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journal homepage: [www.elsevier.com/locate/jfec](http://www.elsevier.com/locate/jfec)Debt, labor markets, and the creation and destruction of firms<sup>☆</sup>Andres Almazan<sup>a</sup>, Adolfo de Motta<sup>b</sup>, Sheridan Titman<sup>a,c,\*</sup><sup>a</sup> McCombs School of Business, University of Texas, Austin, TX 78712, USA<sup>b</sup> Desautels Faculty of Management, McGill University, Montreal, QC, Canada H3A 1G5<sup>c</sup> National Bureau of Economic Research, Cambridge, MA 02138, USA

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## ABSTRACT

We analyze the financing and liquidation decisions of firms that face a labor market with search frictions. By inducing bankruptcy, debt can facilitate the process of creative destruction (i.e., the elimination of inefficient firms and the creation of new firms) but can also lead to excessive liquidation and unemployment in particular, during economic downturns. Within this setting, we examine policy interventions that influence the firms' financing and liquidation choices. We consider the role of monetary policy, which can reduce debt burdens during economy-wide downturns, and tax policy, which can influence the incentives of firms to use debt financing.

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## 1. Introduction

Financial decisions at the corporate and household level can have a considerable effect on macroeconomic conditions (e.g., Bernanke and Gertler, 1989; Kiyotaki and Moore, 1997; and Bernanke, Gertler, and Gilchrist, 1999). A salient illustration of these effects is provided by the 2008 economic crisis, which was triggered by the substantial

leverage not only in the real estate and banking sectors but also in households and corporations (e.g., Brunnermeier, 2009; Eggertsson and Krugman, 2012; Brunnermeier, Eisenbach, and Sannikov, 2013). This paper studies how the financial choices of corporations interact with the overall level of economic activity through a specific channel, namely, the effect of capital structure choices on labor market conditions, i.e., wages and unemployment.

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Our examination of the interaction between capital structure choices and labor market conditions integrates a canonical macro-labor model, in which production requires a suitable match between workers and firms, with a canonical corporate finance model, in which debt plays a fundamental role limiting agency problems within the firm. Specifically, we combine a labor search model along the lines of [Pissarides \(2000\)](#), with a setting in which investors make debt choices to indirectly restrain managers who enjoy private benefits of control, e.g., [Jensen \(1986\)](#), [Stulz \(1990\)](#), and [Hart and Moore \(1995\)](#). In the resulting framework, we explore how firms' capital structure choices, through their effects on liquidation, affect the tightness of labor markets and the creation of new firms throughout the business cycle.<sup>1</sup>

Our model considers two generations of firms. The first generation includes established firms that could subsequently be liquidated, and the second generation are potential entrants that could hire the workers who leave the established firms that are liquidated. Firm entry (creation) affects the demand for labor and, hence, the ability of established firms to retain workers, and firm liquidation (destruction) affects the supply of labor and, hence, the process of firm creation. Both choices affect and are affected by labor market conditions, and capital structure plays an important role in this interaction because debt financing can result in bankruptcy, which can in turn influence firms' liquidation decisions. In a setting with search frictions, because liquidation decisions affect labor market conditions, a firms' debt obligations can impose externalities on workers and on emerging new firms.

Within the context of this model, we examine a number of policy issues, including tax policy that can either encourage (via subsidies) or discourage (via taxes) the use of debt financing by firms and monetary policy, which, by affecting the overall price level, can influence the real value of firms' nominal debt obligations. We also examine how expectations about monetary policy affect the capital structure of firms and, through this channel, how monetary policy influences the liquidation of established firms and the creation of new ventures.

Our analysis starts with the simplest form of our model, which includes a fixed number of established firms and an unlimited number of ex ante identical entrants that can emerge. In this setting, we find that there is no externality associated with debt financing and that the optimal subsidy or tax on debt is zero. However, there is still a role for policies that influence firms' liquidation choices because financial contracts cannot be made contingent on all possible macroeconomic shocks. For instance, by generating inflation, a loose monetary policy can reduce the real value of debt during economy-wide downturns and, as a result, reduce bankruptcies when liquidations are excessive.

We next consider a more general setting with heterogeneous entrants. When this is the case, capital structure choices are not in general socially optimal and can lead to either too

much or too little liquidation and unemployment even when private financial contracts can be made contingent on macroshocks. The deviation from the social optimum arises because of negative externalities imposed on unemployed workers in the event of liquidation (i.e., laid off workers compete with existing unemployed workers for jobs), positive externalities that benefit emerging new firms that need to hire labor, and pecuniary externalities imposed on existing firms. Depending on the magnitude of these effects, a social planner could want to use tax policy to induce firms to use either more or less debt financing.

Our model also generates a number of implications regarding the effect that labor market conditions have on firms' debt choices. Specifically, firms have higher debt ratios when the labor market more efficiently matches workers and firms and when unemployment levels are lower. Intuitively, when workers have better outside options, either because the labor market is efficient or because unemployment is low, established firms have lower continuation values, which aggravates their managerial free cash flow problem. Investors then increase leverage to further restrain managers. The analysis also shows that even when debt ratios are chosen optimally, the combination of search frictions and managerial agency problems generates distortions in liquidation choices, i.e., excessive liquidations in recessions and excessive continuation in booms. These distortions are greater when labor markets are more efficient and in the presence of positive technological shocks.

Our analysis is related to a number of papers that analyze other potential externalities created by corporate leverage, including theoretical contributions that consider other negative spillovers created by debt financing. For instance, bankruptcy-induced fire sales (as discussed in [Shleifer and Vishny, 1992](#); [Kiyotaki and Moore, 1997](#); [Lorenzoni, 2008](#)) impose negative externalities on other firms by affecting their collateral constraints. In addition, our analysis of potential positive externalities of liquidations is related to the [Schumpeter \(1939\)](#) ideas on creative destruction and to a number of more recent papers, e.g., [Caballero \(2007\)](#) and, in the context of internal capital markets, [Almeida and Wolfenzon \(2006\)](#). Also related is the study by [Caballero, Hoshi, and Kashyap \(2008\)](#), which shows that the inability of Japanese banks to shut down failing firms in the 1990s discouraged the entry of healthy firms.<sup>2</sup> Finally, a recent paper by [He and Matvos \(2015\)](#) considers a case in which debt facilitates firm exit when companies compete for survival in a declining industry and concludes that firms use less than the socially optimal amount of debt financing. We contribute to this literature by analyzing the effect of corporate debt in a labor market with search frictions, in which firm liquidation decisions impose externalities on workers as well as on emerging new firms.

<sup>1</sup> [Benmelech and Bergman \(2011\)](#) and [Chodorow-Reich \(2014\)](#) are two recent empirical contributions that show the relation between financial frictions and employment decisions.

<sup>2</sup> [Chun, Kim, Morck, and Yeung \(2008\)](#) suggest that findings of more firm-specific performance variation in countries with more transparent accounting, better financial systems, and more secure property rights partly reflect more intensive creative destruction in those economies. [Fogel, Morck, and Yeung \(2008\)](#) show that economies that experience more bankruptcies tend to grow faster.

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