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Macroeconomic adjustment under loose financing conditions in the construction sector

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ABSTRACT

We provide a model with sector-specific debt-collateral constraints to analyze how asymmetric financing conditions across sectors affect the aggregate investment, credit and output composition. In our model, investments in the construction sector allow for higher leverage than investments in the non-durable consumption goods sector. When borrowing constraints bind in both sectors, unit returns in the construction sector are lower due to a positive *pledgeability premium*, and changes in interest rates have a non-monotonic effect in the sectoral composition of investment. Specifically, a fall in interest rates triggers a relative rise in investment in the consumption goods sector when rates are relatively high, whereas the opposite effect obtains when rates are sufficiently low. We argue that this prediction of the model, which depends critically on the asymmetries of financing conditions across sectors, is consistent with the evidence for a number of OECD countries during the decade before the 2007/2008 crisis

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1. Introduction

In the absence of financial market imperfections, the funding available should be allocated across different investment projects so that their marginal financing costs equal their marginal revenue. This allocation principle, however, need not hold in the presence of financial friction. This is the case, for instance, when some investors can not obtain as much financing as they would wish at the going rate. Under such circumstances, there may persist a positive gap between an investment project's marginal revenue and its marginal financing cost. As this happens, profit maximizing investors will optimally weight the return from each unit invested in a project against the financially constrained size of the project, in which case nothing precludes that a sizeable volume of funds will be channeled to investment projects in sectors with low unit returns if such sectors enjoy relatively loose financing conditions that allow for large projects.

Based on the previous reflection, the objective of this paper is to explore the macroeconomic effects of asymmetries in the severity of collateral constraints across productive sectors. The underlying idea behind the assumption about sector-specific financing conditions is that the ability of a lender to liquidate and recover a loan in case of default is a key determinant of a loan's conditions, as argued by Shleifer and Vishny (1992). In particular, borrowers generally obtain better financing conditions the higher is the resale value of the assets that they provide as collateral. Therefore, it is natural

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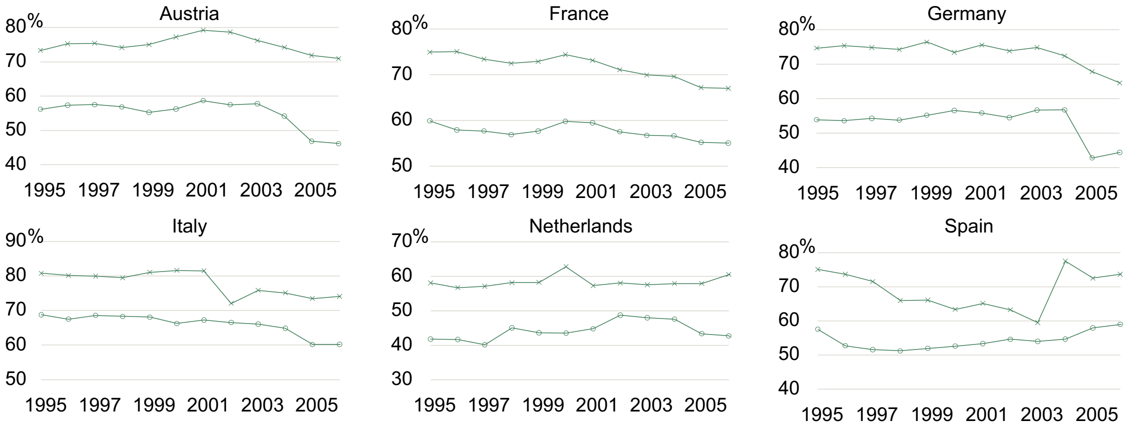

Fig. 1. Debt to total assets for construction (- × -) and manufacturing firms (-○-).
Source: European Commission, BACH database (see Drudi et al., 2007).

to face better external financing conditions when a firm invests in tangible assets, like real estate, than in projects that may lose a substantial fraction of their value if the original investor is forced to liquidate them.[1] Taking this reasoning at the sector-level, one could then argue that the construction sector would tend to face better financial conditions than the other main sectors in the economy given that, in relative terms, the construction sector consists on the exploitation of abundant tangible assets and standard production technologies.

To the extent that a firm's financing structure is shaped by its conditions of access to external funding, data on the financing mix between internal and external funds should be informative of the underlying financial conditions faced by firms operating in different sectors. Along these lines, Fig. 1 shows the leverage ratio (defined as debt over total assets) for firms in the construction and manufacturing sectors in the main European economies over the period 1995–2006. Although both supply and demand factors are likely to influence the leverage ratios shown in this figure, the fact that construction firms have been substantially more leveraged than manufacturing firms in all countries and for the whole sample period may be seen as indicative of a comparative advantage in the access to debt. More formally, several recent empirical studies have found support for the idea that firms that hold larger real estate portfolios face better financing conditions. For instance, Chaney et al. (2012) estimate an elasticity of corporate investment with respect to the value of corporate real estate of 6 per cent for the typical U.S. firm over the period 1993–2007. They also find evidence that this link between collateral and investment operates through the positive effect of a rise in collateral on debt capacity. Similar effects have been recently found by Liu et al. (2011), in the U.S. and by Gan (2007) in Japan over the 1990s. Of special interest for the arguments developed in this paper is the empirical analysis of Campello and Giambona (2012), who examine the relation between asset composition and capital structure by considering the effect of the degree of resaleability of tangible assets on leverage. Exploiting data drawn from firms operating in the U.S., they show that the presence of resaleable tangible assets in the balance-sheet is an important driver of leverage. Interestingly, across the several types of tangible assets, they find that land and buildings – which amount for the larger part of the assets of construction firms – have the highest explanatory power for leverage.

In line with the previous evidence, we develop a model in which the construction sector – which produces a durable non-tradeable good, *housing* – faces looser collateral requirements vis-a-vis the sector of non-durable tradeable goods (*consumption goods*), and analyze how this financial asymmetry shapes the sectoral allocation of credit, investment and output in response to a persistent fall in the real interest rate, as observed in most developed economies over the years that preceded the bust of the crisis in 2007. In this model, investors decide in which sector to invest. In so doing, they face two types of restrictions: (i) collateral constraints, which link the maximum amount of external financing available for a project to a fraction of the discounted resale value of its future output and (ii) minimum-scale restrictions, such that only projects of a minimum size can be executed. Along the lines of the reasoning above, we assume that investors in the construction sector can afford, *ceteris paribus*, a more leveraged financing structure.

A direct consequence of the financial asymmetry across sectors is that a *pledgeability premium*, in the form of a lower unit return in housing, arises in equilibrium. Indeed, as collateral constraints bind, optimizing investors face a trade-off between lower unit returns but larger projects in the housing sector and larger unit rents but smaller projects in the consumption sector.

The particular shape of the previous trade-off is strongly affected by the level of the interest rate. When interest rates are relatively high, leverage is low in both sectors and differences in the size of the largest project in each sector are small.

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[1] Hart and Moore (1994) provide a foundation for the existence of borrowing limits based on the notion of strategic default, which follows in a context where investors can not commit to not withdraw their human capital from their investment projects. Holmstrom and Tirole (1997) also build a related theory of limits to external finance based on contract incompleteness and limited enforceability.

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