Journal of Monetary Economics 62 (2014) 41–58

Contents lists available at ScienceDirect

Journal of Monetary Economics

journal homepage: www.elsevier.com/locate/jme

Cyclical fiscal policy, credit constraints, and industry growth

Philippe Aghion [a], David Hémous [c], Enisse Kharroubi [b,*]

[a] Harvard University, USA
[b] Bank of International Settlements, Switzerland
[c] INSEAD, France

ARTICLE INFO

Article history:
Received 8 June 2010
Received in revised form
12 December 2013
Accepted 13 December 2013
Available online 30 January 2014

Keywords:
Growth
Financial dependence
Fiscal policy
Countercyclicality

ABSTRACT

What are the effects of cyclical fiscal policy on industry growth? We show that industries with a relatively heavier reliance on external finance or lower asset tangibility tend to grow faster (in terms of both value added and of labor productivity growth) in countries that implement fiscal policies that are more countercyclical. We reach this conclusion using Rajan and Zingales's (1998) difference-in-difference methodology on a panel data sample of manufacturing industries across 15 OECD countries over the period 1980–2005.

1. Introduction

Standard macroeconomic textbooks generally separate the analysis of long-run growth from that of short-term growth. Long-run growth is linked to structural characteristics of the economy (education, R&D, openness to trade, financial development) while the short-term analysis emphasizes the short-term effects of supply or demand shocks and the effects of macroeconomic policies (fiscal and/or monetary) aimed at stabilizing the economy. Yet the view that short-run stabilization policies should have no significant impact on long-run growth has been challenged by several empirical papers, notably Ramey and Ramey (1995), who find a negative correlation in cross-country regression between volatility and long-run growth.[1] More recently, using a Schumpeterian growth framework, Aghion et al. (2010) have argued that higher macroeconomic volatility affects the composition of firms' investments and, in particular, pushes towards more procyclical R&D investments in firms that are more credit-constrained.

This paper takes a further step by analyzing the effect of stabilizing fiscal policy on (industrial) growth, and how this effect depends upon the financial constraints faced by the industry. The first part of the paper builds on Aghion et al. (2010) to sketch the theoretical argument that rationalizes our empirical strategy and predictions. In this framework, firms can invest either in short-run projects, or in productivity-enhancing long-term projects (e.g. R&D investments). Short-term projects face an aggregate productivity shock while the completion of long-term innovative projects is subject to a liquidity risk: such projects fail to deliver output and increase knowledge if some reinvestment is not carried out during the interim period. Reinvestment needs can then be met using output from short-term projects and/or through borrowing on the capital market. Yet because of credit market imperfections, a fraction of firms in the industry can only use retained earnings to meet their reinvestment needs.

* Corresponding author. Tel.: +41 61 280 9250; fax: +41 61 280 9100.
E-mail address: Enisse.Kharroubi@bis.org (E. Kharroubi).

[1] Additional evidence can be found in Bruno (1993) on inflation and growth or more recently, Imbs (2007).

0304-3932/$ - see front matter
http://dx.doi.org/10.1016/j.jmoneco.2013.12.003

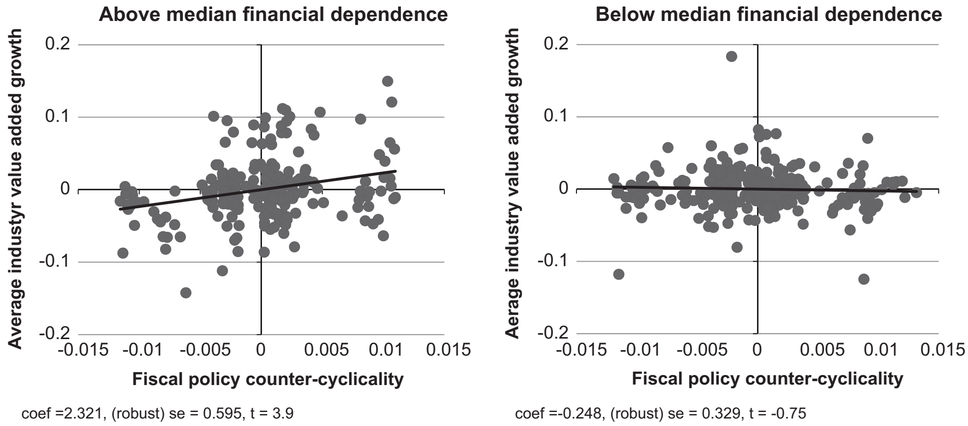

Fig. 1. The effect of fiscal policy counter-cyclicality on industry real value added growth. *Note*: The left (resp. right) hand panel is the scatter plot of real value added average growth for industries with below (resp. above) median financial dependence against the output gap sensitivity of total fiscal balance to potential GDP, controlling for the industry initial share in total manufacturing value added and industry specific effects. Average growth and output gap sensitivity computed over 1980–2005.

Then if credit market imperfections bind only in the low state of the world, reducing the volatility of aggregate shocks increases the likelihood that long-term projects survive liquidity shocks in the bad state without affecting what happens in the good state where credit constraints do not bind. Moreover, the higher the fraction of credit constrained firms, the larger the positive effect from reducing aggregate volatility on the equilibrium fraction of long-term projects that survive liquidity shocks. A countercyclical fiscal policy that reduces aggregate volatility should therefore have a positive impact on the growth rate of more credit-constrained industries.[2]

The second part of the paper takes this prediction to the data. Departing from the existing empirical literature on volatility and growth, which relies mainly on cross-country regressions, the paper follows the methodology developed in Rajan and Zingales (1998). We use cross-country/cross-industry panel data on a sample of 15 OECD countries over the period 1980–2005, to test whether industry growth is significantly affected by the interaction between fiscal policy countercyclicality (computed for each country) and external financial dependence or asset tangibility (measured for the corresponding industry in the US). Fig. 1 summarizes our main findings: it plots value added growth for a set of manufacturing industries as a function of total fiscal balance to potential GDP countercyclicality, controlling for initial industry size. The left-hand panel in Fig. 1 depicts this relationship for industries with below-median levels of financial dependence, whereas the right-hand panel plots this relationship for industries with above-median levels of financial dependence.[3] A more countercyclical fiscal policy has virtually no effect on value added growth for industries with below-median levels of financial dependence, i.e. those that face milder credit constraints. On the contrary, a more countercyclical fiscal policy has a positive and significant impact on real value added growth for industries with above median-levels of financial dependence, i.e. with tighter credit constraints. Using the same methodology, a similar type of result can be derived by decomposing the sample between industries with below-median asset tangibility and industries with above-median asset tangibility.

The empirical analysis in this paper aims at establishing the robustness of these findings. The empirical results can be summarized as follows. First, fiscal policy countercyclicality – measured as the sensitivity of a country's total or primary fiscal balance (relative to GDP) to time variations in its output gap – has a more positive and significant impact on industry growth the higher the corresponding US industry's reliance on external finance, or the lower its degree of asset tangibility. This result holds whether industry growth is measured by real value added growth or by labor productivity growth. Moreover, the effect of the interaction between industry financial constraints and countercyclical fiscal policy on growth is stronger and more significant in slumps than in booms, which in turn echoes the asymmetry between good and bad states emphasized in the theoretical argument.

One can then assess the magnitude of the corresponding difference-in-difference effect, i.e. how much extra growth is generated when fiscal policy countercyclicality and financial constraints move from the first to the third quartile. The figures happen to be relatively large, especially when compared to the equivalent figures in Rajan and Zingales (1998). This, in turn, suggests that the effect of a more countercyclical fiscal policy in more financially constrained industries is economically

[2] See Aghion et al. (2012) for firm-level evidence of an asymmetric effect of credit constraints on R&D over a firm's business cycle.

[3] More precisely, the estimated equation is $g_{i,c}=\alpha_i+\beta fp_c-\delta \log y_{i,c}+\varepsilon_{i,c}$, where $g_{i,c}$ is the average growth in real value added in industry i in country c for the period 1980–2005, α_i is a full set of industry dummies, fp_c is the fiscal policy countercyclicality (here, the output gap sensitivity of total fiscal balance to potential GDP) for the period 1980–2005, $y_{i,c}$ is the ratio of value added in industry i in country c to total manufacturing valued added in country c in 1980. Parameters for estimation are α_i, β and δ, while $\varepsilon_{i,c}$ is a residual. This equation is estimated separately for industries with below-median financial dependence and with above-median financial dependence. For the former, the estimated coefficient β is -0.25 and is insignificant at standard confidence levels. For the latter, the estimated coefficient β is 2.32 and is significant at standard confidence levels (5% level).