Sunk capital, unions and the hold-up problem: Theory and evidence from cross-country sectoral data

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ABSTRACT

In this paper we study the hold-up problem by considering the effect of union bargaining power on the level of investment per worker across sectors characterised by different levels of sunk capital investment. We develop a search and matching model with heterogeneous sectors and ex-post collective wage bargaining and test the predictions of the model using a difference-in-difference approach on manufacturing sector data in a set of OECD countries during the period 1980–2000. We find that union power reduces investment per worker particularly in sunk capital intensive industries. We refine our empirical analysis showing that the underlying hold-up problem is exacerbated when strikes are not regulated after a collective contract is signed and there is no arbitration, while the presence of social pacts may sustain cooperative equilibria that alleviate the hold-up problem. Our results are robust to a series of controls and possible endogeneity of union power.

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1. Introduction

How relevant are contractual incompleteness and labour market institutions in shaping firms' incentives to invest? What are the channels through which such institutions influence physical capital accumulation? What is the role of the degree of sunkness and the timing of investments by firms? In this paper we try to answer the above questions by focusing on the relation between sunk capital, union bargaining power and the underlying hold-up problem. We construct a search and matching model with sunk investment and ex-post collective wage negotiations in order to study the effects of union bargaining power on investment per worker. We then bring the model to the data by evaluating the quantitative effect of coverage of union bargaining agreements on the levels of investment per worker across manufacturing sectors in a set of OECD countries during the period 1980–2000.

We show that higher union power has a relatively stronger negative effect on investment in sectors with a larger proportion of sunk physical capital. The reason rests on the classic concept of hold-up as analysed by Grout (1984): in a setting in which

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firms make their investment decisions before the wage negotiation takes place, a rise in union bargaining power increases the quasi-rent workers receive (via higher wages) without paying any capital cost. Anticipating this, firms decide to invest less.

We further develop the basic intuition of Grout (1984) in a matching model with capital investment: in particular, we extend the model proposed by Acemoglu and Shimer (1999) by allowing for different sunk capital intensities across sectors. In our model, the degree of sunkness is captured by the amount of capital that firms cannot re-let when there is no production. We show that stronger union bargaining power translates into relatively lower rates of investment per worker in sunk capital intensive sectors. The intuition is the following: union power pushes unemployed workers to search for jobs in the sectors where the hold-up problem is more relevant and wages are expected to be higher. Moreover, a more powerful union generally dampens vacancy creation (as expected profits are lower), but in the sectors with a larger share of sunk capital, where the increase in job applications reduces the expected duration of a vacancy and the opportunity costs of idle capital equipment, this happens to a lesser extent. In order to ensure that not all unemployed workers stop applying for their jobs, firms in the low sunk capital sectors react by reducing capital investment less than those operating in high sunk capital industries.

We test the theoretical predictions of the model using the difference-in-difference approach proposed by Rajan and Zingales (1998). In particular, we interact an indicator of union power at the country level (proxied by the coverage of union bargaining agreements) with a sectoral measure of sunk capital intensity, which is invariant across countries and is derived from US industry data. The latter is defined, following Balasubramanian and Sivadasan (2009), as one minus the share of used capital investment in total capital investment outlays at the industry level.

Our main empirical results suggest that higher union power is associated to lower levels of investment per worker. In particular, our set of estimates imply an investment differential of about 13% between a sector at the 75th percentile (Transport equipment) and one at the 25th percentile of the sunk capital intensity distribution (Leather products) in a country at the 25th percentile of the union coverage distribution (such as the United Kingdom) compared to a country at the 75th percentile of union coverage (such as Spain). These results are robust to a large battery of sensitivity checks. First, we consider various measures of union power, and R&D intensity as an alternative proxy for the degree of sunk capital in each industry. Second, we include interactions of sunk capital intensity with country level variables potentially correlated with union coverage as well as interactions of union coverage with other industry characteristics potentially correlated with the share of sunk capital. Finally, we find that the effect of union coverage in sunk capital intensive sectors is larger in those countries where strikes are not regulated and arbitration is not legally binding. Moreover, the negative effect of unions is not statistically significant in the case of countries where the government routinely involves the confederations of unions and employers in the main economic policy decisions by means of "social pacts".

The paper relates to several strands of literature. It is part of the literature on the hold-up problem with relation-specific investments and contractual incompleteness, in which under-investment occurs if contracts cannot be enforced (Williamson, 1985; Grossman and Hart, 1986; Hart and Moore, 1999).[1] In a labour market environment, Grout (1984) shows that, in the presence of rent sharing, irreversibility of capital investments and the structure of wage bargaining reduce investments. Indeed, when long term contracts are not binding and capital investment is sunk, unions have the ex-post incentive to appropriate quasi-rents, undermining firms' incentives to invest. This intuition is discussed with reference to the UK Trade Union Immunity Laws, which prevented firms from suing a trade union that ex-post breached a labour agreement.[2] More recently, in an insightful and thorough paper, Card et al. (2014) propose a two-period model showing that the hold-up problem is likely to be mitigated if there is a credible threat of liquidation by the firm in the second period. Using a matched employer–employee dataset for the manufacturing sector of the Veneto region in Italy, they test the predictions of the model and find evidence that workers appropriate rents but after deducting the full cost of capital. This suggests that investment might be at its efficient level, even if the precision of their estimates does not allow them to exclude modest degrees of hold-up.

Another strand of literature related to our paper analyses the hold-up problem by focusing explicitly on the effect of unions on investment. Using data on US manufacturing companies, Hirsch (1991) and Cavanaugh (1998) find a substantial negative impact of unionisation on investment.[3] In turn, the evidence provided by Addison et al. (2007) on German establishments suggests that the presence of works councils has no effect on physical capital accumulation. Such contrasting evidence is also confirmed by Menezes-Filho and Van Reenen (2003) in their review of the effects of unions on R&D investment.

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[1] General equilibrium effects of specificity are studied by Caballero and Hammour (1998), who analyse how the market system provides an inefficient solution to the unresolved microeconomic contracting problems. More recently, Acemoglu et al. (2007) show that contractual incompleteness favours the adoption of less advanced technologies, thus shaping the pattern of endogenous comparative advantage. See also Nunn (2007).

[2] A large body of research has studied how agents may prevent the occurrence of hold-up even in the case of incomplete contracts (Hart and Moore, 1988; Malcomson, 1997). However, the possibility of renegotiation or unions' lack of commitment to future wages may hinder the ability of contractual arrangements to mitigate the hold-up problem (Krussel and Rudanko, 2012). The purpose of this paper is not to enter such a debate. In the theoretical part, we assume the existence of several obstacles that prevent contracting from eliminating the hold-up problem. In the empirical part we try to explore whether good labour relationships in general and long term relationships in particular might mitigate the hold-up problem.

[3] Hirsch (2004) reviews the literature on the effects of trade unions on investment, profitability and employment and finds that, at least for the US and Canada, investment levels are generally lower in unionised firms. See Lee and Mas (2013) for a recent study on the effect of unionisation on the equity value of US firms.