | 6.847 | 17.750 | 21.820 | 28.100 | 24.365 | 5.283 | 4.116 | 4.291 |
| | (1.371) | (0.504) | (1.131) | (1.310) | (1.198) | (0.221) | (1.490) | (1.004) | (0.555) |
| Change in short term interest rate<sup>d</sup> (C) | 0.382 | 0.113 | 0.393 | −0.082 | 0.270 | 0.219 | 0.268 | 0.535 | 0.762 |
| | (0.974) | (0.155) | (0.474) | (−0.129) | (0.250) | (0.096) | (0.643) | (0.919) | (0.805) |
| Change in short term interest rate * working capital dependency (D) | −0.974 | 0.146 | −6.055 | −4.513*** | −4.631** | −7.051 | −0.438 | −0.433 | −2.415 |
| | (−0.681) | (0.074) | (−1.342) | (−3.014) | (−2.365) | (−1.539) | (−1.109) | (−0.869) | (−1.644) |
| Change in short term interest rate * investment capital dependency (E) | 0.303 | 0.489 | 3.279 | 1.175 | 2.943 | −1.156 | 0.129 | 0.017 | 1.067 |
| | (0.205) | (0.231) | (0.779) | (0.639) | (1.339) | (−0.219) | (0.328) | (0.038) | (1.201) |
| Change in capital expenditures (percent of assets)<sup>d</sup> | −0.384 | −0.746 | −0.216 | 0.324 | 0.328 | 0.139 | 0.516 | 0.210 | 0.008 |
| | (−1.351) | (−1.288) | (−1.094) | (0.919) | (0.712) | (0.223) | (1.295) | (0.695) | (0.015) |
| Variables                                      | Utilities | Retail | Services |
|-----------------------------------------------|-----------|--------|----------|
|                                               | ALL       | AEs    | EMs      | ALL       | AEs    | EMs      | ALL       | AEs    | EMs      |
| Leverage: total debt in t−1 (log, thousand USD)| −0.099    | −0.144 | −0.367   | −0.132    | 0.165   | −0.882   | 0.502*    | 0.269   | 1.104*   |
|                                               | (−0.188)  | (−0.191)| (−0.551)| (−0.173)  | (0.187) | (−0.522) | (1.881)   | (0.893) | (1.899) |
| Size: total assets in t−1 (log, thousand USD)  | −0.259    | −0.244 | 0.475    | −0.456    | −0.837  | 0.978    | 0.040     | 0.317   | −0.973   |
|                                               | (−0.402)  | (−0.276)| (0.565)| (−0.566)  | (−0.876)| (0.453)  | (0.118)   | (0.829) | (−1.258) |
| Short-term debt in t−1 (percent of total debt)| −0.021    | −0.042 | 0.004    | −0.019    | −0.020  | 0.001    | −0.005    | −0.008  | 0.015    |
|                                               | (−1.114)  | (−1.433)| (0.157)| (−0.789)  | (−0.706)| (0.011)  | (−0.422)  | (−0.556)| (0.699)  |
| Balance sheet liquidity: cash in t−1 (percent of assets) | 0.005    | 0.042  | −0.127*  | −0.175*   | −0.124  | −0.268   | −0.012    | −0.013  | 0.019    |
|                                               | (0.108)   | (0.677)| (−1.821)| (−1.719)  | (−1.031)| (−1.204)| (−0.431)  | (−0.357)| (0.348)  |
| Observations                                  | 847       | 498    | 349      | 771       | 578    | 193      | 2,475     | 1,855   | 620      |
| Wald (Chi− squared) test                      | 250.2***  | 185.1***| 100.2***| 22.2***   | 22.8***| 10.3***  | 28.2***   | 22.8*** | 12.4***  |
| Number of countries                           | 45        | 29     | 16       | 38        | 23     | 15       | 42        | 27      | 15       |
| Number of clusters                            | 1887      | 1211   | 676      | 215       | 138    | 77       | 402       | 287     | 115      |

Notes: Robust t-statistics in parentheses estimated using clustered standard errors at three-digit sector level. Significance at ***p < 0.01; **p < 0.05; *p < 0.10. ALL = all countries in the sample; AEs = advanced economies; EMs = emerging markets

a Linear combination of the impulse variable coefficients indicated in each row and its interaction term with the respective sectoral variable evaluated at the median of the sectoral variable for the sample used in the regression

b All estimations use the two-stage least squares (2SLS) estimators and include sector-level dummies (not reported in the table)

c Fiscal impulse is defined as the negative of the change in structural public balances

d Fiscal impulse variable instrumented by un expected government spending measured by IMF staff forecast errors (a negative value indicates a tighter fiscal position) and lagged values of the change in short-term interest rates and changes in the capital expenditure to asset ratio
### Table 6  Horse race results for the change in capital expenditure per industry, 2009

**Sources:** Refinitiv Worldscope; IMF, World Economic Outlook database; and authors’ estimations

| Variables                                      | Manufacturing | Construction | Transportation | Wholesale |
|------------------------------------------------|---------------|--------------|----------------|-----------|
|                                                 | ALL | AEs | EMs | ALL | AEs | EMs | ALL | AEs | EMs | ALL | AEs | EMs | ALL | AEs | EMs |
| *Combined effects*<sup>a</sup>                  |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| Fiscal impulse (A) + (B)                        | 0.128*** | 0.130*** | 0.130 | −0.038 | −0.083 | 0.894** | −0.354 | −0.407 | −0.958 | 0.101 | 0.063 | −0.474 |     |     |     |
|                                                 | (3.324) | (2.748) | (1.022) | (− 0.580) | (− 1.286) | (1.969) | (− 1.321) | (− 1.313) | (− 1.085) | (1.426) | (0.746) | (− 1.480) |     |     |
| Monetary impulse via working capital dependency (C) + (D) | −0.018 | 0.029 | 0.165 | −0.038 | −0.083 | 0.894** | −0.354 | −0.407 | −0.958 | 0.101 | 0.063 | −0.474 |     |     |     |
|                                                 | (− 0.480) | (0.635) | (1.525) | (0.927) | (− 0.168) | (1.778) | (0.955) | (1.798) | (− 1.284) | (0.407) | (1.751) | (− 2.771) |     |     |
| Monetary impulse via investment capital dependency (C) + (E) | 0.005 | 0.083 | 0.170 | −0.038 | −0.083 | 0.894** | −0.354 | −0.407 | −0.958 | 0.101 | 0.063 | −0.474 |     |     |     |
|                                                 | (0.121) | (1.607) | (1.594) | (0.896) | (− 0.254) | (1.943) | (1.675) | (1.972) | (− 1.333) | (0.737) | (2.035) | (− 2.599) |     |     |
| *Regression results*<sup>b</sup>                |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| Fiscal impulse<sup>c</sup> (A)                  | 0.152** | 0.121 | 0.932** | 0.255 | 0.161 | 2.527* | −0.161 | −0.280 | −1.928 | −0.119 | −0.159 | −0.324 |     |     |     |
|                                                 | (2.007) | (1.406) | (2.535) | (1.007) | (0.862) | (1.838) | (− 0.460) | (− 0.671) | (− 1.388) | (− 0.837) | (− 0.862) | (− 0.568) |     |     |
| Fiscal impulse * business cycle sensitivity (B)  | −0.216 | 0.078 | −7.125*** | −1.227 | −1.024 | −10.512* | −1.104 | −0.728 | 5.566 | 2.130 | 2.143 | 1.573 |     |     |     |
|                                                 | (− 0.424) | (0.134) | (− 2.760) | (− 1.259) | (− 1.517) | (− 1.724) | (− 1.267) | (− 0.771) | (1.033) | (1.579) | (1.252) | (− 0.288) |     |     |
| Change in short term interest rate<sup>d</sup> (C) | −0.018 | 0.033 | 0.166 | 0.392 | −0.135 | 2.959** | 0.635* | 0.807* | −1.223 | 0.083 | 0.333** | −0.822*** |     |     |     |
|                                                 | (− 0.469) | (0.720) | (1.528) | (0.851) | (− 0.335) | (1.963) | (1.669) | (1.934) | (− 1.323) | (0.760) | (2.008) | (− 2.738) |     |     |
| Change in short term interest rate * working capital dependency (D) | −0.057 | −0.123*** | 0.052 | −0.243 | 0.274 | 2.588* | −1.258 | −0.798 | 2.059 | −0.136 | −0.300 | 0.607 |     |     |     |
|                                                 | (− 1.180) | (− 2.818) | (0.576) | (− 0.606) | (0.750) | (1.872) | (− 1.433) | (− 0.869) | (1.085) | (− 0.990) | (− 1.481) | (1.545) |     |     |
| Change in short term interest rate * investment capital dependency (E) | 0.147* | 0.217*** | 0.042 | 0.050 | −0.076 | 0.612* | −0.296 | −1.360 | 0.575 | 0.002 | 0.025 | −0.253 |     |     |     |
|                                                 | (1.701) | (2.648) | (0.228) | (0.497) | (− 0.824) | (1.787) | (− 0.523) | (− 1.643) | (0.920) | (0.022) | (0.226) | (− 0.779) |     |     |
| Change in sales (percent of assets)<sup>d</sup> | 0.037*** | 0.013** | 0.053*** | −0.000 | −0.001 | −0.026 | 0.025 | 0.004 | 0.055 | −0.000 | −0.000 | −0.009 |     |     |     |
Table 6 (continued)

| Variables                                      | Manufacturing | Construction | Transportation | Wholesale |
|------------------------------------------------|---------------|--------------|----------------|-----------|
|                                                | ALL | AEs   | EMs   | ALL | AEs   | EMs   | ALL | AEs   | EMs   | ALL | AEs   | EMs   |
| Leverage: total debt in t-1 (log, thousand USD) |     |       |       |     |       |       |     |       |       |     |       |       |
|                                                | (4.962)       | (1.978)     | (2.661)     | (−0.004) | (−0.054) | (−0.407) | (1.273) | (0.262) | (1.218) | (−0.731) | (−0.024) | (−0.776) |
|                                                | (−4.618)      | (−4.131)    | (−1.460)    | (−1.025) | (−0.289) | (−0.796) | (−2.714) | (−2.302) | (−0.876) | (−1.960) | (−2.313) | (1.377)  |
| Size: total assets in t-1 (log, thousand USD)  | 0.210***      | 0.285***    | −0.156      | 0.200* | 0.105    | 0.242    | 1.051*** | 0.969*** | 0.505   | 0.192** | 0.263*** | −0.448** |
|                                                | (4.447)       | (6.485)     | (−1.637)    | (1.657) | (0.725) | (1.241)  | (3.188) | (2.959) | (0.555) | (2.469) | (3.209) | (−2.143) |
| Short-term debt in t-1 (percent of total debt) | 0.008***      | 0.007***    | 0.012***    | 0.001  | 0.002    | −0.004   | 0.005   | −0.006  | 0.018   | 0.008* | 0.005    | 0.022**  |
|                                                | (4.136)       | (3.499)     | (3.302)     | (0.155) | (0.394) | (−0.412) | (0.351) | (−0.341) | (1.132) | (1.958) | (1.136) | (2.008)  |
| Balance sheet liquidity: cash in t-1 (percent of assets) | 0.018*** | 0.017*** | 0.028*** | 0.011 | 0.000 | 0.030 | 0.057** | 0.032 | 0.147** | 0.023*** | 0.013* | 0.046** |
|                                                | (4.738)       | (4.242)     | (3.582)     | (0.836) | (0.021) | (1.203)  | (2.200) | (1.332) | (2.083) | (2.695) | (1.806) | (2.435)  |
| Observations                                   | 8,437 | 5,052 | 3,385 | 842 | 446 | 396 | 418 | 292 | 126 | 935 | 680 | 255 |
| Wald (Chi− squared) test                       | 121.7***      | 139.5***    | 72.0***     | 13.6*** | 17.9*** | 10.3***  | 27.9*** | 31.8*** | 32.4*** | 31.4*** | 36.9*** | 35.0***  |
| Number of countries                            | 45 | 29 | 16 | 38 | 24 | 14 | 42 | 27 | 15 | 38 | 25 | 13 |
| Number of clusters                             | 1,913 | 1,230 | 683 | 110 | 65 | 45 | 155 | 101 | 54 | 284 | 191 | 93 |

Notes: Robust t-statistics in parentheses estimated using clustered standard errors at three-digit sector level. Significance at ***, p < 0.01; **, p < 0.05; *, p < 0.10. ALL = all countries in the sample; AEs = advanced economies; EMs = emerging markets

a Linear combination of the impulse variable coefficients indicated in each row and its interaction term with the respective sectoral variable evaluated at the median of the sectoral variable for the sample used in the regression

b All estimations use the two-stage least squares (2SLS) estimators and include industry-level dummies (not reported in the table)

c Fiscal impulse is defined as the negative of the change in structural public balances

d Fiscal impulse variable instrumented by unexpected government spending measured by IMF staff forecast errors (a negative value indicates a tighter fiscal position) and lagged values of the change in short-term interest rates and changes in the sales to asset ratio
Table 7  Horse race results for the change in capital expenditure per industry (concluded), 2009. Sources Refinitiv Worldscope; IMF, World Economic Outlook database; and authors’ estimations

| Variables                                                                 | Utilities | Retail | Services |
|---------------------------------------------------------------------------|-----------|--------|----------|
|                                                                            | ALL       | AEs    | EMs      | ALL       | AEs    | EMs      | ALL       | AEs    | EMs      |
| **Combined effects**<sup>a</sup>                                          |           |        |          |           |        |          |           |        |          |
| Fiscal impulse (A) + (B)                                                   | 0.223     | 0.254* | −0.551   | 0.256     | −0.041  | 0.576    | 0.044     | 0.004   | −0.125   |
| (1.641)                                                                   | (1.755)   | (−1.100) | (1.603) | (−0.279) | (0.901) | | (0.615) | (0.057) | (−0.453) |
| Monetary impulse via working capital dependency (C) + (D)                  | −0.289**  | −0.060 | −0.479   | 0.256     | −0.041  | 0.576    | 0.044     | 0.004   | −0.125   |
| (−2.460)                                                                  | (−0.440) | (−1.380) | (0.355) | (1.764) | (−1.280) | | (1.034) | (2.653) | (−0.281) |
| Monetary impulse via investment capital dependency (C) + (E)              | −0.278**  | −0.053 | −0.563*  | 0.256     | −0.041  | 0.576    | 0.044     | 0.004   | −0.125   |
| (−2.370)                                                                  | (−0.390) | (−1.670) | (0.530) | (1.882) | (0.015) | | (−0.730) | (0.106) | (−0.550) |
| **Regression results**<sup>b</sup>                                        |           |        |          |           |        |          |           |        |          |
| Fiscal impulse<sup>c</sup> (A)                                             | 0.083     | −0.154 | −1.126   | 0.371     | 0.277   | 0.480    | 0.046     | −0.060  | 0.261    |
| (0.439)                                                                   | (−0.859) | (−1.097) | (1.057) | (0.729) | (0.243) | | (0.313) | (−0.415) | (0.518) |
| Fiscal impulse * business cycle sensitivity (B)                            | 1.742     | 4.355** | 7.153    | −1.191    | −2.800  | 0.998    | −0.010    | 0.370   | −2.226   |
| (0.825)                                                                   | (2.038) | (0.895) | (−0.472) | (−0.931) | (0.065) | | (−0.011) | (0.426) | (−1.031) |
| Change in short term interest rate<sup>d</sup> (C)                         | −0.291*** | −0.040 | −0.679*** | 0.103     | 0.479*  | −0.711   | 0.014     | 0.143   | −0.247   |
| (−2.381)                                                                  | (−0.281) | (−3.025) | (0.506) | (1.865) | (−1.289) | | (0.150) | (1.441) | (−0.555) |
| Change in short term interest rate * working capital dependency (D)       | 0.040     | −0.578 | −0.910   | −0.154    | −0.505  | 0.223    | 0.081     | 0.062   | 0.416    |
| (0.111)                                                                   | (−1.540) | (−0.651) | (−0.398) | (−1.042) | (0.273) | | (0.906) | (0.678) | (0.665) |
| Change in short term interest rate * investment capital dependency (E)    | −0.543    | 0.545   | −0.535   | 0.886*    | 0.635   | 2.709**  | −0.175**  | −0.205** | −0.186   |
| (−1.239)                                                                  | (1.171) | (−0.416) | (1.943) | (1.439) | (2.063) | | (−2.064) | (−2.145) | (−0.512) |
| Change in sales (percent of assets)<sup>d</sup>                          | −0.004    | −0.024  | −0.093   | 0.003     | −0.002  | −0.044   | −0.001    | −0.001  | 0.102    |
| (−0.136)                                                                  | (−0.685) | (−0.862) | (0.274) | (−0.185) | (−1.329) | | (−1.130) | (−1.098) | (1.066) |
Table 7 (continued)

| Variables | Utilities | Retail | Services |
|-----------|-----------|--------|----------|
|           | ALL       | AEs    | EMs      | ALL       | AEs    | EMs     | ALL       | AEs    | EMs     |
| Leverage: total debt in t−1 (log, thousand USD) | −0.319*** | −0.158 | −0.494** | −0.306** | −0.458*** | −0.201 | −0.041 | −0.095 | −0.073 |
|           | (−2.590)  | (−0.979) | (−2.266) | (−2.309) | (−3.015) | (−0.692) | (−0.648) | (−1.569) | (−0.339) |
| Size: total assets in t−1 (log, thousand USD) | 0.519*** | 0.249 | 0.776*** | 0.464*** | 0.591*** | 0.056 | 0.121 | 0.179*** | 0.144 |
|           | (3.657)   | (1.341) | (2.916)   | (3.122)   | (3.564)   | (0.144) | (1.436) | (2.247) | (0.426) |
| Short− term debt in t−1 (percent of total debt) | 0.000 | −0.001 | 0.007 | −0.007 | −0.002 | −0.007 | 0.003 | 0.001 | 0.007 |
|           | (0.013)   | (−0.180) | (0.693)   | (−1.457) | (−0.413) | (−0.553) | (1.158) | (0.426) | (0.852) |
| Balance sheet liquidity: cash in t−1 (percent of assets) | 0.023** | 0.009 | 0.026 | 0.060*** | 0.035* | 0.093*** | 0.021*** | 0.016*** | 0.008 |
|           | (2.024)   | (0.639) | (0.948)   | (3.589)   | (1.698)   | (2.839)   | (4.827) | (3.315) | (0.345) |
| Observations | 825      | 492 | 333 | 800 | 601 | 199 | 2,542 | 1,933 | 609 |
| Wald (Chi− squared) test | 121.7*** | 139.5*** | 72.0*** | 86.8*** | 99.7*** | 36.2*** | 45.7*** | 42.3*** | 17.4*** |
| Number of countries | 45 | 29 | 16 | 39 | 24 | 15 | 43 | 28 | 15 |
| Number of clusters | 1,913 | 1,230 | 683 | 218 | 141 | 77 | 398 | 286 | 112 |

Notes: Robust t-statistics in parentheses estimated using clustered standard errors at three-digit sector level. Significance at ***p < 0.01; **p < 0.05; *p < 0.10. ALL = all countries in the sample; AEs = advanced economies; EMs = emerging markets

a Linear combination of the impulse variable coefficients indicated in each row and its interaction term with the respective sectoral variable evaluated at the median of the sectoral variable for the sample used in the regression

b All estimations use the two-stage least squares (2SLS) estimators and include sector-level dummies (not reported in the table)

c Fiscal impulse is defined as the negative of the change in structural public balances

d Fiscal impulse variable instrumented by unexpected government spending measured by IMF staff forecast errors (a negative value indicates a tighter fiscal position) and lagged values of the change in short-term interest rates and changes in the sales to asset ratio
Fiscal impulse is also statistically associated with an increase in the ratio of sales to total assets in other industries, such as construction, wholesale, and services. For construction, in particular, the association of the stimulus with an increase in sales is also significant for the two subcategories of economies in our sample: AEs and EMs.

For CAPEX, Tables 6 and 7 evince that the manufacturing industry has again a statistically significant positive coefficient for the fiscal impulse, both for the full sample and for AEs. The other statistically significant coefficient is obtained for the construction industry in the EM sample and utilities in AEs.

The monetary stimulus presents a less significant coefficient for these industry-level estimations. In turn, the initial firm-level controls display relatively similar results to the coefficients estimated presented in Tables 2 and 3. This is particularly the case for the estimations using the manufacturing industry sample, which contains most of the firms in our sample.

**Regional Differentiation**

We further investigate distinct policy stimulus impacts by geographic regions. The GFC diversely impacted various regions across the world. That was mainly due to those regions initial conditions, be it in terms of their (i) banking and financial sector exposure to the US subprime mortgage crisis, (ii) public finances, or (iii) firms’ performance. The beginning of the Eurozone crisis in 2009 may have led to different and exceptional monetary and fiscal policy measures in that region than in others in the world.\textsuperscript{15} The GFC also unveiled important differences in policy making views about the use of fiscal stimulus to counter macro-financial shocks across countries.

Therefore, we also perform estimations of policy stimuli on the change of the firms’ ratios of sales and capex to total assets per country groups. For that, we restrict our sample of firms for those located in the WEO geographical regions of Asia, Canada, and Europe,\textsuperscript{16} and run distinct regressions using the specification in Eq. (3) for each one of them. The results are displayed in Table 8.

The positive association between the fiscal impulse and the change in sales is particularly statistically significant for the group of European economies. For that region, the coefficient is highly significant and, its positive value, slightly higher than the one estimated for the full sample. As expected, the coefficient for the monetary stimulus for the European group of economies is also highly statistically significant and with the correct sign (negative). A one-percent decline in the short-term interest rate is associated with (i) a 1.16 percentage points increase in the ratio of sales to total assets through the external financial dependency for working capital and (ii) a 1.08 percentage points increase in the ratio of sales to total assets through the transmission channel of external finance for investment. The monetary stimulus

\textsuperscript{15} We thank two anonymous referees for raising that point.

\textsuperscript{16} We used Canada as a region, given that the US is excluded from our estimation sample. We do not perform estimations for other continents or regions, given that the number of firms in each of them is too limited, significantly impacting the estimations statistical power.
Table 8  Horse race results for both firms’ performance variables per selected world region, 2009. Sources Refinitiv Worldscope; IMF, World Economic Outlook database; and authors’ estimations

| Variables                                                                 | Sales                  | Capital expenditures |                  |
|--------------------------------------------------------------------------|------------------------|----------------------|------------------|
|                                                                          | Asia       | Canada   | Europe    | Asia       | Canada   | Europe    |
| Combined effects\(^a\)                                                   |            |          |           |            |          |           |
| Fiscal impulse (A) + (B)                                                  | 0.205      | −0.515   | 1.094***  | 0.129**    | 0.166*   | 0.031     |
|                                                                          | (0.796)    | (−1.150) | (4.736)   | (2.408)    | (1.789)  | (0.612)   |
| Monetary impulse via working capital dependency (C) + (D)                 | 0.483      | −0.361***| −1.163*** | −0.108*    | −0.048*  | −0.060    |
|                                                                          | (1.361)    | (−2.720) | (−4.613)  | (−1.690)   | (−1.650) | (−1.054)  |
| Monetary impulse via investment capital dependency (C) + (E)              | 0.385      | 0.113**  | −1.083*** | −0.100     | 0.015    | −0.060    |
|                                                                          | (1.035)    | (2.415)  | (−3.870)  | (−1.510)   | (1.028)  | (−0.990)  |
| Regression results\(^b\)                                                 |            |          |           |            |          |           |
| Fiscal impulse\(^c\) (A)                                                 | −0.813     |          | 0.956**   | 0.114      |          | 0.073     |
|                                                                          | (−1.357)   |          | (2.252)   | (0.891)    |          | (0.769)   |
| Fiscal impulse * business cycle sensitivity (B)                           | 8.704***   | −4.713   | 1.170     | 0.124      | 1.521*   | −0.356    |
|                                                                          | (2.497)    | (−1.152) | (0.368)   | (0.167)    | (1.791)  | (−0.579)  |
| Change in short-term interest rate\(^d\) (C)                             | 0.421      | −1.103***| −0.105    | −0.060     |          |           |
|                                                                          | (1.156)    | (−4.104) | (−1.602)  | (−1.010)   |          |           |
| Change in short-term interest rate * working capital dependency (D)       | 0.336***   | −0.690***| −0.211    | −0.019     | −0.092*  | 0.000     |
|                                                                          | (2.678)    | (−2.731) | (−1.077)  | (−0.726)   | (−1.666) | (0.001)   |
| Change in short-term interest rate * investment capital dependency (E)    | −0.157     | 0.376**  | 0.084     | 0.020      | 0.050    | −0.002    |
|                                                                          | (−1.161)   | (2.406)  | (0.547)   | (0.808)    | (1.018)  | (−0.085)  |
| Change in the other firm’s performance (percent of assets)\(^d\)         | 0.113      | 0.005    | 0.271**   | −0.000     | −0.003   | −0.001    |
|                                                                          | (1.321)    | (1.064)  | (2.151)   | (−0.685)   | (−0.727) | (−0.821)  |
| Leverage: total debt in t−1 (log, thousand USD)                          | 0.184      | 0.010    | 0.808***  | −0.177***  | 0.212    | −0.153*** |
|                                                                          | (1.132)    | (0.043)  | (3.110)   | (−5.630)   | (1.550)  | (−3.322)  |
Table 8 (continued)

| Variables | Sales | Capital expenditures |
|-----------|-------|----------------------|
|           | Asia  | Canada | Europe    | Asia  | Canada | Europe    |
| Size: total assets in t−1 (log, thousand USD) |       |        |          |       |        |          |
|          | − 0.116 | − 0.497 | − 1.321*** | 0.249*** | − 0.216 | 0.225*** |
|          | (− 0.553) | (− 1.576) | (− 4.247) | (5.458) | (− 1.520) | (4.040) |
| Short-term debt in t−1 (percent of total debt) |       |        |          |       |        |          |
|          | − 0.043*** | − 0.041*** | − 0.030*** | 0.004*** | − 0.001 | 0.006*** |
|          | (− 6.351) | (− 3.276) | (− 3.076) | (2.813) | (− 0.128) | (2.800) |
| Balance sheet liquidity: cash in t−1 (percent of assets) |       |        |          |       |        |          |
|          | − 0.073*** | 0.038 | 0.016 | 0.014*** | 0.034*** | 0.025*** |
|          | (− 4.005) | (1.326) | (0.654) | (4.649) | (3.590) | (6.286) |
| Observations |       |        |          |       |        |          |
|            | 10,734 | 959 | 4,413 | 10,811 | 902 | 4,503 |
| Wald (Chi-squared) test |       |        |          |       |        |          |
|            | 47.3*** | 165.7*** | 162.9*** | 94.4*** | 50.0*** | 105.2*** |
| Number of countries |       |        |          |       |        |          |
|            | 1 | 12 | 23 | 12 | 1 | 23 |
| Number of clusters |       |        |          |       |        |          |
|            | 146 | 1509 | 1470 | 1516 | 150 | 1499 |

Notes: Robust t-statistics in parentheses estimated using clustered standard errors at three-digit sector level. Significance at ***p < 0.01; **p < 0.05; *p < 0.10

a Linear combination of the impulse variable coefficients indicated in each row and its interaction term with the respective sectoral variable evaluated at the median of the sectoral variable for the sample used in the regression

b All estimations use the two-stage least squares (2SLS) estimators and include sector-level dummies (not reported in the table)

c Fiscal impulse is defined as the negative of the change in structural public balances

d Fiscal impulse variable instrumented by unexpected government spending measured by IMF staff forecast errors (a negative value indicates a tighter fiscal position) and lagged values of the change in short-term interest rates and changes in the other performance variable divided by the asset ratio
is also significant and with the correct sign for Canada, particularly when interacted with the dependence on external finance for working capital.

In terms of CAPEX, Table 8 shows that the fiscal impulse is statistically significantly associated with the change in CAPEX for Asia and Canada, but not for Europe. The monetary stimulus on the estimations for Asia and Canada is also marginally statistically significant and with the correct negative sign, particularly when accounting for the interaction of the change in short-term interest rate with the dependence on external finance for working capital. For those two regions, thus, the reduction in the short-term interest rate has significantly led to an increase in the firms’ ratio of capital expenditures to total assets.

Overall, the results in “Results” section indicate that the fiscal stimulus was significant in supporting higher firm sales in the peak of the GFC in 2009. The positive impact of the fiscal stimulus in terms of higher firms’ ratios of sales and capex to total assets seems to vary across sectors and to be notably relevant for the manufacturing and construction industries. Regarding cross-country and regional differences, Europe seems to have the biggest bang for the buck of the fiscal stimulus for sales, whereas Asia and Canada a significant impact on firms’ capex. The next section will check for the robustness of these results by using a different period sample and performing additional tests.

**Robustness Checks and Additional Tests**

This section performs additional tests and estimations to check for the robustness of the results presented above. As a first robustness check, we add 2010 to our period sample and perform the estimations in a panel data setup. The second subsection presents a series of different new tests maintaining our baseline specification in Eq. (3) but replacing or changing some of the tested variables.

**Panel estimation with 2010 data**

Although the peak of the GFC impact on firms’ performance seems to be in 2009, as suggested by Figs. 1 and 2 and Appendix Table 1 in ESM, the crisis may have impacted firms in different points in time and carryover effects. Therefore, as our first robustness check, we add firms’ data for 2010, creating a panel for the first two years of the crisis.

With the new panel data, we slightly modify Eq. (3) to:

\[
\Delta Y_{i,j,k,t} = \rho \Delta FP_{k,t} + \gamma BCS_j \times \Delta FP_{k,t} + \theta BCS_j + \delta \Delta MP_{k,t} + \phi EFDI_j
\]

\[
+ \theta EFDI_j \times \Delta MP_{k,t} + \mu EFDW_j + \sigma EFDW_j \times \Delta MP_{k,t}
\]

\[
+ \beta' Controls_{i,j,k,t-1} + \alpha_t + \tau_i + \epsilon_{i,j,k,t}
\]

where \( t = 2009, 2010 \) is the time subscript, indicating the sampled year in the panel; and \( \tau_i \) is a new time-fixed effect. We further use firm-fixed effects in Eq. (4), \( \alpha_i \), instead of industry-fixed effects, \( \alpha_j \), as in Eq. (3). All other terms and parameters are the same as in Eq. (3).

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17 We thank an anonymous referee for highlighting this issue.
Table 9  Panel estimation results for the change in sales, 2009−2010. *Sources* Refinitiv Worldscope; IMF, World Economic Outlook database; and authors’ estimations

| Variables | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
|-----------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| ALL       | ALL | ALL | ALL | ALL | ALL | ALL | ALL | AEs | EMs |

**Combined effects**

| Fiscal impulse (A) + (B) | − 1.296 | − 1.458 | − 1.402 | − 1.050 | − 1.939* | − 1.531 | − 1.178 | 1.825* | − 3.384*** |
| (− 1.271) | (− 1.289) | (− 1.308) | (− 1.004) | (− 1.714) | (− 1.317) | (− 1.133) | (1.913) | (− 2.853) |
| Monetary impulse via working capital dependency (C) + (D) | 2.721*** | 2.729*** | 2.727*** | 2.310*** | 2.927*** | 2.820*** | 2.423*** | 1.774*** | − 1.519 |
| (5.322) | (5.143) | (5.574) | (5.245) | (5.455) | (5.106) | (5.189) | (2.698) | (− 1.021) |
| Monetary impulse via investment capital dependency (C) + (E) | 2.905*** | 2.899*** | 2.908*** | 2.459*** | 3.109*** | 3.054*** | 2.635*** | 2.037*** | − 1.487 |
| (5.612) | (5.410) | (5.908) | (5.502) | (5.770) | (5.423) | (5.546) | (3.053) | (− 0.989) |

**Regression results**

| Fiscal Impulse (A) | − 2.343 | − 2.644 | − 2.637 | − 1.911 | − 3.632* | − 2.798 | − 2.240 | 3.367* | − 4.962** |
| (− 1.265) | (− 1.290) | (− 1.328) | (− 1.006) | (− 1.736) | (− 1.325) | (− 1.157) | (1.922) | (− 2.512) |
| Fiscal impulse * business cycle sensitivity (B) | 9.300 | 10.526 | 10.649 | 7.645 | 14.616* | 11.185 | 9.073 | − 13.175* | 13.487* |
| (1.237) | (1.272) | (1.331) | (0.994) | (1.733) | (1.316) | (1.167) | (− 1.853) | (1.837) |
| Change in short term interest rate (C) | 2.842*** | 2.841*** | 2.844*** | 2.409*** | 3.044*** | 2.974*** | 2.563*** | 1.959*** | − 1.515 |
| (5.533) | (5.338) | (5.805) | (5.440) | (5.673) | (5.337) | (5.442) | (2.961) | (− 1.008) |
| Change in short term interest rate * working capital dependency (D) | − 0.419*** | − 0.388*** | − 0.431*** | − 0.344*** | − 0.432*** | − 0.534*** | − 0.517*** | − 0.639*** | − 0.043 |
| (− 4.220) | (− 3.691) | (− 4.086) | (− 3.577) | (− 3.607) | (− 4.308) | (− 4.218) | (− 3.775) | (− 0.211) |
| Change in short term interest rate * investment capital dependency (E) | 0.263*** | 0.242*** | 0.274*** | 0.206*** | 0.282*** | 0.331*** | 0.311*** | 0.332*** | 0.162 |
| (3.355) | (2.777) | (3.333) | (2.863) | (2.991) | (3.459) | (3.979) | (2.689) | (1.258) |
| Change in capital expenditures (percent of assets) | 0.003 | 0.013* | − 0.001 | 0.024 | 0.003 | 0.019 | 0.019 | − 0.029 |
Table 9 (continued)

| Variables | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
|-----------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|           | ALL | ALL | ALL | ALL | ALL | ALL | ALL | AEs | EMs |
|           |     |     |     |     |     |     |     |     |     |
| Leverage: total debt in t−1 (log, thousand USD) |     |     |     |     |     |     |     |     |     |
|          | (1.216) | (1.726) | (− 0.378) | (1.391) | (1.245) | (1.406) | (1.467) | (− 0.448) |
|          | 3.794*** | 2.302*** | 2.354*** | 2.365*** |       |       |       |     |
|          | (10.645) | (6.281) | (4.728) | (4.549) |       |       |       |     |
| Size: total assets in t−1 (log, thousand USD) |     |     |     |     |     |     |     |     |     |
|          |     |     |     |     |     |     |     |     |     |
|          | 8.982**** | 14.545*** | 12.404*** | 11.333**** |       |       |       |     |
|          | (5.731) | (8.424) | (6.336) | (3.544) |       |       |       |     |
| Short term debt in t−1 (percent of total debt) |     |     |     |     |     |     |     |     |     |
|          |     |     |     |     |     |     |     |     |     |
|          | − 0.015 | 0.002 | 0.005 | 0.024 |       |       |       |     |
|          | (− 1.387) | (0.221) | (0.368) | (1.257) |       |       |       |     |
| Balance sheet liquidity: cash in t-1 (percent of assets) |     |     |     |     |     |     |     |     |     |
|          |     |     |     |     |     |     |     |     |     |
|          | 0.026 | 0.021 | 0.048 | − 0.011 |       |       |       |     |
|          | (1.488) | (0.637) | (1.172) | (− 0.187) |       |       |       |     |
| Observations | 40,682 | 39,294 | 31,152 | 39,286 | 30,662 | 38,808 | 30,366 | 19,746 | 10,620 |
| Adjusted R-squared | − 0.02 | − 0.03 | − 0.01 | 0.01 | − 0.05 | − 0.03 | 0.02 | 0.02 | 0.05 |
| Regression F test | 13.2*** | 10.1*** | 23.9*** | 14.7*** | 9.6*** | 9.2*** | 22.1*** | 16.1*** | 12.5*** |
| Kleibergen-Paap (LM) test for weak instruments | 27.3*** | 24.9*** | 37.2*** | 25.8*** | 36.8*** | 23.7*** | 35.4*** | 27.2*** | 35.6*** |
| Number of countries | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 28 | 14 |
| Number of clusters | 3,661 | 3,580 | 3,374 | 3,580 | 3,357 | 3,515 | 3,305 | 2,138 | 1,167 |

Notes: Robust t-statistics in parentheses estimated using clustered standard errors at three-digit sector level. Significance at ***p < 0.01; **p < 0.05; *p < 0.10. ALL = all countries in the sample; AEs = advanced economies; EMs = emerging markets

a Linear combination of the impulse variable coefficients indicated in each row and its interaction term with the respective sectoral variable evaluated at the median of the sectoral variable for the sample used in the regression

b All estimations use the two-stage least squares (2SLS) estimators and include firm- and time-fixed effects (not reported in the table)

c Fiscal impulse is defined as the negative of the change in structural public balances

d Fiscal impulse variable instrumented by unexpected government spending measured by IMF staff forecast errors (a negative value indicates a tighter fiscal position) and lagged values of the change in short-term interest rates and changes in the capital expenditure to asset ratio
Table 10 Panel estimation results for the change in capital expenditures, 2009–2010. *Sources: Refinitiv Worldscope; IMF, World Economic Outlook database; and authors’ estimations*

| Variables | (1) ALL | (2) ALL | (3) ALL | (4) ALL | (5) ALL | (6) ALL | (7) ALL | (8) AEs | (9) EMs |
|-----------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Combined effects$^a$ | | | | | | | | | |
| Fiscal impulse (A) + (B) | 0.143 | 0.142 | 0.121 | 0.159 | 0.102 | 0.178 | 0.144 | 0.364** | − 0.044 |
| | (0.958) | (0.956) | (0.805) | (1.082) | (0.663) | (1.167) | (0.927) | (2.197) | (− 0.238) |
| Monetary impulse via working capital dependency (C) + (D) | 0.110 | 0.108 | 0.215*** | 0.088 | 0.236*** | 0.105 | 0.211*** | 0.127 | 0.058 |
| | (1.468) | (1.436) | (2.825) | (1.155) | (3.030) | (1.328) | (2.682) | (1.066) | (0.280) |
| Monetary impulse via investment capital dependency (C) + (E) | 0.122 | 0.120 | 0.230*** | 0.099 | 0.252*** | 0.121 | 0.230*** | 0.143 | 0.068 |
| | (1.583) | (1.552) | (2.992) | (1.262) | (3.207) | (1.469) | (2.884) | (1.182) | (0.325) |
| Regression results$^b$ | | | | | | | | | |
| Fiscal impulse$^c$ (A) | 0.206 | 0.205 | 0.226 | 0.235 | 0.191 | 0.263 | 0.262 | 0.640** | 0.207 |
| | (0.737) | (0.737) | (0.803) | (0.858) | (0.666) | (0.915) | (0.905) | (2.091) | (0.681) |
| Fiscal impulse * business cycle sensitivity (B) | − 0.554 | − 0.552 | − 0.897 | − 0.675 | − 0.760 | − 0.736 | − 1.005 | − 2.359* | − 2.161* |
| | (− 0.467) | (− 0.469) | (− 0.782) | (− 0.581) | (− 0.656) | (− 0.607) | (− 0.858) | (− 1.893) | (− 1.804) |
| Change in short-term interest rate$^d$ (C) | 0.117 | 0.115 | 0.224*** | 0.094 | 0.246*** | 0.114 | 0.224*** | 0.138 | 0.062 |
| | (1.529) | (1.498) | (2.939) | (1.209) | (3.154) | (1.409) | (2.828) | (1.154) | (0.299) |
| Change in short-term interest rate * working capital dependency (D) | − 0.023 | − 0.023 | − 0.034 | − 0.020 | − 0.041* | − 0.032 | − 0.046** | − 0.038 | − 0.044 |
| | (− 1.037) | (− 1.005) | (− 1.616) | (− 0.867) | (− 1.845) | (− 1.251) | (− 2.008) | (− 1.177) | (− 1.280) |
| Change in short-term interest rate * investment capital dependency (E) | 0.023** | 0.023** | 0.024* | 0.021* | 0.027** | 0.028** | 0.028* | 0.021 | 0.033 |
| | (1.988) | (1.990) | (1.857) | (1.792) | (2.032) | (2.003) | (1.958) | (0.967) | (1.247) |
| Change in sales (percent of assets)$^d$ | 0.000 | 0.003 | 0.000 | 0.002 | 0.000 | 0.001 | 0.000 | 0.000 | 0.002 |
| | (1.007) | (1.344) | (0.771) | (1.107) | (0.485) | (0.288) | (0.061) | (0.700) |
### Table 10 (continued)

| Variables                                      | (1) ALL | (2) ALL | (3) ALL | (4) ALL | (5) ALL | (6) ALL | (7) ALL | (8) AEs | (9) EMs |
|------------------------------------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| Leverage: total debt in $t−1$ (log, thousand USD) | −0.258*** | −0.303*** | −0.298*** | −0.347*** |
|                                                | (− 4.356) | (− 4.753) | (− 3.601) | (− 3.387) |
| Size: total assets in $t−1$ (log, thousand USD) | 0.555*** | 0.978*** | 0.764** | 1.136*** |
|                                                | (3.763)   | (4.505)   | (2.394)   | (2.742)    |
| Short-term debt in $t−1$ (percent of total debt) | 0.000***  | 0.010***  | 0.005** | 0.023*** |
|                                                | (4.374)   | (4.740)   | (1.970)   | (5.707)    |
| Balance sheet liquidity: cash in $t−1$ (percent of assets) | 0.049*** | 0.060*** | 0.050*** | 0.086*** |
|                                                | (10.218)  | (9.525)   | (6.615)   | (6.924)    |
| Observations                                   | 38,972   | 38,894   | 31,466   | 38,888   | 30,996   | 38,388   | 30,698   | 20,076   | 10,622   |
| Adjusted R-squared                             | 0.02     | 0.02     | 0.02     | 0.02     | 0.02     | 0.03     | 0.03     | 0.00     | 0.05     |
| Regression F test                               | 31.3***  | 26.9***  | 31.1***  | 24.2***  | 30.3***  | 37.7***  | 36.4***  | 18.1***  | 23.8***  |
| Kleibergen-Paap (LM) test for weak instruments  | 30.7***  | 31.0***  | 5.2**    | 31.5***  | 5.1**    | 29.3***  | 5.5**    | 21.2***  | 36.6***  |
| Number of countries                             | 42       | 42       | 42       | 42       | 42       | 42       | 42       | 28       | 14       |
| Number of clusters                              | 3635     | 3633     | 3425     | 3633     | 3407     | 3565     | 3354     | 2180     | 1174     |

**Notes:** Robust t-statistics in parentheses estimated using clustered standard errors at three-digit sector level. Significance at ***p < 0.01; **p < 0.05; *p < 0.10. ALL = all countries in the sample; AEs = advanced economies; EMs = emerging markets

aLinear combination of the impulse variable coefficients indicated in each row and its interaction term with the respective sectoral variable evaluated at the median of the sectoral variable for the sample used in the regression

bAll estimations use the two-stage least squares (2SLS) estimators and include firm- and time-fixed effects (not reported in the table)

Fiscal impulse is defined as the negative of the change in structural public balances

cFiscal impulse variable instrumented by unexpected government spending measured by IMF staff forecast errors (a negative value indicates a tighter fiscal position) and lagged values of the change in short-term interest rates and changes in the sales to asset ratio
The results of the new estimations with Eq. (4) are reported in Tables 9 for sales and 10 for CAPEX. Given that the effects of the GFC on firms and the (fiscal and monetary) stimuli are more acute in 2009 (see also Fig. 3 and Appendix Table 2 in ESM), the estimated coefficients for both regressions—for sales and capex—are less significant using the panel data estimation specified in Eq. (4). This is true for (i) the different specifications (columns) tested in Tables 9 and 10; (ii) the estimated combined effects of the stimuli; (iii) their interaction terms; and (iv) some of the variables measuring the firms’ initial conditions.

For the change in the ratio of sales to total assets, Table 9, the coefficient of the fiscal impulse is only marginally statistically significant and with the correct sign for AEs. Although only marginally significant (at ten percent), its coefficient (1.825) is significantly higher in value than the one in our baseline estimation of Table 2. This suggests that the fiscal stimulus impact remained sizeable for AE firms even in 2010. For EMs, the coefficient of the fiscal impulse is also statistically significant but with the wrong sign. That outcome suggests that the fiscal stimulus was not relevant or even counterproductive on these economies particularly, as the GFC start to dwindle in 2010.

When including 2010 in the sample, the monetary stimulus accounting for both types of dependence on external finance also delivers statistically significant coefficients with the wrong sign in Table 9 for the full sample and AEs. Since this was not the same outcome in Table 2 and in line with Fig. 2 (boxplots), the result suggests a negative change in sales in 2010 given the maintenance of monetary stimulus in that year.18

Similar results are obtained for the change in CAPEX using the panel data estimation specified in Eq. (4). Table 10 shows a statistically significant and positive coefficient for the fiscal impulse for AEs only, and no significance for the other samples (full sample and EMs). The monetary stimulus presents again a statistically significant and positive (wrong) sign for the full sample in that table. This points once more to an unsuccessful monetary stimulus in 2010 or to the effects of a closer approximation to the zero-lower bound as the monetary stimulus continued in 2010.

Additional tests using the baseline estimation

Some additional tests are performed in this section using the baseline estimation of Eq. (3). Tables 11 and 12 present the main results. They display only some of the new coefficients and parameters estimated, which are relevant for the robustness check. Hence, for each of the two stimulus variables (fiscal and monetary), Tables 11 and 12 portrait the linear combination (total effect) of the coefficients—i.e., the sum of the coefficient of the stimulus variable with the coefficient of its interaction term with the sector-level variable—of four different tests. The other control variables are

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18 Another reason for the apparent “wrong” sign of that coefficient may be the faster approximation to the zero-lower bound in 2010. As next section shows, when we replace short-term interest rate by the shadow interest rate, which in principle mitigates the effects of that bound, results for 2009 further improve.
Table 11  Robustness tests of the baseline estimation for the change in sales to total assets. Sources Refinitiv Worldscope; IMF, World Economic Outlook database; and authors’ estimations

| Regression                              | Sample | Total effect of the fiscal impulsea,b | Monetary impulse via working capital dep.c,d | Monetary impulse via investment capital dep.c,e |
|----------------------------------------|--------|--------------------------------------|---------------------------------------------|-----------------------------------------------|
|                                        |        | Coefficient                          | t-statistic                                 | Coefficient                                   | t-statistic                                  | Coefficient                                   | t-statistic                                  |
| Baseline estimation (Table 2)          | ALL    | 0.778***                             | (5.605)                                     | 0.052                                         | (0.384)                                      | 0.118                                         | (0.814)                                      |
|                                        | AEs    | 0.930***                             | (5.481)                                     | 0.117                                         | (0.687)                                      | 0.189                                         | (1.029)                                      |
|                                        | EMs    | −0.686*                              | (−1.843)                                    | 0.008                                         | (0.022)                                      | 0.033                                         | (0.088)                                      |
| Alternative sectoral interaction termf | ALL    | 0.773***                             | (5.110)                                     | 0.102                                         | (0.747)                                      | 0.164                                         | (1.122)                                      |
|                                        | AEs    | 1.024***                             | (5.449)                                     | 0.168                                         | (0.983)                                      | 0.236                                         | (1.275)                                      |
|                                        | EMs    | −1.149***                            | (−2.790)                                    | 0.035                                         | (0.102)                                      | 0.049                                         | (0.142)                                      |
| Additional macro-controllersg          | ALL    | 1.080***                             | (6.797)                                     | −0.012                                        | (−0.070)                                     | 0.052                                         | (0.309)                                      |
|                                        | AEs    | 1.503***                             | (7.262)                                     | −0.388*                                       | (−1.770)                                     | −0.320                                        | (−1.390)                                     |
|                                        | EMs    | −0.258                               | (−0.573)                                    | 0.165                                         | (0.542)                                      | 0.172                                         | (0.565)                                      |
| Shadow interest rateh                  | ALL    | −0.256                               | (−0.545)                                    | −3.446***                                     | (−5.745)                                     | −3.549***                                     | (−5.474)                                     |
|                                        | UK     | −0.303                               | (−0.898)                                    | −0.075***                                     | (−2.677)                                     | 0.020                                         | (1.588)                                      |
|                                        | Euro Area | −0.417                               | (−0.884)                                    | −0.115***                                     | (−3.790)                                     | 0.061**                                       | (2.478)                                      |
| OLS estimationi                        | ALL    | −0.069                               | (−0.830)                                    | −0.542***                                     | (−4.788)                                     | −0.459***                                     | (−3.970)                                     |
|                                        | AEs    | 0.313***                             | (3.331)                                     | −0.170                                        | (−1.040)                                     | −0.018                                        | (0.100)                                      |
|                                        | EMs    | −0.590***                            | (−3.823)                                    | −0.628***                                     | (−3.547)                                     | −0.616***                                     | (−3.460)                                     |
Notes: Only coefficients for the linear combination of the fiscal impulse coefficient with the one on the interaction term. The same linear combination coefficient is reported for the monetary variables. Other results available upon request. Business cycle sensitivity is the interaction term employed with the fiscal impulse, unless stated otherwise. Robust z-statistics in parentheses, estimated with clustered standard errors at three-digit sector level. Significance at ***, **, * p < 0.01; 0.05; 0.10. ALL = all countries in sample; AE = advanced economies; EMs = emerging markets

a The fiscal variable in the linear combination reported is the change in government structural fiscal balance in percent of nominal potential GDP

b The change in government structural fiscal balance in percent of potential GDP is instrumented here by WEO forecast errors of (or unexpected) government expenditure as percent of nominal GDP

c The variable capturing monetary policy in this linear combination is the change in short-term interest rate interacted with one of the two indicators of external dependency on financing introduced to capture monetary policy sensitivity among different sectors. The change in short-term interest rate is instrumented by its first lag

d The indicator of external dependency on financing capturing monetary policy sensitivity among different sectors here is the intrinsic dependence on external finance for working capital (see “Methodology” section)

e The indicator of external dependency on financing capturing monetary policy sensitivity among different sectors here is the intrinsic dependence on external finance for investment (see “Methodology” section)

f The estimation uses as alternative sectoral interaction term with the fiscal impulse the 3-digit Standard Industrial Classification (SIC3) for each firm sector in the sample

g The estimation has the following additional macroeconomic controls on its specification: (i) a measure of external demand; (ii) the polity variable which measures the level of democracy in the country on the Polity IV Project database; and (iii) the ratio of the population in active labor age to the total population

h Shadow rate estimations included Austria, Finland, France, Germany, Italy, Luxembourg, Netherlands, Slovak Rep., Slovenia, and UK

i This estimation uses the baseline specification, estimating it without instrumental variables and by OLS results
Table 12  Robustness tests of the baseline estimation for the change in capital expenditures to total assets. Sources Refinitiv Worldscope; IMF, World Economic Outlook database; and authors’ estimations

| Regression                        | Sample | Total effect of the fiscal impulse<sup>a,b</sup> | Monetary impulse via working capital dep.<sup>c,d</sup> | Monetary impulse via investment capital dep.<sup>c,e</sup> |
|-----------------------------------|--------|-----------------------------------------------|-----------------------------------------------|-----------------------------------------------|
|                                   |        | Coefficient t-statistic                      | Coefficient t-statistic                      | Coefficient t-statistic                      |
| Baseline estimation (Table 3)     | ALL    | 0.091*** (3.127)                             | 0.029 (1.039)                               | 0.038 (1.301)                               |
|                                   | AEs    | 0.062* (1.732)                               | 0.099*** (2.679)                            | 0.121*** (3.167)                            |
|                                   | EMs    | −0.101 (−1.273)                              | −0.090 (−1.363)                             | −0.097 (−1.450)                             |
| Alternative sectoral interaction term<sup>f</sup> | ALL    | 0.092*** (3.043)                             | 0.037 (1.349)                               | 0.046 (1.588)                               |
|                                   | AEs    | 0.069* (1.895)                               | 0.106*** (2.970)                            | 0.127*** (3.387)                            |
|                                   | EMs    | −0.131 (−1.449)                              | −0.123* (−1.964)                            | −0.130** (−2.048)                           |
| Additional macro controls<sup>e</sup> | ALL    | 0.098*** (2.999)                             | 0.010 (0.287)                               | 0.020 (−0.609)                              |
|                                   | AEs    | 0.052 (1.214)                                | 0.013 (0.263)                               | 0.034 (0.667)                               |
|                                   | EMs    | −0.172* (−1.650)                             | −0.061 (−0.991)                             | −0.072 (−1.154)                             |
| Shadow interest rate<sup>h</sup>  | ALL    | 0.019 (0.155)                                | −0.138 (−0.861)                             | −0.188 (−1.169)                             |
|                                   | UK     | 0.041 (0.488)                                | 0.003 (0.517)                               | −0.002 (−0.800)                             |
|                                   | Euro area | −0.066 (−0.580)                           | −0.012* (−1.707)                            | 0.006 (1.690)                               |
| OLS estimation<sup>i</sup>        | ALL    | 0.028* (1.644)                               | −0.004 (−0.193)                             | −0.003 (−0.140)                             |
|                                   | AEs    | 0.079*** (3.766)                             | 0.057* (1.874)                               | 0.063*** (1.990)                            |
|                                   | EMs    | −0.050** (−1.997)                            | −0.056* (−1.944)                            | −0.055* (−1.879)                            |

Notes: Only coefficients for the linear combination of the fiscal impulse coefficient with the one on the interaction term. The same linear combination coefficient is reported for the monetary variables. Other results available upon request. Business cycle sensitivity is the interaction term employed with the fiscal impulse, unless stated otherwise. Robust z-statistics in parentheses, estimated with clustered standard errors at three-digit sector level. Significance at ***p < 0.01; **p < 0.05; *p < 0.10. All = all countries in the sample; AE = advanced economies; EMs = emerging markets

<sup>a</sup>The fiscal variable in the linear combination reported is the change in government structural fiscal balance in percent of nominal potential GDP

<sup>b</sup>The change in government structural fiscal balance in percent of potential GDP is instrumented here by WEO forecast errors of (or unexpected) government expenditure as percent of nominal GDP

<sup>c</sup>The variable capturing monetary policy in this linear combination is the change in short-term interest rate interacted with one of the two indicators of external dependency on financing introduced to
Table 12 (continued)
capture monetary policy sensitivity among different sectors. The change in short-term interest rate is instrumented by its first lag.

d. The indicator of external dependency on financing capturing monetary policy sensitivity among different sectors here is the intrinsic dependence on external finance for working capital (see “Methodology” section).

e. The indicator of external dependency on financing capturing monetary policy sensitivity among different sectors here is the intrinsic dependence on external finance for investment (see “Methodology” section).

f. The estimation uses as alternative sectoral interaction term with the fiscal impulse the 3-digit Standard Industrial Classification (SIC3) for each firm sector in the sample.

The estimation has the following additional macroeconomic controls on its specification: (i) a measure of external demand; (ii) the polity variable which measures the level of democracy in the country on the Polity IV Project database; and (iii) the ratio of the population in active labor age to the total population.

h. Shadow rate estimations included Austria, Finland, France, Germany, Italy, Luxembourg, Netherlands, Slovak Rep., Slovenia, and UK.

i. This estimation excludes (firm-level) fixed effects and controls only for world region (Asia, Europe, etc.) results.
the same as in Eq. (3) (unless stated otherwise), and their coefficients are available upon request. The first row also brings the results of the baseline estimation to facilitate comparability across the different tests.

The results indicate that the findings about the significant and positive impact of the fiscal impulse on firms’ profitability are robust to most of the variations of the baseline specification employed in Tables 11 and 12. While the value of the fiscal impulse coefficient varies depending on the robustness check performed, three tests (out of four) in Tables 11 and 12 display statistically significantly positive coefficients for the fiscal impulse. The change in short-term interest rate continues to be non-statistically significant in most of the robustness tests, apart from the one using the shadow interest rate.

As first robustness check, we replace the BCS sectoral variable used as interaction term with the fiscal impulse in the baseline specification by an alternative variable. For that, we naively employ the numeric 3-digit Standard Industrial Classification (sic3) code for each firm industry in the sample. This SIC3 code does not have any economic meaning and should be orthogonal to the firms’ ratios of sales and capex to total assets, to the fiscal impulse or to economic activity. As Tables 11 and 12 show, when performing that test, again, the fiscal impulse effect is highly statistically significant and positive for all country groups. Hence, that result suggests that the finding on the significance of the fiscal impulse to boost firms’ sales and CAPEX is independent of the sectoral interaction term chosen in Eq. (3).

Our second robustness check tests an alternative proxy for the monetary stimulus: the annual change in the shadow interest rate (Wu and Xia 2016).19 The shadow interest rate circumvents the issue on measuring the monetary policy stance close to the zero-lower bound. Its main advantage is that it can go into negative territory providing a measure of monetary stimulus even when the zero-lower bound is trespassed. Yet, it has two disadvantages for our analysis. First, we were able to apply that variable for a much more restrict sample of countries, comprising only ten countries (see “Corporate and Macroeconomic Data” section), even though they are all AEs (either the UK or belonging to the Euro area) and with their monetary policy closer to the zero-lower bound than other countries in our sample.20 Second, its measurement is not without challenges as acknowledged Wu and Xia (2016).

The results in Tables 11 and 12 show that, although with the sample reduced only to the UK and to the Euro area, the coefficients for the fiscal stimulus loses significance and the ones on monetary stimulus become statistically significant. In line with Table 8 (although here with a reduced number of countries), these findings indicate that for the Euro area and the UK, the monetary stimulus provided in those regions was relevant to mitigate the impact of the crisis on their firms’ sales and capital expenditure.

Our results also survive adding other macroeconomic variables as control. For that robustness check, three additional variables are chosen: (i) a proxy for economic

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19 We thank an anonymous referee for the suggestion of performing this test.

20 See Wu and Xia (2016, 2017, 2020). Shadow rates are also available for the US, but again that country is excluded from our estimation sample.
demand from trade partners (as in Gruss et al. 2020), which captures the interaction between countries; (ii) a measure of political system, here obtained from the polity variable from the Polity IV Project (Marshall and Jaggers 2016); and (iii) the ratio of the population in active labor age to the total population to capture the effects of demography, including through productivity growth (Poplawski-Ribeiro 2020).

Finally, most of the coefficients for the fiscal impulse and monetary stimulus maintain the sign and statistical significance of Tables 2 and 3 when Eq. (3) is estimated using Ordinary Least Squares (OLS). Those findings are presented in the last rows of Tables 11 and 12.

Concluding Remarks

This paper investigates whether the fiscal stimulus response to the global financial crisis impacted the firms’ ratios of sales and capital expenditures to their total assets. Using firm-level data from the Refinitiv Datastream Worldscope database for at least 17,253 non-financial firms in cross-sectional analyses in 45 advanced and emerging economies, our findings indicate that the fiscal stimulus provided (interacted with a measure of business cycle sensitivity) was significant in mitigating some of the negative impacts of the GFC on firms’ sales and capital expenditures in 2009. Our proxy of monetary stimulus is less significant for our overall regression, showing statistical significance only in some samples and regions investigated.

From an industry perspective, firms in the manufacturing industry presented a highly statistically significant and positive association of the fiscal stimulus (interacted with the business cycle sensitivity) with sales and with capital expenditures. The fiscal stimulus is also marginally significant for some other industries with relatively fewer firms in our sample, such as and construction, wholesale and services in the case of sales and utilities in the case of capex for AEs.

Our regional analysis shows, moreover, that firms in advance economies have a positive association of the change in the ratios of sales and capex to total assets with the fiscal impulse. For EMs, that association is marginally significant and negative. The sample splits in world regions further evince that Europe had the most statistically significant impact of the fiscal stimulus in the increase of its firms’ sales. As expected, the monetary stimulus is also highly statistically significant, impacting firms’ sales positively in Europe and Canada. This is even more apparent when shadow interest rates are used as a robustness test for some countries of the Euro area and the UK. For those countries, monetary stimulus seems more effective than fiscal policy during the GFC. Regarding capex, Asia and Canada present a statistically significant and positive impact of the fiscal impulse in their firms’ investments. The monetary stimuli in those two regions are also statistically significant and with the correct negative sign, particularly when interacted with the dependence on external finance for working capital.

Our baseline findings further survive a series of robustness checks. Those include the addition of one extra year, 2010, in the analysis as well as several tests regarding our baseline estimations. For most of the tests, our qualitatively baseline results
on the importance of the fiscal stimulus to mitigate the impact of the GFC on firms’ sales and capital expenditures remain.

Overall, the fact that the fiscal stimulus was associated with an increase in firms’ sales and capital expenditures during the global financial crisis suggests that, in the occurrence of new economic or financial shocks, fiscal policy could be recommended as a policy instrument to mitigate the impact of those shocks. Such result is thus relevant for the understanding and design of the current response to COVID-19. Moreover, given the differences in social contact intensity, the current pandemic is generating very diverse economic impacts across industries and regions. This calls for a calibration of the financial support provided by governments for each one of those specific industries, also depending on the initial situation of the firms as well as the macroeconomic conditions of the country (see also Igan et al., forthcoming).

Several directions for further research could be pursued. For instance, future research could investigate the impact of fiscal policy on firms’ wage bill, employment, research and development, and productivity. The former two variables would be of particular interest, given that lower-income workers have the highest marginal propensity to spend. The latter two variables, in turn, would be relevant given the current global productivity slowdown and its long-term impacts (Adler et al., 2017). Some of the sectoral results as well as a more detailed analysis about which transmission mechanisms and type of fiscal instruments—i.e., types of taxes and spending (e.g., public investment, transfers, purchase of goods and services)—lead to a higher effectiveness of the fiscal stimulus in supporting increased sales and capex could be further explored, including in the current context of COVID-19.

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