



## Firms, shareholders, and financial markets<sup>☆</sup>

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### ABSTRACT

We study the influence of the financial market on the decisions of firms in the real market. To that end, we present a model in which the shareholders' portfolio selection of assets and the decisions of the publicly traded firms are integrated through the market process. Financial access alters the objective function of the firms, and the market interaction of shareholders substantially influences firms' behavior in the real sector. After characterizing the unique equilibrium, we show that the financial sector integrates the preferences of all shareholders into the decisions for production and ownership structure. The participation from investors in the financial market also limits the firms' ability to manipulate real prices, i.e., there is a loss of market power in the real sector. Note that, while the loss of market power changes expected profits, it is not detrimental to shareholders since the expected return of equity share depends on the variance (and not the mean) of profits. Indeed, any change in expected profits is absorbed by the financial price. We also show that financial access increases production, thereby altering the distribution of profits. In particular, financial access induces firms to take on more risk. Finally, financial access makes the relationship between risk-aversion and risk-taking ambiguous. For example, it is possible that an increase in risk-aversion leads to more risk-taking, i.e., the variance of real profits increases.

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### 1. Introduction

While the bulk of economic activity comes from publicly owned firms, the standard framework for a firm in industrial organization focuses on privately owned firms. Indeed, the real and financial sectors are usually studied independently. However, the real and

financial functions of the firm are strongly linked, as the prices of financial instruments are closely related to the profits, and, thus, the prices of goods in the real sector. This paper studies the influence of the financial market on the decisions of firms in the real market by considering the joint and simultaneous determination of real decisions and equilibrium asset prices. To that end, we present a model in which the shareholders' portfolio selection of assets and the decisions of the firms are integrated through the price in the financial market process. Financial access alters the objective function of the firms, and the market interaction of shareholders influences firms' behavior in the real sector. In particular, the financial sector integrates the preferences of all shareholders into the output and ownership decisions of the firm. The participation from investors in the financial market also limits the firms' ability to manipulate real prices, i.e., there is a loss of market power in the real sector.

Before presenting and discussing the results, we provide an overview of the model. In order to obtain a clear exposition of the link between the real and financial sectors, we consider an economy with one firm and one investor. We show in [Appendix B](#) that all

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our results hold in a model with several firms and several shareholders. In our model, we consider a monopoly in the real sector and perfect competition in the financial sector.<sup>1</sup> In the real market, the firm supplies a good, generating random profit. In addition, equity shares, which are risky assets linked to the random real profit, are sold in the financial market. The decisions of the firm are influenced by the decisions of the shareholders, whose objective is to maximize expected utility of final wealth. The group of shareholders is composed of one entrepreneur and one investor. The entrepreneur is the founder of the firm and the original claimant of the real profits. The entrepreneur is also the managing shareholder of the firm who undertakes a risky project in the real sector and interacts with the investor in the financial market in order to allocate risk, i.e., the random profit. While the profits of the firm are allocated among the shareholders, the entrepreneur retains control of the firm's decisions. Specifically, subject to real and financial demands, the entrepreneur decides both the level of output and the ownership structure of the firm. Yet the entrepreneur's decisions are influenced by the preferences of the investor through the price of the risky asset. Indeed, the resulting market price of the risky asset is determined by the optimal behavior of all the shareholders and is instrumental in influencing the decisions of the firm.

The role of the financial sector is twofold. First, the decisions of the firm (both the level of output and the ownership structure) reflect the preferences of all the shareholders. The financial price provides an incentive for the managing shareholder (the entrepreneur) to act on behalf of all shareholders. Second, the competitive financial sector and the interaction of the shareholders in the financial market limit the firm's ability to exercise market power in the real sector. To see this, consider first the benchmark situation in which the firm has no access to the financial sector (i.e., the firm is privately owned). Then, the firm receives revenues only from selling the real good and the price of the real good depends on the quantity decision. Moreover, because the firm is a monopoly in the real sector, the firm takes account of the effect of his quantity decision on the real price. In other words, the firm exercises full market power. Suppose next that the monopoly has access to the financial sector (i.e., the firm is publicly owned). With the introduction of a financial market, the objective of the firm is altered because it accounts for financial revenues from issuing equity shares. While, in equilibrium, the financial price depends on the real price through the expected payoff of the risky asset, the firm has no control over it. In other words, the firm does not take account of the effect of its quantity decision on the real price through the expected payoff implicit in the financial price. Hence, the market power is partial, i.e., the firm controls the real price directly through the revenues from the real sector, but not indirectly through the revenues from the financial sector. The reason is that the real price implicit in the financial price through the expected payoff depends upon the beliefs of the investor about the expected payoffs and not the actual choice of the firm. In equilibrium, these beliefs coincide with the choice of the firm. Note that, while the loss of market power changes expected profits, it is not detrimental to shareholders since the expected return of equity share depends on the variance (and

not the mean) of profits. Indeed, any change in expected profits is absorbed by the financial price.

We then study the effect of financial access on the level of output and the distribution of profits. Access to the financial market induces hybrid behavior for a monopolist, that is, a convex combination of monopoly and perfect competition, which results in a loss of market power in the real sector. This loss of market power implies that the monopolist behaves more competitively, which yields a higher level of output, closer to that of the competitive equilibrium in the real sector. Moreover, the allocation of risk among shareholders reduces the cost of risk for the entrepreneur. Indeed, the cost of bearing risk by a privately owned monopolist is higher than the cost of sharing risk among several shareholders in a publicly owned monopolist. The combination of the loss of market power with the spreading of risk implies an increase in both output and risk-taking. In other words, financial access increases the variance of the real profit of the firm.

Finally, financial access alters the relationship between risk-aversion and risk-taking (or the amount of risk undertaken by the firm). This is best seen by studying the effect of risk-aversion of the entrepreneur on the decisions of the firm. Without a financial sector, an increase in risk-aversion induces the firm to decrease output, which decreases the amount of risk (i.e., the variance of real profit) undertaken. However, with financial access, this effect is altered by the link between risk-aversion, ownership structure, and market power. Specifically, a more risk-averse entrepreneur decreases the level of output, and, thus, decreases the variance of the real profit. However, due to the presence of the financial sector, an increase in the entrepreneur's risk aversion induces a higher participation in the financial sector (in order to share risk), which further limits the exercise of market power, i.e., output (and thus the variance of real profit) increases due to a more competitive behavior in the real sector. While these two effects of risk-aversion (loss of market power and reduction of risk) pull in opposite direction, the market power effect is stronger when the real demand is steeper than the financial demand. In that case, an increase in risk-aversion increases risk-taking.

Our work is related to several strands of the literature. First, we study the interplay between the firm and risk-averse shareholders. Previous work has only studied the behavior of risk-averse firms maximizing the expected utility of profit. See [Baron \(1970\)](#) and [Sandmo \(1971\)](#) for the competitive firm, and [Baron \(1971\)](#) for an imperfectly competitive market. [Leland \(1972\)](#) provides a general treatment of a risk-averse firm facing demand uncertainty under both perfect and imperfect competition. See also [Hawawini \(1978\)](#) for a geometric exposition using the mean-variance framework.<sup>2</sup> In this literature, while firms take account of risk, i.e., decision-making is influenced by the riskiness of profits, the effect of financial access on the firms' control over the amount of risk through the market process is absent. Specifically, although risk-averse shareholders have an aversion for risk, their rewards (expected return) depend positively on the amount of risk the firm takes. In other words, the higher the risk premium of an investor, the higher the premium (in terms of expected returns) given to a shareholder to bear part of the risk of the firm. This conflict between shareholders' disdain for risk and the increase in the payment when risk increases impacts real decisions. In other words, merely assuming risk-aversion of the firm without studying the underlying risk-taking process yields results in which the firm takes on less risk, which necessarily reduces how much the investor is rewarded.

<sup>1</sup> This market structure conveys the idea that any publicly traded firm has, in general, less ability to manipulate prices of financial instruments than prices of real goods. Indeed, while a firm can be a monopolist in the real sector due to barriers to entry, the financial market is by nature competitive. For instance, consider two firms, each selling a different product with little substitution or complementarity with the other product. While firms face no competition in the real sector, their respective equity are in fact similar, i.e., each is a claim to profit. Hence, even if they are complementary due to portfolio diversification, there is more competition in the financial market relative to the real market.

<sup>2</sup> The behavior of risk-averse firms facing uncertainty has also been extended to the oligopolistic framework. See [Asplund \(2002\)](#) for a general treatment and references.

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