Polarization, Purpose and Profit

Daniel Ferreira, Radoslawa Nikolowa

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School of Economics and Finance

Queen Mary
University of London

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Daniel Ferreira Radoslawa Nikolowa

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Abstract

We present a model in which firms compete for workers who have a taste for a nonpecuniary job attribute, such as purpose, sustainability, ES/CSR, or working conditions. Firms can invest in flexible production technologies that allow them to create jobs with different levels of the desirable job attribute. In a competitive equilibrium, flexible firms become polarized and cater to workers with extreme preferences for the job attribute. Firm polarization increases with technological progress and industry concentration. More polarized sectors have higher profits, lower average wages, and a lower labor share of value added. Traditional investors prefer to buy shares in polarized sectors, while socially responsible investors prefer to invest in less polarized sectors. Firms in more polarized sectors are more valuable and have higher stock returns than firms in less polarized sectors.

Keywords: Labor Markets; Job Design; Compensating Differentials; Socially Responsible Investment; Polarization

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1 Introduction

Many workers want their jobs to have a higher purpose (e.g., "changing the world," "saving the planet," "helping people," "promoting diversity and equality," etc). Some also care about what the job does and how it is done (e.g., how sustainable their jobs are, how socially responsible the company is, etc.). Purpose, sustainability, social responsibility, and working conditions in general (e.g., flexible working arrangements, health and safety, etc.) are all examples of nonpecuniary job attributes that may be valuable to workers.

An empirical literature shows that workers are willing to pay for desirable job attributes. Sorkin (2018) shows that *compensating differentials* (i.e., wage premiums or discounts that compensate workers for negative or positive nonpecuniary job attributes) account for two-thirds of the firm component of the variance of earnings.[1] Some of these desirable attributes are a consequence of firms' social and environmental decisions or, more generally, their social responsibility stances. Krueger, Metzger, and Wu (2023) find that workers earn nine percent lower wages in firms that operate in more sustainable sectors. In a field experiment, Colonnelli et al. (2023) find that job applicants value ESG characteristics at about ten percent of average wages, which is more than what applicants value most other nonwage amenities.[2] There is also significant heterogeneity in workers' preferences for nonpecuniary job attributes. In a review article, Cassar and Meier (2018) conclude that "*not everyone cares about having a meaningful job (...) heterogeneity in preferences for meaning is substantial.*"[3]

[1]Further evidence of compensating differentials can be found in Stern (2004), Mas and Pallais (2017), Focke, Maug, and Niessen-Ruenzi (2017), Wiswall and Zafar (2018), Sockin (2022), and Ouimet and Tate (2022), among others.

[2]Hedblom, Hickman, and List (2019) find that advertising as a CSR firm increases job application rates by 24%. Similarly, Cen, Qiu, and Wang (2022) find that CSR investments improve employee retention.

[3]Krueger et al. (2023) find that about half of survey participants are willing to accept a wage cut to

We present a model in which firms choose the characteristics of their jobs. Firms compete for workers who have a taste for a nonpecuniary job attribute. We call this attribute *s-quality*. *S*-quality may refer to job purpose or meaning, job sustainability, the ES/CSR attributes of the job, working conditions, or any other positive job attribute that has the following two features. First, while all workers prefer high *s*-quality jobs, workers vary in their willingness to pay for such jobs. Second, some investors (e.g., socially responsible investors) may also have a preference for investing in high *s*-quality firms.

The model has no frictions: competition is perfect, information is symmetric, capital is plentiful, risk sharing is perfect, and there are no agency problems, incentive issues, or financial constraints. We make these assumptions not for realism but, instead, to show that the results are theoretically robust. Thus, the model can be used as a benchmark to assess whether frictions are needed to explain existing or future evidence.

The model is as follows. Some entrepreneurs have access to (or can acquire) technologies that allow them to design jobs of varying *s*-quality levels. We call the firms that use such technologies *flexible firms*. Other entrepreneurs own *inflexible firms*, which are firms that cannot change the *s*-quality of their jobs. Firms compete for workers by offering contracts specifying a wage and an *s*-quality level. While all flexible firms are initially identical, they can differentiate themselves by adopting technologies associated with different *s*-quality levels. A high-quality job is expensive for the firm. For example, if workers prefer jobs that are environmentally sustainable, the firm may choose to adopt low-emission technologies even when they are not cost-efficient.

work for a more environmentally sustainable firm. Colonnelli et al. (2023) document that job applicants' ESG preferences vary with education, ethnic background, and political leanings. Hedblom et al. (2019) find that heterogeneous preferences for CSR cause workers to vary by their propensity to select different jobs. Similarly, Cen et al. (2022) find that more CSR-conscious employees are more likely to quit firms after a reduction in their CSR scores.

Our main result is that, in equilibrium, flexible firms become polarized: they cater to workers with extreme preferences for job quality. That is, flexible firms end up hiring workers with either strong or weak preferences for s-quality; all workers with moderate preferences end up working for inflexible firms.

Firms become polarized in equilibrium because technological flexibility is a real option that allows a firm to tailor their job characteristics to the preferences of their workers. Workers with extreme preferences benefit more from this flexibility. For example, while some workers are willing to accept significant wage cuts to work for more sustainable firms, others may be willing to accept jobs in low-sustainability firms in exchange for high wages. There is fierce competition for workers with extreme preferences because flexible firms can create more value by designing jobs for such workers. In equilibrium, flexible firms cater to the extremes. By contrast, inflexible firms have no choice but to hire workers with moderate preferences.

While increasing s-quality is costly, compensating differentials imply that wages fall with s-quality. Thus, profit and purpose do not always conflict. We show that technological flexibility implies that a firm's profit potential is U-shaped in s-quality. Thus, firms with very high or very low s-quality levels have higher value-added (i.e., profit plus wages).[4]

To consider the determinants of polarization, we solve a parametrized version of the model. We show that firms are more polarized when they become more efficient at producing s-quality. Polarization also increases with labor market concentration and with the

[4]Most papers in the sustainable investment literature assume that CSR/ESG qualities come at the expense of firm cash flows. A notable exception is Pedersen, Fitzgibbons, and Pomorski (2021), who argue that ESG may be positively related to firm profits. Similarly, Edmans (2011) argues that employee satisfaction may be positively associated with long-run cash flows.

dispersion in worker preferences for s-quality. More polarized sectors have higher profits, lower average wages, and a lower labor share of value added.

After modeling the labor market, we introduce financial markets. Entrepreneurs (i.e., those who initially own firms) can choose to sell shares of their firms to outside investors. There are two types of investors: profit-driven investors and socially responsible investors. Profit-driven investors care only about the financial return on their shares. Socially responsible investors are willing to sacrifice some financial gains to invest in companies with high s-quality levels. Socially responsible investors may care about job quality directly because they prefer to invest in companies offering better job conditions. They may also care about job quality indirectly if they share some of their employees' values, such as a concern for sustainability or environmental responsibility.

In equilibrium, profit-driven investors buy shares in firms where workers have either very strong or very weak preferences for s-quality, while socially responsible investors invest in companies where workers have moderate preferences for s-quality. At first glance, this result is counterintuitive. Why wouldn't a socially responsible investor buy shares in companies where workers strongly support social responsibility? The reason is that firms where workers have extreme preferences for s-quality have more *profit potential* than firms where workers are more moderate. This profit potential attracts profit-driven investors, who have a comparative advantage in investing in high-profit companies. These investors chase returns and, ultimately, earn zero abnormal returns due to competition. They crowd out socially responsible investors, who have a comparative advantage in investing in low-profit firms.

The model delivers several empirical predictions. In particular, the model predicts that firms should be on average more valuable in polarized sectors, i.e., sectors with high cross-sectional dispersion in s-quality levels (e.g., ESG, sustainability, or similar scores). Such sectors should also display high stock returns. In addition, the model generates cross-section relationships between employee satisfaction, firm value, and stock returns. While the link between employee satisfaction and stock returns does not need to be monotonic, the model implies that firms with the highest levels of employee satisfaction also deliver the highest returns. Similarly, firms with the lowest levels of employee satisfaction have the lowest returns. Edmans (2011) shows evidence that employee satisfaction is positively related to stock returns. His explanation is that the market does not fully recognize the value of intangibles. Our model provides an alternative explanation that does not require any friction or mispricing. This is not to say that frictions cannot explain some (or even all) of the evidence. Rather, the model illustrates that a link between employee satisfaction and stock returns can arise even if there are no frictions. Edmans, Pu, Zhang, and Li (2023) show that the positive link between employee satisfaction and stock returns is stronger in countries with flexible labor markets. This finding is also consistent with our model of competition in a frictionless labor market.

Our model predicts firm polarization as an equilibrium outcome. Polarization may occur for any characteristic that employees value. An emerging empirical literature study firm polarization in social and political stances. Di Giuli and Kostovetsky (2014) find an association between stakeholders' political views and firms' CSR policies. Conway and Boxell (2023) show that firms' public stances on controversial social issues align with the preferences of their consumers and employees. Giannetti and Wang (2023) show that heterogeneity in corporate cultures explains differences in corporate reactions to heightened public attention to gender equality. Colonnelli, Pinho Neto, and Teso (2022), Fos, Kempf, and Tsoutsoura (2023), and Duchin et al. (2023) analyze some of the economic consequences of firm political polarization.

After a brief review of the related theoretical literature (Section 2), we present our model of the labor market in Section 3 and derive our main findings. In Section 4, we present additional empirical predictions and model extensions. Section 5 concludes. All proofs are in the Appendix.

2 Related Literature

While the empirical literature on compensating differentials is vast, there are few works on the theory of compensating differentials. Our model is inspired by Rosen (1986), who models firms that compete by offering bundles of wages and nonwage attributes (see Lavetti (2023) for a recent review of the Rosen framework). By imposing further structure to Rosen's general framework, we are able to solve for the equilibrium fully and derive testable predictions. In addition, we extend the model to incorporate investors. In the Internet Appendix, we extend the model dynamically to consider careers inside firms, following Ferreira and Nikolowa (2024). We then derive additional predictions relating technological parameters to worker turnover and within-firm inequality.

Our paper is also related to a small theoretical literature on the impact of organization and job design on labor market sorting. Aghion and Tirole (1997) show that delegation of decision rights benefits firms through the agent's participation decision because agents who value autonomy are willing to work for lower compensation. Van den Steen (2005) shows that firms may wish to appoint CEOs with a particular "vision" to attract employees who share such a vision. A shared vision is modeled as shared beliefs in a world of multiple priors. Firms benefit from committing to a vision in multiple ways, such as improved motivation, coordination, and lower compensation costs. Van den Steen (2010) extends the analysis and broadens the interpretation of shared vision to include shared values (i.e., similar preferences). More closely related to our model is Henderson and Van den Steen's (2015) analysis of purposeful firms. In their model, firms commit to a pro-social purpose to attract employees who wish to develop a reputation for being pro-socially minded. In related work, Song, Thakor, and Quinn (2023) develop a model in which firms and workers are heterogeneous in their preferences for firm purpose. In a search model, they show that firms that offer a higher purpose can save on wage costs by matching with workers with strong purpose preferences. In these models, as in our model, firms that adopt a purpose can be more profitable because employees accept to work for lower wages. In a more recent contribution to this literature, Geelen, Hajda, and Starmans (2022) develop a delegation model of an organization in which controlling and non-controlling stakeholders can have pro-social preferences.

Our model features agents with preferences over nonpecuniary firm attributes in a frictionless competitive environment. A similar approach is found in a strand of the literature on responsible investment, which modifies standard asset pricing models to allow some investors to have social preferences (Heinkel, Kraus, and Zechner (2001); Pástor, Stambaugh, and Taylor (2021); Berk and van Binsbergen (2022)). Despite the absence of frictions, these models deliver many insights. In a sense, our model is the labor market counterpart of these asset market models. While in the asset pricing literature the key scarce resource is capital, in our model the scarce resource is labor. Other related competitive models with few frictions (but no labor markets) include those of Pedersen, Fitzgibbons, and Pomorski (2021), who develop a mean-variance analysis of responsible investing when some investors are unaware of the informational content of ESG scores, Goldstein et al. (2022), who consider a rational expectations equilibrium model of stock prices when information about cash flow and ESG risk is dispersed among atomistic investors (who can be either green or traditional investors), and Landier and Lovo (2023), who present a general equilibrium model of responsible investing in which the matching between entrepreneurs and capital is subject to frictions.

More generally, our paper is related to the theoretical literature on socially responsible investing. A vast literature has developed since the pioneering work of Heinkel, Kraus, and Zechner (2001); for brevity, we review only the papers that share some of our modeling choices and applications. Most papers in this literature assume that some firms have technological flexibility. For example, Chowdry, Davies, and Waters (2019) consider a model of impact investing in which a manager allocates a scarce resource (e.g., attention) between a for-profit technology and a social technology. Oehmke and Opp (2022) present a corporate-finance model of socially responsible investing in which an entrepreneur chooses between two productive technologies—clean and dirty—and then raises funds from investors that can be either purely financially motivated or socially responsible. Broccardo, Hart, and Zingales (2022) consider a model in which some agents care about the welfare of those affected by a decision. They show how investor voice (i.e., voting) can have an impact when investors are socially responsible. Edmans, Levit, and Schneemeier (2023) present a model in which a firm can take costly corrective actions to reduce externalities. They compare different forms of divestment strategies by responsible investors (blanket exclusion versus tilting). Piatti, Shapiro, and Wang (2023) consider a model in which some investors care about public good provision. Those investors invest more in firms delivering the public good (green firms) and may also invest more in brown firms for hedging reasons.

In addition, many models of sustainable investing consider the interactions between financial markets and corporate insiders, such as employees and managers. Davies and Van Wesep (2018) show that divestment campaigns can backfire because executive compensation typically rewards stock *returns*, not prices. Bond and Levit (2022) develop a model of imperfect competition in labor markets where an ESG policy is a commitment to pay workers above the market wage. In a similar vein, Stoughton, Wong, and Yi (2020) and Xiong and Yang (2023) model CSR as a commitment device, for firms with market power, to consider consumer or employee interests. In Albuquerque, Koskinen, and Zhang (2019), firms that adopt a CSR technology directly impact the consumers' demand by decreasing the elasticity of substitution. Thus, the adoption of a CSR technology decreases profit sensitivity to aggregate productivity shocks. Bisceglia, Piccolo, and Schneemeier (2022) present a model in which ex-ante identical firms can choose between two different technologies—brown and green—and a fraction of their customers and investors may have socially responsible preferences. Bucourt and Inostroza (2023) consider a setup where a manager exerts costly effort to increase the firm's ES quality, and heterogeneous investors trade shares based on their beliefs about the firm's ES quality. The authors show investor heterogeneity reduces the firm's ES investments.

3 Model

3.1 Technology and Preferences

We consider an economy with two types of firms, $\iota \in \{0,1\}$. We call such types *sectors*. Each sector has a continuum of mass F_ι of firms. Each firm is initially owned by a profit-maximizing entrepreneur. Thus, F_0 and F_1 are also the masses of entrepreneurs in each sector. Each firm can hire one worker. If a firm of type ι employs one worker, it generates revenue $y_\iota > 0$. A firm can choose its s-quality level, $s \in [\underline{s}_\iota, \overline{s}_\iota]$, which we also call the *s-attribute*, at cost $c_\iota(s)$ to the firm. We can interpret s as the choice of a technology that generates $y_\iota - c_\iota(s)$ as earnings before wages. We assume $c'_\iota > 0, c''_\iota > 0$, and $c_\iota(0) = c'_\iota(0) = 0$, the latter being an Inada condition to avoid corner solutions. A firm's profit is thus $\pi_\iota(s,w) = y_\iota - c_\iota(s) - w$, where w is the wage per worker. For simplicity, we impose no constraints on w; the qualitative results are unchanged if w is constrained to be non-negative (alternatively, we can interpret our analysis as the case in which non-negative wage constraints do not bind).

From now on we set $y_0 = y_1 =: y$ and $c_0(s) = c_1(s) =: c(s)$, unless explicitly noted otherwise. This assumption is inconsequential for our core results, but it simplifies the notation and helps with the intuition by eliminating most of the heterogeneity across sectors. The only remaining difference between the two sectors is the flexibility of their production technologies. We assume that Sector 1 is more flexible than Sector 0: $[\underline{s}_0, \overline{s}_0] \subset (\underline{s}_1, \overline{s}_1)$. To simplify the analysis, for the remainder of the paper, we assume that Sector 0 is completely inflexible: $\underline{s}_0 = \overline{s}_0 =: s_0$, while Sector 1 is perfectly flexible, that is, $\underline{s}_1 = 0$ and $\overline{s}_1 = \infty$. Thus, we refer to Sector 1 as the *flexible sector* and Sector 0 as the *inflexible sector*.

Our interpretation is that each s indexes a production technology, with technologies with higher s delivering lower earnings before wages, $y - c(s)$. While Sector 1 firms can choose any technology $s \geq 0$ they want, Sector 0 firms are stuck with technology s_0.

Labor supply in the economy is inelastic with a continuum of mass L of agents. To keep the analysis general, we consider F_ι as exogenous for most of the paper. We make the following parametric assumption:

Assumption 1. $F_1 \leq L < F_0 + F_1$.

That is, we assume that agents are in short supply relative to the overall number of jobs in the economy. We focus our discussion on the more interesting case, in which there is an active inflexible sector (i.e., $F_1 < L$). However, our results also hold for $F_1 = L$. In Subsection 4.3, we consider the alternative case in which agents are in excess supply: $L \geq F_0 + F_1$. In Subsection 4.5, we endogenize F_ι by introducing an ex-ante stage when entrepreneurs decide whether to pay entry cost K_ι to create a firm of type ι.

Agents enjoy utility $u(C)$ over "consumption" $C \geq 0$, with $u' > 0$, $u'' < 0$, and $\lim_{C \to 0} u'(C) = \infty$, the latter being an Inada condition to avoid corner solutions. An agent uses two inputs—wages and the s-attribute—to "produce" consumption according to $C(s, w) = \varepsilon + \alpha s + (1 - \alpha) w$, where $\alpha \in (0, 1)$ measures the agent's relative taste for the s-attribute and $\varepsilon > 0$ is an exogenous (monetary) endowment. To save on notation, we let the utility function "absorb" parameter ε, which is equivalent to setting $\varepsilon = 0$. Agents are heterogeneous in their preferences for the s-attribute. There are n types of agents, with $\alpha \in \{\alpha_1, ..., \alpha_n\}$, with $\alpha_i < \alpha_{i+1}$. Let p_i denote the proportion of type i in the population. That is, $p_i L$ is the mass of agents of type i. We initially work with a finite number of types to keep the equilibrium conditions simple and intuitive. Later, we extend the analysis to a continuum of agent types.

3.2 Benchmark: Efficient Contracts

In this subsection, we characterize the set of efficient contracts between a worker and a flexible firm. Such contracts serve as a benchmark for assessing the efficiency properties of the equilibrium contracts that we will describe in the next subsection.

Suppose a flexible firm matches with a worker of type i. We assume that the firm (i.e., the entrepreneur) and the worker jointly agree on a contract (s, w). Let $\pi(s, w)$ denote the firm's profit. If worker i accepts to work for the flexible firm, her consumption is $C_i(s, w)$. We use $C_0 > 0$ to denote the agent's outside consumption if she works for an inflexible firm instead.

If contract (s, w) is efficient, then it must maximize a weighted sum of the surpluses of the worker and the entrepreneur for some weight $\omega \in [0, 1]$. We interpret ω as the worker's relative bargaining power. The *match surplus* is:

$$\begin{aligned} V(\alpha_i, \omega, C_0) := \ & \max\nolimits_{s,w} \omega \left[u(C_i(s, w)) - u(C_0)\right] + (1 - \omega)\pi(s, w) \\ & \text{s.t. } C_i(s, w) \geq C_0 \text{ and } \pi(s, w) \geq 0 \end{aligned} \tag{1}$$

Any Pareto-efficient contract (s, w) is associated with a value for the match surplus $V(\alpha_i, \omega, C_0)$ for some $\omega \in [0, 1]$. Thus, changing ω allows us to trace the Pareto set of all efficient contracts. The next result characterizes the Pareto set (all proofs not in text are in the Appendix).

Lemma 1 (Efficient Contracts). *For given (α_i, C_0), contract (s_i^*, w_i^*) is efficient if and only if*

$s_i^* = h(\alpha_i) := c'^{-1}\left(\frac{\alpha_i}{1-\alpha_i}\right)$ *and, for some for* $\omega \in [0,1]$,

$$w_i^* = \min\left\{\frac{\max\{g(\alpha_i,\omega), C_0\} - \alpha_i h(\alpha_i)}{1-\alpha_i}, y - c(h(\alpha_i))\right\},$$

where $g(\alpha_i,\omega) := u'^{-1}\left(\frac{1-\omega}{\omega(1-\alpha_i)}\right)$ *for* $\omega \in (0,1)$, $g(\alpha_i, 0) = 0$ *and* $g(\alpha_i, 1) = \infty$.

Lemma 1 shows that, while there are multiple efficient contracts for given (α_i, C_0), the efficient quantity of the s-attribute is unique for a given α_i and independent of C_0. The uniqueness of s_i^* results from two properties of technology and preferences: (i) the profit function is quasi-linear and (ii) the agents' indifference curves are linear. Property (i) is a consequence of the convexity of $c(.)$, thus it is both natural and general. While property (ii) is not general (or realistic in several cases), it can be interpreted as a linear approximation to convex indifference curves, which are quite general. Because of the convexity of $c(.)$, the tangency between isoprofits and linear indifference curves happens at interior values of (s, w), where the linear approximation interpretation is more easily justified.

The next result describes the shape of the match surplus function:

Proposition 1 (Match Surplus). *The match surplus* $V(\alpha_i, \omega, C_0)$ *is strictly U-shaped in* α_i.

The shape of the match surplus function is the main force behind our results below. Thus, it is instructive to sketch the intuition for the proof of this result (the formal proof is in the Appendix). Suppose that for given ω both the firm and the worker enjoy a strictly positive surplus. Then, by the Envelope Theorem, we have:

$$\frac{\partial V(\alpha_i, \omega, C_0)}{\partial \alpha_i} = \omega u'(C_i^*)(s_i^* - w_i^*), \tag{2}$$

which implies that V is decreasing for $s_i^* < w_i^*$ and increasing for $s_i^* > w_i^*$. Because the efficient s-attribute level increases with α_i while wages decrease with α_i, (2) implies that V is U-shaped in α_i.

This result is economically meaningful. It implies that flexible firms create more surplus when they match with workers with extreme preferences. To understand the intuition, note that the flexible technology is a real option: it allows firms to create value by adapting to the preferences of their workers. The value of the option increases with the distance between the default position (i.e., the inflexible-sector contract) and the flexible contract. Workers with intermediate preferences for the s-attribute have the lowest surplus because the flexible sector cannot improve much upon the inflexible contract. The extreme types, on the other hand, value flexibility more. Thus, the flexible sector creates more value by catering to the preferences of the extreme types.

Proposition 1 extends to cases in which C_0 depends on the worker type. Let (s_0, w_0) denote the contract offered by an inflexible firm. Then, $C_0 = w_0 + \alpha_i(s_0 - w_0)$. The relevant case for our analysis is when the agent's participation constraint is binding, i.e., the case in which $\omega = 0$. In that case, the match surplus $V(\alpha_i, 0, w_0 + \alpha_i(s_0 - w_0))$ is the maximum profit a flexible firm could extract from a worker of type α_i whose outside option is to work for an inflexible firm. That is, $V(\alpha_i, 0, w_0 + \alpha_i(s_0 - w_0)) = \pi\left(h(\alpha_i), w_0 + \frac{\alpha_i}{1-\alpha_i}(s_0 - h(\alpha_i))\right)$. We thus call $v(\alpha_i) := V(\alpha_i, 0, w_0 + \alpha_i(s_0 - w_0))$ the *profit potential*. The profit potential is the actual profit that a monopolist firm would enjoy if matched with a worker of type α_i. We have the following result:

Proposition 2 (Profit Potential). *The profit potential $v(\alpha_i)$ is strictly U-shaped in α_i.*

Because s_i^* is increasing in α_i, Proposition 2 implies that the profit potential is also U-shaped in "purpose," i.e., s_i^*. Intuitively, by offering jobs with higher s-quality, the firm pays higher direct costs but can also pay lower wages. We observe a U-shaped pattern because the firm can create (and thus extract) more surplus when matched with workers with extreme preferences.

3.3 Competitive Equilibrium

We now consider a competitive equilibrium involving all firms and agents. We assume that the entrepreneur consumes the firm's profit at the end of the period. In Subsection 4.4, we consider the case in which the entrepreneur can instead sell shares to outside investors.

Suppose a firm in the flexible sector wishes to hire an agent of type α_i. The agent agrees to work for the firm only if the firm offers her a contract that is no worse than what she could get elsewhere. Suppose the worker can obtain consumption C_i by working for other firms. Perfect competition means that the firm takes this consumption level as given. To maximize its profit, the firm must choose a contract (s, w) that minimizes the cost of providing utility $U(C_i)$ to the worker:

$$\min_{s,w} c(s) + w \text{ subject to } \alpha_i s + (1-\alpha_i)w = C_i. \tag{3}$$

Solving (3) yields $s_i^* = h(\alpha_i)$ and $w_i(C_i) = \frac{C_i - \alpha_i h(\alpha_i)}{1-\alpha_i}$. Thus, all agents of type i must have the same s_i^* as in Lemma 1, which is the efficient level of the s-attribute for that type. In addition, all agents of type i must have the same w_i.[5] Cost minimization thus implies that there are at most n flexible-sector contracts (w_i, s_i) that could be accepted by some

[5]Suppose not, then a firm that hires an agent with $C_i' > C_i$ would rather hire an agent of the same type but with C_i. Thus, the firm would be willing to pay $w_i + \epsilon > 0$ to hire that agent, which constitutes a profitable deviation.

workers in equilibrium. In such contracts, $s_i = s_i^*$.

We model perfect competition by assuming that all firms and workers take the set of contracts as given, each firm picks one contract from this set to maximize its profit, and workers choose to apply to firms that offer the best contracts for their types. Let $\mathbf{w} = (w_0, ..., w_n)$ denote a vector of wages, where w_0 is the wage in the inflexible sector and $(w_1, ..., w_n)$ are the wages in the flexible sector. When referring to such wages, we call each index $j \in \{0, 1, ..., n\}$ a *market*. Let

$$A(\mathbf{w}) := \arg \max_{j \in \{0,1,...,n\}} \pi(s_j^*, w_j) \text{ subject to } \pi(s_j^*, w_j) \geq 0. \tag{4}$$

That is, $A(\mathbf{w})$ is the set of indices $j \in \{0, 1, ..., n\}$ representing the markets that offer the highest (non-negative) profit to firms given the vector of wages $\mathbf{w}$. We can then define the flexible firms' *labor demand correspondence* for market j as

$$D_j(\mathbf{w}) := \begin{cases} F_1 & \text{if } \{j\} = A(\mathbf{w}) \\ 0 & \text{if } \{j\} \not\subseteq A(\mathbf{w}) \\ [0, F_1] & \text{if } \{j\} \subset A(\mathbf{w}), \end{cases} \tag{5}$$

where $\subset$ denotes a proper subset. That is, if only market j offers the highest profit, all F_1 firms will demand workers of type j. If market j is not a profit-maximizing market, labor demand in that market will be zero. If there are multiple markets with the same maximal profit, firms will be indifferent among these markets. Similarly, define the labor demand correspondence for inflexible firms as

$$D_0(w_0) := \begin{cases} F_0 & \text{if } \pi(s_0, w_0) > 0 \\ 0 & \text{if } \pi(s_0, w_0) < 0 \\ [0, F_0] & \text{if } \pi(s_0, w_0) = 0. \end{cases} \tag{6}$$

Note that $D_0(w_0)$ denotes the inflexible firms' labor demand, while $D_0(\mathbf{w})$ is the flexible firms' demand in market $j = 0$. That is, flexible firms can also offer the inflexible firms' contract if they wish. We can then define

$$B_i(\mathbf{w}) := \arg \max_{j \in \{0,1,...,n\}} C_i(s_j^*, w_j). \tag{7}$$

That is, $B_i(\mathbf{w})$ is the set of indices $j \in \{0, 1, ..., n\}$ representing the contracts that offer the highest consumption to workers of type i. We can then define worker i's *labor supply correspondence* for market j as

$$S_{ij}(\mathbf{w}) := \begin{cases} p_i L & \text{if } \{j\} = B_i(\mathbf{w}) \\ 0 & \text{if } \{j\} \not\subseteq B_i(\mathbf{w}) \\ [0, p_i L] & \text{if } \{j\} \subset B_i(\mathbf{w}). \end{cases} \tag{8}$$

An equilibrium is characterized by a set of vectors of wages and quantities $(\mathbf{w}^*, \mathbf{x}_1^*, ..., \mathbf{x}_n^*)$, where $\mathbf{x}_i = (x_{i0}, x_{i1} ..., x_{in})$ are non-negative values. Quantity x_{i0} is the mass of workers of type i employed in the inflexible sector, and $(x_{i1} ..., x_{in})$ are the masses of workers of type i employed in each flexible market $j = 1, ..., n$. A *competitive equilibrium* is defined by the following supply and demand conditions:

(i) The mass of workers employed in each market must belong to the demand correspondence for that market:

$$\sum_{i=1}^{n} x_{i0}^{*} \in D_0(w_0^*) \cup D_0(\mathbf{w}^*),$$

and

$$\sum_{i=1}^{n} x_{ij}^{*} \in D_j(\mathbf{w}^*) \text{ for all } j \in \{1, ..., n\}.$$

(ii) The mass of workers of type i employed in each market must belong to i's supply correspondence for that market:

$$x_{ij}^{*} \in S_{ij}(\mathbf{w}^*) \text{ for all } i \in \{1, ..., n\} \text{ and } j \in \{0, ..., n\}.$$

(iii) Workers need to work in one of the two sectors (i.e., labor supply is inelastic):

$$\sum_{j=0}^{n} x_{ij}^{*} = p_i L, \text{ for all } i \in \{1, ..., n\}.$$

(iv) Total employment must not be greater than aggregate labor demand:

$$\sum_{j=1}^{n} \sum_{i=1}^{n} x_{ij}^{*} \leq F_1 \text{ and } \sum_{i=1}^{n} x_{i0}^{*} + \sum_{j=1}^{n} \sum_{i=1}^{n} x_{ij}^{*} \leq F_0 + F_1.$$

Before discussing the characteristics of the equilibrium, we first introduce some concepts and notation. In equilibrium, only workers of type j may accept contract j (we can always define contract j so that this is true). To simplify notation, we denote the equilibrium employment in market j by x_j^*. If $x_j^* > 0$, we say that market j is *active* in equilibrium.

Also, define α_k such that $s_0 = h(\alpha_k)$. That is, α_k is the type for which the inflexible job quality level s_0 is optimal. Without loss of generality, we assume that $p_k \in (0, \epsilon)$, i.e., there is a positive but arbitrarily small ($\epsilon \to 0$) mass of workers of type α_k.

The next lemma is a consequence of profit equalization in competitive markets:

Lemma 2 (Profit Equalization). *In equilibrium, firms in the inflexible sector have zero profit (i.e., $\pi(s_0, w_0^*) = 0$) and firms in the flexible sector have strictly positive profit, $\pi(s_j^*, w_j^*) = \pi^* > 0$ for all $j \in \{1, ..., n\}$ such that $x_j^* > 0$.*

Lemma 2 implies that profits are the same across all active markets in the flexible sector. That is, in the cross-section of flexible firms, there is no relation between profit and the s-attribute. Lemma 2 also implies that $w_0^* = y - c(s_0)$.

Note that the profit potential is $v(\alpha_i) = \pi\left(s_i^*, \frac{C_i(s_0, y - c(s_0)) - \alpha_i s_i^*}{1 - \alpha_i}\right)$. Proposition 2 implies that $v(\alpha_i)$ is strictly U-shaped and reaches its minimum value for $\alpha = \alpha_k$. Thus, for each $j \in \{1, ..., k\}$, there exists at most one $j' > k$ such that $v(\alpha_j) = v(\alpha_{j'})$. For expositional simplicity, we make the following assumption:

Assumption 2. *There is no pair $(j, j') \in \{1, ..., n\}^2$ for which $v(\alpha_j) = v(\alpha_{j'})$.*

This assumption allows us to rule out measure-zero cases in which the equilibrium may not be unique, but otherwise, it is not important for the results.[6] We prove the existence of a unique equilibrium in the next proposition:

Proposition 3 (Existence and Uniqueness). *A competitive equilibrium exists. Under Assumptions 1 and 2, there exists a unique type $z \in \{1, ..., n\}$ such that the equilibrium quantities are*

[6]Note also that Assumption 2 becomes irrelevant if the distribution of worker types is continuous.

$x_0^* = L - \sum_{j=1}^{n} x_j^*$ and

$$x_j^* = \begin{cases} p_j L & \text{if } v(\alpha_j) > v(\alpha_z) \\ 0 & \text{if } v(\alpha_j) < v(\alpha_z) \\ F_1 - \sum_{j \in \{j \neq z : x_j^* > 0\}} p_j L & \text{if } j = z \end{cases} \tag{9}$$

for $j \in \{1, ..., n\}$. The equilibrium wages are $w_0^* = y - c(s_0)$ and

$$w_j^* = \begin{cases} y - c(s_j^*) - v(\alpha_z) & \text{if } x_j^* > 0 \\ w \in \left[y - c(s_j^*) - v(\alpha_z), \frac{C_j(s_0, w_0^*) - \alpha_j s_j^*}{1 - \alpha_j} \right] & \text{if } x_j^* = 0 \end{cases} \tag{10}$$

for $j \in \{1, ..., n\}$.

We note that uniqueness here means unique quantities in each market. Wages are also unique in all active markets (i.e., where $x_j^* > 0$).[7]

3.4 Equilibrium properties

In this subsection, we present some of the characteristics of the equilibrium. The first is our main result:

Corollary 1 (Polarization). *The equilibrium is polarized: flexible firms cater to the most extreme preferences. Formally, if $j \in \{2, k-1\}$, $x_j^* > 0$ implies $x_{j-1}^* = p_{j-1} L$. If $j \in \{k+1, n-1\}$, $x_j^* > 0$ implies $x_{j+1}^* = p_{j+1} L$.*

[7] To simplify the exposition, we ignore the measure-zero case in which $F_1 = \sum_{j \in \{j : x_j^* > 0\}} p_j L$. In this case, w_z^* may be anywhere in $\left[\frac{C_j(s_0, w_0^*) - \alpha_j s_j^*}{1 - \alpha_j}, y - c(s_j^*) - \widehat{v} \right]$, where $\widehat{v} = \max_{j \in \{j : v(\alpha_j) < v(\alpha_z)\}} v(\alpha_j)$.

This corollary implies that there is no equilibrium where employees with moderate preferences (i.e., employees with type α_k, the central type) are employed in the flexible sector. Because flexible firms cater to those with extreme preferences, in equilibrium, flexible firms are polarized. That is, flexible firms are more extreme than the underlying population preferences for the s-attribute. This result is important because Lemma 2 implies that flexible firms are also the most profitable (and thus more valuable) firms. Thus, empirically, Corollary 1 implies that firms in the most valuable and profitable sectors will display more dispersion in s-quality levels.

The next result confirms that wages fall with the s-attribute:

Corollary 2 (Compensating Differentials). *The equilibrium displays compensating differentials: for $j' > j$, if $x_j^* > 0$ and $x_{j'}^* > 0$, then $s_j^* < s_{j'}^*$ and $w_j^* > w_{j'}^*$.*

In the cross-section, firms with higher levels of the s-attribute offer lower wages to their employees.

The next corollary summarizes the equilibrium welfare implications for workers:

Corollary 3 (Consumption Inequality). *In the flexible sector, workers with extreme preferences have higher consumption levels: There exists $\hat{\alpha}$ such that if $\alpha_i < \hat{\alpha}$, $C_{i-1}^* \geq C_i^*$, and if $\alpha_i > \hat{\alpha}$, $C_{i+1}^* \geq C_i^*$.*

That is, in equilibrium, workers with extreme preferences benefit more from working in the flexible sector than workers with more moderate preferences toward the s-attribute. Workers in jobs with a higher level of equilibrium consumption have a higher willingness to pay to keep their jobs. Thus, Corollary 3 implies that employee satisfaction is higher in firms with extreme levels of the s-attribute.

3.5 Comparative Statics

Corollary 1 implies the existence of two groups of flexible firms in equilibrium: high-s firms (firms in which $s_j^* > s_0$) and low-s firms (firms in which $s_j^* < s_0$). We define the *degree of firm polarization* as $\rho = s^h - s^l$, where s^h is the minimum s among high-s firms and s^l is the maximum s among low-s firms. The degree of firm polarization is a potentially observable equilibrium outcome. Thus, we use it as one of the outcome variables in our comparative statics exercises.

It is more convenient to perform comparative statics in the limiting case in which there is a continuum of types distributed according to $P(.)$, with density $p(.)$. In this case, there are no differences between types and indices, thus, we denote a type by $\alpha \in (0, 1)$. The equilibrium is then defined by equating supply and demand:

Corollary 4 (Equilibrium under Continuous Types). *If the distribution of types, $P(.)$, is continuous, then the equilibrium is given by a unique type $z \in (k, 1)$ such that*

$$F_1 = L\left(\int_0^{\phi(z)} p(\alpha)d\alpha + \int_z^1 p(\alpha)d\alpha\right) \tag{11}$$

where $\phi(\alpha) : (k, 1) \to [0, k]$ is defined as

$$\phi(\alpha) := \alpha' \text{ such that } \max_{\alpha' \in [0,k]} v(\alpha') \leq v(\alpha). \tag{12}$$

Because the equilibrium is such that only the extreme types work in the flexible sector, there are two thresholds: $z \in (k, 1)$ and $\phi(z) \in [0, k]$. In an interior equilibrium, we have $v(z) = v(\phi(z)) = \pi(z)$, where $\pi(z)$ is the equilibrium profit of the firms in the flexible sector. All types $\alpha \leq \phi(z)$ and $\alpha \geq z$ are employed in the flexible sector. The equilibrium degree of polarization is $\rho = s_z^* - s_{\phi(z)}^*$.

We now consider the effect of a change in the distribution of workers' preferences for the s-attribute on firm polarization, profits, and wages. Mas-Colell et al. (1995, p.198) define an elementary increase in risk as follows: "$G(.)$ *constitutes an elementary increase in risk from* $F(.)$ *if* $G(.)$ *is generated from* $F(.)$ *by taking all the mass that* $F(.)$ *assigns to an interval* $[x', x'']$ *and transferring it to the end-points* x' *and* x'' *in such a manner that the mean is preserved.*" We generalize the notion of increase in risk and say that $\widehat{P}(.)$ is a *generalized increase in risk* from $P(.)$ if $\widehat{P}(.)$ is generated from $P(.)$ by taking some of the mass that $P(.)$ assigns to an interval $[x', x'']$ and transferring it to points smaller than x' and greater than x'' in such a manner that the mean is preserved. Formally, $\widehat{P}(.)$ is a generalized increase in risk from $P(.)$ if (i) $\int_{x'}^{x''} p(\alpha)d\alpha > \int_{x'}^{x''} \hat{p}(\alpha)d\alpha$ and (ii) $\int_0^1 \alpha p(\alpha)d\alpha = \int_0^1 \alpha\hat{p}(\alpha)d\alpha$. It is immediate that a generalized increase in risk is a mean-preserving spread (and thus $P(.)$ second-order stochastically dominates $\widehat{P}(.)$). Then, we have the following result:

Proposition 4 (Generalized Increase in Risk). *If* $\widehat{P}(.)$ *is a generalized increase in risk from* $P(.)$ *for* $x' = \phi(z)$ *and* $x'' = z$*, then the equilibrium under* $\widehat{P}(.)$*:*

i) is more polarized than that under $P(.)$*, that is,* $\widehat{\rho} > \rho$*,*

ii) has higher profits than under $P(.)$*, that is,* $\pi(\hat{z}) > \pi(z)$*,*

iii) has lower wages than under $P(.)$*, that is,* $\widehat{w}^*(\alpha) < w^*(\alpha)$*.*

An increase in risk implies that more workers have extreme preferences for the s-attribute (either high or low α). Since the flexible technology is more valuable to workers with extreme preferences, flexible firms would cater to those workers, thus becoming more polarized in their provision of the desirable attribute. Profits increase and wages fall because workers with extreme preferences—which are the most valuable to firms—are now less scarce.

Next, we consider the effect of a simple regulatory proposal, such as a minimum requirement for s. For example, regulators can impose a minimum environmental standard, require a minimum provision of workplace amenities, or impose a minimum quota on workforce diversity. Let $\tilde{s}$ be the minimum s-quality requirement. We assume that the requirement is binding only for low-s firms.

Proposition 5 (**Minimum standards**). *Let z denote an unconstrained equilibrium. If a minimum standard $\tilde{s} \in \left(s^*_{\phi(z)}, s_0\right)$ is introduced, then the new equilibrium, $\tilde{z}$, is such that $\tilde{z} < z$, $\pi(\tilde{z}) < \pi(z)$, and $\tilde{w}^*(\alpha) > w^*(\alpha)$ for $\alpha > \tilde{z}$.*

The introduction of a binding minimum standard implies that low-s firms can no longer offer the efficient levels of the s-attribute to workers with low-s preferences. This constraint leads to a decrease in the equilibrium profits of all flexible firms. High-s workers benefit from the introduction of $\tilde{s}$ because they now earn higher wages and consume more. The next corollary describes the effect of the introduction of a minimum standard on the average s level in the flexible sector.

Corollary 5 (**Minimum Standards and Average S-Quality**). *The minimum standard increases the average s in the flexible sector by*

$$\int_0^{\tilde{\phi}(z)} (\tilde{s} - s_\alpha) p(\alpha) d\alpha + \int_{\tilde{z}}^{z} s_\alpha p(\alpha) d\alpha - \int_{\phi(z)}^{\tilde{\phi}(\tilde{z})} s_\alpha p(\alpha) d\alpha. \tag{13}$$

As expected, the introduction of a binding minimum standard leads to an increase in the average s level in the flexible sector. However, the low-s firms' reaction to introducing a minimum standard is heterogeneous. Some firms adjust on the intensive margin by increasing their s levels to meet the minimum standard (i.e., $\tilde{s}$). This effect is measured by $\int_0^{\tilde{\phi}(z)} (\tilde{s} - s_\alpha) p(\alpha) d\alpha$. Other firms adjust on the extensive margin by becoming high-s firms. This effect is measured by $\int_{\tilde{z}}^{z} s_\alpha p(\alpha) d\alpha - \int_{\phi(z)}^{\tilde{\phi}(\tilde{z})} s_\alpha p(\alpha) d\alpha$. As more firms now choose to locate at the high-s end, high-s workers benefit from an increase in the demand for their types.

4 Empirical Predictions and Extensions

This section builds upon the core results of the previous section by establishing further empirical predictions and presenting model extensions. We begin by presenting a parametric version of the model, which we use to illustrate the main equilibrium properties and derive additional testable predictions. Using this model, in Subsection 4.2 we present results linking the degree of firm polarization to the labor share of a sector's income. In Subsection 4.3, we then consider the case in which workers are in excess supply. In Subsection 4.4, we let entrepreneurs sell shares to outside investors and derive implications for stock returns. Finally, in Subsection 4.5, we model the ex-ante investments entrepreneurs undertake to create new firms (i.e., we endogenize the number of firms in each sector).

4.1 A Fully Solvable Model

Proposition 3 and Corollary 4 show how to find the equilibrium for any distribution $P(.)$ and cost function $c(.)$. Here, we consider a parametric version of the model that allows for an analytical solution in closed form. Because it is analytically more convenient to work with the transformed type $a := \frac{\alpha}{1-\alpha}$, from now on, we refer to a as the worker's type. We assume that a is uniformly distributed on $[a' - \Delta, a' + \Delta]$, for an arbitrary $a' \geq \Delta > 0$.[8] Parameter Δ measures the dispersion of preferences for s around the mean a'. We also assume that the cost function is quadratic: $c_\iota(s) = \frac{\sigma_\iota s^2}{2}$, for $\iota \in \{0, 1\}$.[9] We call this set of assumptions the *quadratic-uniform case*, for short.

We now use our previous results to characterize the equilibrium. Zero profit in the inflexible sector (Lemma 2) implies $w_0^* = y - \frac{\sigma_0 s_0^2}{2}$. The optimal level of the s-attribute in the flexible sector is $h(\alpha) = \frac{a}{\sigma_1}$. The profit potential as a function of a is $v(a) = y - w_0^* - as_0 + \frac{a^2}{2\sigma_1} = \frac{\sigma_0 s_0^2}{2} - as_0 + \frac{a^2}{2\sigma_1}$, which is strictly U-shaped in a (consistent with Proposition 2). The type that minimizes $v(a)$ is $a_k = \sigma_1 s_0$. Let $a_z \in (a' - \Delta, a' + \Delta)$ denote the equilibrium threshold (assuming an interior equilibrium). From Corollary 4, the equilibrium conditions are $v(a_z) = v(\phi(a_z))$ and $\frac{1}{2\Delta}(2\Delta - a_z + \phi(a_z)) = \tau_1$, where $\tau_1 := \frac{F_1}{L}$ measures the tightness of the labor market. Solving these conditions proves the next result.

Proposition 6 (Equilibrium in the Quadratic-Uniform Case). *In an interior equilibrium of the quadratic-uniform case, types $a \in (\sigma_1 s_0 - \Delta(1 - \tau_1), \sigma_1 s_0 + \Delta(1 - \tau_1))$ work in the inflexible sector and are paid wage $w_0^* = y - \frac{\sigma_0 s_0^2}{2}$, and types $a \leq \sigma_1 s_0 - \Delta(1 - \tau_1)$ and $a \geq \sigma_1 s_0 + \Delta(1 - \tau_1)$ work in the flexible sector and are paid wage $w(a) = w_0^* + \frac{\sigma_1 s_0^2}{2} - \frac{\Delta^2}{2\sigma_1}(1 - \tau_1)^2 - \frac{a^2}{2\sigma_1}$.*

Note that wages decrease with a (consistent with Corollary 2). Consistent with Corollary 1, flexible firms are polarized. The equilibrium degree of polarization is $\rho = \frac{2\Delta(1-\tau_1)}{\sigma_1}$. We can thus rewrite the marginal type as $a_z = a_k + \frac{\sigma_1 \rho}{2}$. The equilibrium profit in the

[8] Equivalently, α is distributed according to c.d.f. $P(\alpha) = \frac{\alpha}{1-\alpha}$ on $[\frac{a'-\Delta}{1+a'-\Delta}, \frac{a'+\Delta}{1+a'+\Delta}]$.

[9] Note that we now allow the cost function to differ across sectors. This variation has no implications for the previous analysis but allows for more interesting comparative statics.

flexible sector is $\pi^* = v(a_z) = \frac{\sigma_0 s_0^2}{2} - a_z s_0 + \frac{a_z^2}{2\sigma_1} = \frac{(\sigma_0 - \sigma_1)s_0^2}{2} + \frac{\sigma_1 \rho^2}{8}$; the profit is increasing and convex in polarization. Note that the solution is interior if $a' \in (a_k - \Delta\tau_1, a_k + \Delta\tau_1)$. To perform comparative statics while keeping the solution interior, from now on we make the simplifying assumption that $a' = a_k$.

Averaging $w(a)$ over all types employed in the flexible sector defines the average wage in that sector:

$$\overline{w} := w_0 + \frac{\sigma_1 s_0^2}{2} - \frac{\Delta^2(1-\tau_1)^2}{2\sigma_1} - M(\sigma_1, \Delta, \tau_1, s_0), \tag{14}$$

where $M(\sigma_1, \Delta, \tau, s_0)$ is the average monetary cost of producing s:

$$\begin{aligned} M(\sigma_1, \Delta, \tau_1, s_0) &:= \tfrac{1}{4\sigma_1\tau_1\Delta}\left[\int_{a_k-\Delta}^{a_k-\Delta(1-\tau_1)} a^2 da + \int_{a_k+\Delta(1-\tau_1)}^{a_k+\Delta} a^2 da\right] \\ &= \tfrac{3\sigma_1^2 s_0^2 + \Delta^2(3(1-\tau_1)+\tau^2)}{6\sigma_1}. \end{aligned} \tag{15}$$

We first consider the impact of σ_1 on polarization, profits, and wages:

Prediction 1. *If flexible firms can offer s-quality at a lower cost (i.e., σ_1 is lower), firms are more polarized, the profit is higher, and the average wage is lower.*

When σ_1 falls, firms produce more s, both because they offer higher s-quality to a given type a and because a_k increases, which then increases both a_z and $\phi(a_z)$. Because the distance between a_z and $\phi(a_z)$ remains the same, polarization $\rho = (a_z - \phi(a_z))/\sigma_1$ increases when σ_1 falls. Intuitively, polarization increases because a fall in σ_1 has a larger impact on the marginal cost of producing s for larger values of s.[10]

The flexible sector's profit is higher when σ_1 is lower for two reasons. First, producing s becomes less costly. Second, the flexible sector becomes relatively more cost-efficient

[10] This is a consequence of the convexity of $c(s)$; the quadratic-cost assumption is not needed.

than the inflexible sector, which makes the inflexible sector less competitive. The effect of σ_1 on the average wage also has two parts. First, as s-quality becomes cheaper, firms substitute s-quality for wages. Second, as the flexible sector becomes more competitive, flexible firms capture a larger share of the surplus.

Next, we consider the impact of Δ on polarization, profits, and wages:

Prediction 2. *In sectors with more dispersion in worker preferences for s-quality, firms are more polarized, the profit is higher, and the average wage is lower.*

This result is closely related to Proposition 4. An increase in Δ is an increase in risk: it removes mass from intermediate values of a and reallocates this mass to the tails without changing the mean. The average wage again decreases for two reasons. First, because the profit increases, there is less surplus left to the workers. Second, because of increased firm polarization (i.e., dispersion in s), the average cost of producing s increases due to the convexity of the cost function.

Finally, we consider the impact of τ_1 on polarization, profits, and wages.

Prediction 3. *In more concentrated sectors, firms are more polarized, the profit is higher, and the average wage is lower.*

In more concentrated sectors, i.e., sectors with fewer firms, there is less competition for those workers qualified to work in the sector. Thus, firms are more profitable in such sectors. Because firms first target workers with extreme preferences, polarization in s-quality is more pronounced when there are fewer firms.

4.2 Firm Polarization and the Labor Share

An extensive empirical literature documents a decline in the labor share of value added. There are two leading explanations for the decline in the labor share: technological improvements that make superstar firms more efficient (Autor et al. (2020)) and barriers to entry that reduce competition (Covarrubias, Gutiérrez, and Philippon (2019)). In the cross-section, Barkai (2020) shows that more concentrated industries have higher "pure" profits and lower labor and capital shares.

In this subsection, we consider the relationship between the flexible sector's labor share and firm polarization in job quality (and thus, implicitly, the flexible sector's profit). Formally, the flexible sector's labor share is defined (in the general model) as

$$\text{Labor share} := \frac{L\int_0^{\phi(\alpha_z)} w(\alpha)dP(\alpha) + L\int_{\alpha_z}^1 w(\alpha)dP(\alpha)}{F_1\pi^* + L\int_0^{\phi(\alpha_z)} w(\alpha)dP(\alpha) + L\int_{\alpha_z}^1 w(\alpha)dP(\alpha)}, \tag{16}$$

where the numerator is the sector's aggregate wage bill and the denominator is the sector's (financial) value added. In the quadratic-uniform case, we can rewrite the labor share as

$$\text{Labor share} = \frac{w_0 + \frac{\sigma_1 s_0^2}{2} - \frac{\Delta^2(1-\tau_1)^2}{2\sigma_1} - M(\sigma_1, \Delta, \tau_1, s_0)}{y - M(\sigma_1, \Delta, \tau_1, s_0)}, \tag{17}$$

which is the average wage over the average value added. The next proposition shows that firm polarization is negatively related to the labor share.

Proposition 7 (**Polarization and the Labor Share**). *In the quadratic-uniform case, the labor share is smaller in more polarized sectors.*

Polarization increases if the flexible sector becomes more concentrated (lower τ_1), if firms become more efficient at producing s (lower σ_1), or if the workers' preferences for s become more dispersed (higher Δ). In all three cases, increased polarization is associated with smaller labor shares. Although all three shocks—reduced competition, improved efficiency, and greater preference dispersion—reduce the labor share, the welfare implications are quite different. A smaller labor share resulting from more industry concentration reduces workers' welfare. In contrast, a lower cost of producing s increases profits and has an ambiguous impact on workers' welfare. More efficient workplace technologies allow firms to offer jobs with higher s-quality at a lower cost. Firms will thus offer contracts with lower wages and higher s-quality. Although the financial labor share falls, some workers are better off because they can choose from an improved menu of wages and s-quality levels. In particular, workers of types $a \geq a_z$ (the before-shock threshold type) benefit. Similarly, some workers with types (a_k, a_z) (defined before the shock) will now be offered jobs in the flexible sector. These workers are also better off. In contrast, some workers with weaker preferences for s-quality will be made worse off. In particular, the worker of type $\phi(a_z)$ (defined before the shock) will no longer be employed in the flexible sector. Intuitively, the welfare impact is heterogeneous because a decrease in σ_1 is a biased technological change that benefits workers with stronger preferences for s-quality. Finally, changing Δ is a preference shock, thus its welfare consequences are not well defined.

4.3 Workers in Excess Supply

In this subsection, we extend the analysis to the case where workers, rather than firms, are in excess supply. That is, we assume that $L > F_0 + F_1$. This assumption implies that some workers will remain unemployed. We normalize the consumption of unemployed workers to zero.

To illustrate the differences between the baseline model and the model with workers in excess supply, we consider the quadratic-uniform case. The equilibrium conditions that determine a_z are unchanged, implying $a_z = \sigma_1 s_0 + \Delta(1-\tau_1)$. The wage function is thus $w(a) = w_0^* + \frac{\sigma_1 s_0^2}{2} - \frac{\Delta^2}{2\sigma_1}(1-\tau_1)^2 - \frac{a^2}{2\sigma_1}$. To solve for the equilibrium, we need to determine w_0^*. Because all inflexible firms will now hire workers, we also need to determine which workers are hired. Firms in the inflexible sector prefer to hire workers with higher a. Thus, for a given equilibrium a_z, there exists a threshold type $a_0 = a_z - 2\Delta\tau_0 = \sigma_1 s_0 + \Delta(1 - \tau_1 - 2\tau_0)$ such that inflexible firms hire all types in (a_0, a_z). Because we normalize the consumption of unemployed workers to zero, we find $w_0^* = -s_0 a_0 = -s_0(\sigma_1 s_0 + \Delta(1 - \tau_1 - 2\tau_0))$.

This case has the same qualitative properties as when workers are in short supply. While most of the previous comparative statics apply, this version of the model allows for new comparative statics with respect to τ_0 and the effect of parameters on wages and profits in the inflexible sector. In particular, because w_0^* decreases with τ_1, and the value added per firm ($y - \frac{\sigma_0 s^2}{2}$) is independent of τ_1, we have the following result:

Prediction 4. *If flexible firms become more efficient at producing s-quality (i.e., σ_1 is lower), the inflexible sector's labor share increases.*

Intuitively, as the flexible sector becomes more efficient at producing the s-attribute, its firms hire workers with stronger preferences for s. As a_z decreases, inflexible firms have to hire workers with weaker preferences for the s-attribute. Such workers demand higher wages, increasing the labor share of the inflexible sector. While the effect of σ_1 on the flexible sector's labor share is non-monotonic, lowering τ_1 will eventually decrease the flexible sector's labor share. Thus, as the flexible sector becomes more efficient at creating high-quality jobs, its labor share eventually decreases while the inflexible sector's labor share increases. While the labor share has been decreasing in most sectors in the US, in the financial sector, the labor share has been increasing (see Autor et al. (2020)). These patterns are compatible with most sectors becoming more efficient at improving job quality, forcing the (likely inflexible) financial sector to increase wages to attract workers.

4.4 Outside investors

In this subsection, we introduce a new class of players: outside investors. Outside investors are atomistic and in large supply. They can buy shares of both flexible and inflexible firms. For simplicity, we normalize the number of shares in each firm to one. To introduce a trading stage, we assume that entrepreneurs first set up their firms and then sell shares to outside investors. Outside investors hold the shares until the end of the period, when firms are liquidated and profits are paid out as dividends. We assume no time discounting and no uncertainty.[11]

We assume that operating costs, $w + c(s)$, are paid out of current cash flows, y, whenever possible. If $y < w + c(s)$, the firm uses its working capital to plug the difference. To invest in working capital, a firm needs to raise funds from outside investors. Let $e_1(s, w) + e_2(s, w)$ denote the total amount that outside investors pay in exchange for one share of a company that offers contract (s, w), where $e_1(s, w)$ is the amount raised in a primary offering (i.e., the funds stay in the firm) and $e_2(s, w)$ is the secondary offering

[11] The lack of risk in our model can be alternatively interpreted as perfect risk sharing. Suppose that each firm produces $y + \epsilon$, with ϵ idiosyncratic. By holding shares in a mass of firms, one can perfectly diversify away all risks.

amount (i.e., the proceeds go to the entrepreneur). Let $d(s, w)$ denote the dividend paid at the end of the period. Limited liability implies that dividends must be non-negative. If $\pi(s, w) \geq 0$, all costs can be funded internally, thus $e_1(s, w) = 0$ and $d(s, w) = \pi(s, w)$. If $\pi(s, w) < 0$, then $e_1(s, w) = -\pi(s, w)$ and $d(s, w) = 0$.

Let $u\big(\varepsilon - e_2(s, w) + \beta s + (1 - \beta)\pi(s, w)\big)$ denote the utility of a shareholder who starts with endowment ε and buys one share of a company that offers contract (s, w) by paying $e_2(s, w)$ to the entrepreneur (plus, if needed, $e_1(s, w)$ in a primary offering) and later collects dividend $d(s, w) = \pi(s, w)$ (or $d(s, w) = 0$ if $\pi(s, w) < 0$) .[12] Similar to the workers' preferences, here $\beta \in [0, 1]$ denotes the shareholder's preference for the s-attribute. To simplify the analysis while conveying the main message, we assume that there are two types of outside investors: one with $\beta = 0$ and one with $\beta > 0$. We call investors of the first type "profit-driven investors" (or *π-investors*) and the second "socially responsible investors" (or *s-investors*). We interpret s as an environmental or social attribute that is viewed positively by both workers and investors. Profit-driven investors care about the environmental or social attributes of their investments only because of the financial value they might create. Socially responsible investors care directly about such attributes in addition to financial value.[13] Using Stark's (2023) terminology, π-investors care about financial *value*, while s-investors also care about *values*. We assume that both investor types are in large supply. This assumption implies that, unlike much of the literature, the introduction of socially responsible investors expands the set of financing choices, thus

[12] Alternatively, we can write this utility as $u\big(\varepsilon - e_2(s, w) + \beta s + (1 - \beta)\left[d(s, w) - e_1(s, w)\right]\big)$.

[13] This preference is of a "warm-glow" type. Investors may also care about the aggregate value of s in the economy, regardless of their shareholdings (in Oehmke and Opp's (2022) language, they could have a "broad mandate"). However, because investors are atomistic, such preferences would have no impact on firm outcomes (see Pástor et al. (2021) for a similar conclusion in an asset pricing model with atomistic investors).

increasing the options available to all flexible entrepreneurs.

Which investors will buy shares in firms with high-α workers: profit-driven investors or socially responsible investors? At first glance, it may seem that socially responsible investors are more likely to buy shares in such firms, because they are willing to pay more for firms with high s levels. However, we show that the equilibrium effects are subtler than this intuition. Firms that hire workers with very strong preferences for s create large surpluses (see Proposition 1). Thus, profit-driven investors will target such firms because of the potential to extract large profits. Although competition among profit-driven investors will drive their returns to zero,[14] profit-driven investors have a comparative advantage over socially responsible investors in companies where the potential for profit is high. Similarly, socially responsible investors have a comparative advantage in the market for low-profit firms.

To characterize the equilibrium, we note first that the efficient s level for a firm owned by an s-investor depends on β. Suppose an s-investor matches with a worker of type α. Using the same reasoning as before, we can show that $s^*_{\alpha\beta} = h\left(\alpha + \beta - 2\alpha\beta\right)$. That is, the s-investor increases the efficient s level. Because contracts must be efficient in a competitive equilibrium, the s-investors affect the s levels of the firms in which they invest.

Do socially responsible investors affect s levels through "impact" (i.e., voice) or "divestment" (i.e., exit)? Because the model has no frictions, either channel delivers the same result. To see this, suppose that the entrepreneur cannot commit to a contract; i.e., any contract between a worker of type α and an entrepreneur can be renegotiated after the firm is sold to an s-investor, and either party can unilaterally exit. In this case, the s-investor

[14]Note there is no risk or time discounting in our environment, thus zero return is the fair compensation for their investments.

and the worker will always renegotiate the contract and agree to the efficient s level, $s^*_{\alpha\beta}$. Under this interpretation, s investors are "impact investors."

Suppose instead an entrepreneur first commits to a contract (s, w). To maximize the price of the share, the entrepreneur should choose the contract $(s^*_{\alpha\beta}, w^*_{\alpha\beta})$, because it maximizes the surplus for an s-investor subject to the participation of a type-α worker. That is, the most profitable way of attracting investors is to choose the efficient s level. In other words, the s-investors would not invest at the desirable price unless the entrepreneur commits to $(s^*_{\alpha\beta}, w^*_{\alpha\beta})$.

For simplicity, we proceed with the quadratic cost function and work with the "transformed" types $a = \frac{\alpha}{1-\alpha}$ (none of the results in this subsection depends on the type distribution $P(.)$). Define $b := \frac{\beta}{1-\beta}$. We then have $s^*_{ab} = \frac{a+b}{\sigma_1}$. The next proposition describes the optimal contract in the inflexible sector.

Proposition 8 (Inflexible Sector Equilibrium). *In an equilibrium with two types of shareholders and $c_\iota(s) = \frac{\sigma_\iota s^2}{2}$, only s-investors buy shares of inflexible firms. The equilibrium wage in the inflexible sector is $w^*_0 = bs_0 + y - \frac{\sigma_0 s_0^2}{2}$ and firm profit is $\pi(s_0, w^*_0) = -bs_0$.*

We now consider the equilibrium in the flexible sector. Let $v(a, b)$ denote the profit potential when an s-investor matches with a type-a worker. As in Proposition 2, it is easy to verify that $v(a, b)$ is U-shaped in a. We use $v(a, 0)$ to denote the profit potential under a π-investor. We have the following result:

Proposition 9 (Profit Potential and Investor Type). *Let $c_\iota(s) = \frac{\sigma_\iota s^2}{2}$. We have $v(a, b) \geq$*

$v(a,0)$ if and only if $a \in [a^-, a^+]$, where[15]

$$\{a^-, a^+\} := 1 + \sigma_1 s_0 \pm \sqrt{(1 + 2\sigma_1 s_0)(1 + b) + \sigma_1 s_0^2(\sigma_1 - \sigma_0)}.$$

This proposition implies that s-investors create more value if matched with workers with intermediate preferences, while π-investors create more value if matched with workers with extreme preferences. This result holds because the profit potential function is U-shaped; workers with intermediate preferences should be matched with socially responsible investors because such investors care less about profits.

Under a continuum of worker types, the unique equilibrium is given by the same conditions as in Corollary 4, once we define $v(a) := \max\{v(a,0), v(a,b)\}$.[16] Let a_z denote the equilibrium marginal worker type. Firm $(s^*_{a_z}, w^*_{a_z})$ will be sold for $e_2(s^*_{a_z}, w^*_{a_z}) = v(a_z)$, which will also be the price for all other flexible firms (all flexible entrepreneurs must make the same profit from selling their shares). Because $v(a) \geq v(a,0)$, the entrepreneurs' are (weakly) better off when s-investors are available.

If $a_z \geq a^+$, then s-investors do not invest in the flexible sector. If $a_z < a^+$, the equilibrium displays *perfect segmentation*: s-investors buy shares in firms that hire workers of types $a \in [a^-, a^+]$, while π-investors buy shares in firms that hire workers of types $a \leq a^-$ and $a \geq a^+$.[17] An increase in b—the intensity of socially responsible investors' preferences for the s-attribute—decreases a^- and increases a^+, thus widening the range of

[15] Equivalently, we have $\alpha \in [\alpha^-, \alpha^+]$, where $\alpha^- := \max\{\frac{a^-}{1+a^-}, 0\}$ and $\alpha^+ := \frac{a^+}{1+a^+}$.

[16] The analysis can be easily generalized to any number m of different types of investors, $\{b_1, ..., b_m\}$, by defining $v(a) = \max\{v(a,b_1), ..., v(a,b_m)\}$.

[17] Perfect segmentation is a consequence of the assumption of no uncertainty (or, equivalently, perfect risk-sharing). If we instead assume that risk exists and the number of firms is finite, then diversification would give investors incentives to hold shares of all firms. In that case, s-investors would "tilt" their portfolios towards stocks in which $a \in [a^-, a^+]$, while π-investors would tilt their portfolio away from such stocks.

worker types for which s-investors have an advantage relative to π-investors. A larger b also indicates more extreme shareholder preferences with respect to the s attribute. Thus, all else constant, an increase in risk in shareholder preferences increases the number of entrepreneurs willing to sell shares to s-investors and the flexible firms' market values. Conversely, a generalized increase in risk in worker preferences would reduce the number of entrepreneurs who sell to socially responsible investors but also increases market values.

The next proposition compares market valuations and stock returns between flexible and inflexible firms.

Proposition 10 (Flexibility, Firm Value, and Stock Returns). *Relative to inflexible firms, flexible firms have higher market valuations and higher stock returns.*

While it is not always clear which sectors or industries have flexible technologies, such sectors can be empirically identified by their within-sector dispersion in the s-attribute (i.e., how polarized they are in their s choices), which can be measured by ESG metrics or other similar variables. The model then predicts high firm valuations in sectors with high ESG dispersion. Similarly, average stock returns should be higher in sectors where firms are more polarized in their ESG choices (or other similar variables that are viewed positively by both workers and investors).

The model also predicts a link between employee satisfaction and stock returns. In particular, firms with the highest stock returns are flexible firms sold to profit-driven investors. These firms also have the highest levels of employee satisfaction (measured by C_i^*, which is the willingness to pay for a job). Because employee satisfaction is also U-shaped in equilibrium, the firms with the lowest employee satisfaction scores are inflexible firms.

Such firms also have the lowest stock returns. While the relationship between firm-level employee satisfaction and stock returns does not need to be monotonic, the model predicts that firms at the upper end of employee satisfaction will have higher returns than firms at the low end of employee satisfaction.

4.5 Firm Creation

Here we drop the assumption that F_0 and F_1 are exogenous. Suppose there is a large number of identical atomistic entrepreneurs. At the ex-ante stage, these entrepreneurs pay cost K_ι to create a firm in Sector $\iota \in \{0, 1\}$. For simplicity, we set $K_0 = 0$. We work with the continuum case. Let $z(F_1)$ denote the equilibrium marginal worker type when the mass of flexible firms is F_1. Note that $z(F_1)$ is continuous and strictly decreasing in F_1 (recall that $z(F_1)$ is defined as the marginal type to the right of α_k). Thus, the equilibrium firm value $v(z(F_1))$ for a given F_1 is continuous and strictly decreasing in F_1. This is intuitive: Firm value is lower when there are more flexible firms competing for the same workers.

If an entrepreneur needs to pay cost $K_1 > 0$ to create a flexible firm, entrepreneurs would enter the sector if $v(z(F_1)) > K_1$, and not enter if $v(z(F_1)) < K_1$. If $v(z(L)) < K_1$, there exists an unique $F_1^* < L$ such that $v(z(F_1^*)) = K_1$. Thus, F_1^* is the unique equilibrium mass of flexible firms. If $v(z(L)) \geq K_1$, then the only equilibrium requires $F_1^* = L$. In either case, the ex-post equilibrium value of flexible firms is $v(z(F_1^*))$. When entry is endogenous, an increase in risk in workers' preferences for the s-attribute leads to more entry in the flexible sector.

When entry is endogenous, entrepreneurs in the flexible sector make zero profit in expectation: $v(z(F_1^*)) - K_1 = 0$. Similarly, entrepreneurs will enter the inflexible sector until their profits are zero. Outside investors (both s-investors and π-investors) are also in excess supply and thus earn their respective outside utilities. Only workers end up with positive surpluses in equilibrium. This makes sense: Labor is the only scarce resource in this economy.

5 Conclusion

When workers have preferences for purposeful or socially responsible jobs, profit-maximizing firms will cater to such preferences. By designing jobs with these positive attributes, firms can lower their wage bills. Conversely, firms can also benefit from making a job *less* socially responsible or sustainable because it may cost less to produce using a "dirty" technology. When facing workers with heterogeneous preferences for CSR/ES, firms that have flexible technologies will cater to workers with the most extreme preferences. That is, such firms will appear more polarized in their CSR/ES choices than the preferences of the underlying population.

Firm polarization in CSR/ES investments has several normative and positive implications. In the cross-section, firm value and stock returns are U-shaped in ES qualities. Sectors with more dispersion in CSR/ES metrics should have higher average stock returns. These predictions are still untested. Our model also predicts that both high and low CSR/ES firms are harmed by the introduction of minimum standards. Thus, in the absence of other forces, both types of firms are equally likely to oppose policies such as maximum emissions or diversity quotas. In addition, because all firms benefit when worker preferences become more polarized, firms would welcome the spread of conflicting information that is likely to polarize opinions and entrench extreme views.

Our model has the surprising result that socially responsible investors may be less likely to invest in very high ES firms than are purely financial investors. This result is explained by the higher profit potential of high-ES firms. This potential for profit attracts profit-driven investors, pushing share prices up. Socially responsible investors prefer firms with intermediate CSR/ES levels. Such investors have a direct impact on their firms' CSR/ES levels, which are higher than they would have been if sold to purely financial investors. These firms have lower valuations, and also lower stock returns because the marginal investor in these firms is willing to sacrifice some basis points in exchange for additional investments in CSR/ES.

Appendix

Proof of Lemma 1. The Lagrangian for the problem is:

$$\max_{s,w} \omega \left(u(C_i(s,w)) - u(C_0)\right) + (1-\omega)\pi(w,s) - \lambda(C_0 - C_i(s,w)) - \mu\pi(s,w). \tag{18}$$

The first-order conditions are:

$$\begin{aligned} &\omega\alpha_i u'(C_i) - (1-\omega)c'(s) + \lambda\alpha_i + \mu c'(s) = 0 \\ &\omega(1-\alpha_i)u'(C_i) - (1-\omega) + \lambda(1-\alpha_i) + \mu = 0. \end{aligned} \tag{19}$$

Only one of the two participation constraints can bind, so there are three cases: $\lambda = \mu = 0$, $\lambda > 0$ and $\mu = 0$, or $\lambda = 0$ and $\mu > 0$. In each of these three cases, from (19) we find that $s_i^* = h\left(\alpha_i\right)$, where $h(\alpha_i) = c'^{-1}(\frac{\alpha_i}{1-\alpha_i})$. For ω sufficiently low (including $\omega = 0$), we have $\lambda > 0$ and $\mu = 0$, in which case the optimal wage is $w_i^* = \frac{C_0 - \alpha_i s_i^*}{1-\alpha_i}$. For ω sufficiently high (including $\omega = 1$), the participation constraint of the shareholders binds (i.e., $\mu > 0$ and $\lambda = 0$), and $w_i^* = y - c(s_i^*)$. For intermediate values of ω, we have $\lambda = \mu = 0$, then $w_i^* = \frac{g(\alpha_i,\omega)-\alpha_i s_i^*}{1-\alpha_i}$, where $g(\alpha_i,\omega) = u'^{-1}\left(\frac{(1-\omega)}{\omega(1-\alpha_i)}\right)$. To arrive at expression (1), we then define $g(\alpha_i, 0) = 0$ and $g(\alpha_i, 1) = \infty$. □

Proof of Proposition 1. **Case (i)**: $w_i^* = \frac{C_0-\alpha_i s_i^*}{1-\alpha_i}$. This is the case where the worker's participation constraint binds, i.e., $C_i^* := C_i(s_i^*, w_i^*) = C_0$. Thus:

$$\frac{\partial V(\alpha_i, \omega, C_0)}{\partial \alpha_i} = \omega u'(C_i^*)(s_i^* - w_i^*) + \lambda(s_i^* - w_i^*). \tag{20}$$

Since $C_i^* = C_0$ and $w_i^* = \frac{C_0-\alpha s_i^*}{1-\alpha}$, we can simplify equation (20) as follows

$$\frac{\partial V(\alpha_i, \omega, C_0)}{\partial \alpha_i} = (\omega u'(C_i^*) + \lambda)(s_i^* - w_i) = \frac{1-\omega}{(1-\alpha_i)^2}\left(s_i^* - C_0\right). \tag{21}$$

Define α_χ such that $C_0 = h(\alpha_\chi)$. For $\alpha_i < \alpha_\chi$, $\frac{\partial V(\alpha_i,\omega,C_0)}{\partial \alpha_i} < 0$, and for $\alpha_i > \alpha_\chi$, $\frac{\partial V(\alpha_i,\omega,C_0)}{\partial \alpha_i} > 0$, that is $V(\alpha_i, \omega, C_0)$ is strictly U-shaped.

Case (ii): $w_i^* = \frac{g(\alpha_i,\omega)-\alpha_i s_i^*}{1-\alpha_i}$. Note that, in this case, ω cannot be zero or one. Using the Envelope Theorem:

$$\frac{\partial V(\alpha_i, \omega, C_0)}{\partial \alpha_i} = \omega u'(C_i^*)(s_i^* - w_i^*). \tag{22}$$

We use that $u'(C_i^*) = \frac{1-\omega}{\omega(1-\alpha_i)}$, $s_i^* = h(\alpha_i)$ and $w_i^* = \frac{g(\alpha_i,\omega)-\alpha_i s_i^*}{1-\alpha_i}$ to simplify equation (22) as follows:

$$\frac{\partial V(\alpha_i, \omega, C_0)}{\partial \alpha_i} = \frac{1-\omega}{(1-\alpha_i)^2}\left(h(\alpha_i) - g(\alpha_i, \omega)\right). \tag{23}$$

We now show that an α_i for which

$$\frac{(1-\omega)}{(1-\alpha_i)^2}(h(\alpha_i) - g(\alpha_i, \omega)) = 0 \tag{24}$$

exists and is unique. The derivative of the left-hand side of (24) is $\frac{1-\omega}{(1-\alpha_i)^2}(h'(\alpha_i) - g_\alpha(\alpha_i, \omega)) + \frac{2(1-\omega)}{(1-\alpha)^3}(h(\alpha_i) - g(\alpha_i, \omega))$. To show that there exists a unique α' such that $h(\alpha') = g(\alpha', \omega)$, note that $h(.)$ is increasing in α_i, with $h(0) = 0$ (because $c'(0) = 0$) and $\lim_{\alpha \to 1} h(\alpha_i)$ converging to a positive number or infinity, while $g(.)$ is decreasing in α_i, with $g(0, \omega) > 0$ (since in this case we must have $\omega > 0$) and $\lim_{\alpha \to 1} g(\alpha, \omega) = 0$ (because of the Inada condition that $u'(0) = \infty$). It follows that α' for which $h(\alpha') = g(\alpha', \omega)$ exists and is unique. For $\alpha_i \leq \alpha'$ we have $h(\alpha_i) \leq g(\alpha_i, \omega)$; for $\alpha_i \geq \alpha'$ we have $h(\alpha_i) \geq g(\alpha_i, \omega)$. This and the fact that $h'(\alpha_i) = \left[(1-\alpha_i)^2 c''(h(\alpha_i))\right]^{-1} > 0$ and $g_\alpha(\alpha_i, \omega) = \frac{1-\omega}{\omega(1-\alpha_i)^2 u''(g(\alpha_i, \omega))} < 0$ (because $\omega < 1$), implies that the left-hand side of (24) is either increasing for all α_i if $h'(0) - g_\alpha(0, \omega) \geq 2g(0, \omega)$, otherwise the left-hand side of (24) is first decreasing in α_i and then increasing in α_i. For $\alpha_i = 0$, the left-hand side of (24) is $-(1-\omega)g(0, \omega) < 0$, and for $\alpha_i = 1$, we have $\lim_{\alpha_i \to 1} \frac{1-\omega}{(1-\alpha_i)^2}(h(\alpha_i) - g(\alpha_i, \omega)) \to \infty$. It follows that an α' such that (24) holds exists and is unique. For $\alpha_i < \alpha'$, $\frac{\partial V(\alpha_i, \omega, C_0)}{\partial \alpha_i} < 0$ and for $\alpha_i > \alpha'$, $\frac{\partial V(\alpha_i, \omega, C_0)}{\partial \alpha_i} > 0$.

Case (iii): $w_i^* = y - c(s_i^*)$. In this case:

$$\frac{\partial V(\alpha_i, \omega, C_0)}{\partial \alpha_i} = \omega u'(C_i^*)(s_i^* - w_i^*) = \omega u'(C_i^*)(h(\alpha_i) - y + c(h(\alpha_i))). \tag{25}$$

We have that $h(\alpha_i) + c(h(\alpha_i))$ is increasing in α_i, with $h(0) + c(h(0)) = 0$ and $\lim_{\alpha_i \to 1} h(\alpha_i) + c(h(\alpha_i)) = \infty$. Thus, there exists a unique α' such that $h(\alpha') + c(h(\alpha')) = y$. For $\alpha_i < \alpha'$, $\frac{\partial V(\alpha_i, \omega, C_0)}{\partial \alpha_i} < 0$ and for $\alpha_i > \alpha'$, $\frac{\partial V(\alpha_i, \omega, C_0)}{\partial \alpha_i} > 0$. □

Proof of Proposition 2. For $\omega = 0$, the worker's participation constraint binds, i.e., $C_i^* := C_i(s_i^*, w_i^*) = C_i(s_0, w_0) = w_0 + \alpha_i(s_0 - w_0)$. Thus:

$$v'(\alpha_i) = \lambda(s_i^* - w_i^* - s_0 + w_0) \tag{26}$$

Since $w_i^* = w_0 + \frac{\alpha}{1-\alpha}(s_0 - s_i^*)$, we can simplify equation (26) as follows

$$v'(\alpha_i) = \lambda(s_i^* - w_i^* - s_0 + w_0) = \frac{s_i^* - s_0}{(1-\alpha_i)^2}. \tag{27}$$

Define α_k such that $s_0 = h(\alpha_k)$. For $\alpha_i < \alpha_k$, $v'(\alpha_i) < 0$, and for $\alpha_i > \alpha_k$, $v'(\alpha_i) > 0$, that is $v(\alpha_i)$ is strictly U-shaped. □

Proof of Lemma 2. To show that $\pi(s_0, w_0^*) = 0$, we need to consider two possible cases. First, suppose that $\sum_{i=1}^{n} x_{i0}^* = F_0$. Since $L < F_0 + F_1$, it follows that some flexible firms do not employ anyone, which means that all flexible firms have zero profit in equilibrium, in every market they can possibly operate, including market $j = 0$, which implies $\pi(s_0, w_0) = 0$. Second, suppose that $\sum_{i=1}^{n} x_{i0}^* < F_0$. Now some inflexible firms have zero profit because they do not operate; therefore, $\pi(s_0, w_0) = 0$.

To show that $\pi(s_j^*, w_j^*) = \pi^* > 0$ for all $j \in \{1, ..., n\}$ such that $x_j^* > 0$, note that the labor demand correspondence implies that all flexible firms must have the same profit in equilibrium, i.e., $\pi(s_j^*, w_j^*) = \pi^* \geq 0$ for all $j \in \{1, ..., n\}$ such that $x_j^* > 0$. Suppose that $\pi(s_j^*, w_j^*) = 0$ for $x_j^* > 0$ and $j \neq k$. Therefore, $u(C_j(s_j^*, w_j^*)) - u(C_j(s_0, w_0)) = V(\alpha_j, 1, C_j(s_0, w_0)) > 0$ for all types $j \neq k$. Such types will offer to work in the flexible sector, implying that labor supply to the flexible sector is L (because p_k is arbitrarily small), which is not possible in equilibrium because $L > F_1$. Thus, we must have $\pi^* > 0$. □

Proof of Proposition 3. Assumption 2 implies that $v(\alpha_j)$ can be strictly ranked for all $j \in \{1, ..., n\}$. Let m index types according to $v(\alpha_j)$, that is, $m+1 > m$ implies $v(\alpha_{m+1}) > v(\alpha_m)$ for all $m \in M = \{1, ..., n\}$. That is, we reorder all n types, from $m = 1$ to $m = n$, so that lower indices mean a lower match surplus. Note that the type that leads to the minimum match surplus is α_k. Define z as the largest element in M such that $\sum_{m=z}^{n} p_m L \geq F_1$. Note that z always exists (because $L > F_1$) and is uniquely defined. Note that the subset $\{z, ..., n\} \subset M$ includes all types with extreme preferences because $v(\alpha_j)$ is strictly U-shaped.

We first show that $x_m^* = 0$ if and only if $m < z$. To show the sufficiency part, suppose that $m < z$ and $x_m^* > 0$. For this quantity to be feasible, there must exist at least one $m' \geq z$ such that $x_{m'} < p_{m'} L$. That is, there is at least one individual of type m' that is employed in the inflexible sector. Without loss of generality, assume then that $m' = z$. Because not all workers of type z are employed in the flexible sector, workers of that type must be indifferent between working in the flexible or the inflexible sector. Thus, the profit in this market must be $v(\alpha_z)$. Because the profit in market m is at most $v(\alpha_m)$, which is lower than $v(\alpha_z)$ by the definition of z, the demand for workers in market m must be zero. Thus, if $m < z$, then $x_m^* = 0$.

To show necessity, suppose $x_m^* = 0$. Then, it must be that all workers of type m work in the inflexible sector. That is, $w_m^* + \alpha_m(s_m^* - w_m^*) \leq w_0^* + \alpha_m(s_0 - w_0^*)$. Thus, $\pi(s_m^*, w_m^*) \geq v(\alpha_m)$. If $m \geq z$, then there must exist $m' < z$ such that $x_{m'}^* > 0$; otherwise we have $\sum_{m=1}^{n} x_m^* < F_1$, which implies that not all flexible firms are active and thus must have zero profit, contradicting Lemma 2. Because m' is an active market, by Lemma 2 it offers profit $\pi^* > 0$. Then, we have $\pi^* \leq v(\alpha_{m'})$ (because $v(.)$ gives the maximum profit for that market), $v(\alpha_{m'}) < v(\alpha_m)$ (because $m' < m$), and $v(\alpha_m) \leq \pi(s_m^*, w_m^*)$ (as argued above). Thus, $\pi(s_m^*, w_m^*) > \pi^*$, which is a contradiction. Thus, if $x_m^* = 0$, then $m < z$.

We now show that for all $m > z$, we have $x_m^* = p_m L$. Because z is the lowest index $j \in M$ such that $x_j^* > 0$, then $\pi^* \leq v(\alpha_z)$. If $x_m^* < p_m L$, the profit in that market is $v(\alpha_m) > v(\alpha_z) \geq \pi^*$, which violates Lemma 2. Thus, for all $m > z$, we have $x_m^* = p_m L$. If $m = z$, $x_z^* = F_1 - \sum_{j \in \{j \neq j : x_z > 0\}} p_j L$, which follows from the aggregate constraints.

The equilibrium wages for $x_j^* > 0$ follow immediately from the fact that all flexible firms have the same profit $v(z)$. If $x_j^* = 0$, wages can be anywhere between $y - c(s_j^*) - v(\alpha_z)$ and $\frac{C_j(s_0, w_0^*) - \alpha_j s_j^*}{1 - \alpha_j}$ since both supply and demand can be zero for such (s, w) pairs. □

Proof of Corollary 1. If $j > 1$, $j < k$, and $x_j^* > 0$, then $v(\alpha_{j-1}) > v(\alpha_j) \geq v(\alpha_z)$, thus (9) implies $x_{j-1}^* = p_{j-1} L$. The argument is symmetric for the other case. □

Proof of Corollary 2. Since profits are the same across all active markets, the equilibrium wages in markets j and j' are such that:

$$w_j^* = w_{j'}^* + c(s_{j'}^*) - c(s_j^*), \tag{28}$$

where $s_{j'}^* = h\left(\alpha_{j'}\right) > h\left(\alpha_j\right) = s_{j'}^*$, and $c(s_{j'}^*) > c(s_j^*)$. It follows that $w_j^* > w_{j'}^*$. □

Proof of Corollary 3. Maximizing profit subject to C_i^* is equivalent to maximizing $C_i(s, w)$ subject to $\pi(s, w) = \pi^*$. Thus, by the Envelope Theorem, $\frac{\partial C_i}{\partial \alpha} = s_i^* - w_i^*$. Define $\hat{\alpha}$ by $h(\hat{\alpha}) + c(h(\hat{\alpha})) = w_z + c(s_z)$. Thus, $\frac{\partial C_i}{\partial \alpha} < 0$ for $\alpha_i < \hat{\alpha}$ and $\frac{\partial C_i}{\partial \alpha} > 0$ for $\alpha_i > \hat{\alpha}$. □

Proof of Corollary 4. A density $p(.)$ can be approximated by a discrete probability function $\hat{p}(.)$ for n equidistant types. Proposition 3 implies the existence of z which characterizes the equilibrium under $\hat{p}(.)$. As $n \to \infty$, if $\hat{p}(.) \to p(.)$, then $z \to z^*$. We then define $z = z^*$. □

Proof of Proposition 4. First, we note that the ranking of $v(\alpha)$ does not depend on the distribution thus it is not affected by the generalized increase in risk. From the definition of a generalized increase in risk:
$\int_z^{\phi(z)} p(\alpha)d\alpha > \int_z^{\phi(z)} \hat{p}(\alpha)d\alpha$ and therefore $F < L\left(\int_0^{\phi(z)} \widehat{p}(\alpha)d\alpha + \int_z^1 \widehat{p}(\alpha)d\alpha\right)$. Since the right-hand side of the equation is continuous and strictly decreasing in z, it follows that $\widehat{z} > z$, where $\widehat{z}$ is given by: $F_1 = L\left(\int_0^{\phi(\widehat{z})} \widehat{p}(\alpha)d\alpha + \int_{\widehat{z}}^1 \widehat{p}(\alpha)d\alpha\right)$. Parts ii) and iii) of the proposition follow directly from $\widehat{z} > z$. □

Proof of Proposition 5. For any $\alpha \leq \tilde{\alpha}$, where $h(\tilde{\alpha}) = \tilde{s}$, the firms are constrained to offer a sustainability level $\tilde{s}$. The maximum profit under the minimum standard is as follows: For $\alpha \leq \tilde{\alpha}$, $\tilde{v}(\alpha) = y - \tilde{w}(\alpha) - c(\tilde{s})$, where $\tilde{w}(\alpha) = w_0 + \frac{\alpha}{1-\alpha}(s_0 - \tilde{s})$; For $\alpha \geq \tilde{\alpha}$, $\tilde{v}(\alpha) = v(\alpha)$ (i.e., the minimum standard does not bind). It follows that $\tilde{v}(\alpha)$ is decreasing in α for $\alpha < k$ and increasing in α for $\alpha > k$. Thus the new equilibrium is determined by conditions (11) and (12) for the function $\tilde{v}(\alpha)$.

Because $\tilde{s} > s^*_{\phi(z)}$ the minimum standard constraint binds at point $\phi(z)$ and therefore $\tilde{v}(\phi(z)) < v(z)$. This implies that $\tilde{\phi}(z) < \phi(z)$ and therefore

$$F > L\left(\int_0^{\tilde{\phi}(z)} p(\alpha)d\alpha + \int_z^1 p(\alpha)d\alpha\right), \tag{29}$$

so the equilibrium $\tilde{z}$, must be such that $\tilde{z} < z$. This implies $\pi(\tilde{z}) < \pi(z)$, and $\tilde{w}(\alpha) > w(\alpha)$ for $\alpha > \tilde{z}$. □

Proof of Corollary 5. The difference in the average s level with and without the minimum standard $\tilde{s}$ is:

$$\int_0^{\tilde{\phi}(\tilde{z})} \tilde{s} p(\alpha) d\alpha + \int_{\tilde{z}}^1 s_\alpha p(\alpha) d\alpha - \int_0^{\phi(z)} s_\alpha p(\alpha) d\alpha - \int_z^1 s_\alpha p(\alpha) d\alpha. \tag{30}$$

Since $\int_{\tilde{z}}^z p(\alpha)d\alpha = \int_{\tilde{\phi}(\tilde{z})}^{\phi(z)} p(\alpha)d\alpha$, equation (30) becomes:

$$\int_0^{\phi(z)} \tilde{s} p(\alpha) d\alpha + \int_{\tilde{z}}^z s_\alpha p(\alpha) d\alpha - \int_0^{\phi(z)} s_\alpha p(\alpha) d\alpha - \int_{\tilde{z}}^z \tilde{s} p(\alpha) d\alpha \tag{31}$$

The increase in the average s in the flexible sector is:
$\int_0^{\phi(z)} (\tilde{s} - s_\alpha) p(\alpha) d\alpha + \int_{\tilde{z}}^z (s_\alpha - \tilde{s}) p(\alpha) d\alpha.$ □

Proof of Predictions 1-3. In case we need the details of how we simplify $M(.)$. Polarization is $\rho = \frac{2\Delta(1-\tau_1)}{\sigma_1}$. Thus it follows that $\frac{\partial \rho}{\partial \sigma_1} < 0$, $\frac{\partial \rho}{\partial \Delta} > 0$, and $\frac{\partial \rho}{\partial \tau_1} < 0$. The equilibrium profit is $\pi^\star = \frac{\sigma_0 s_0^2}{2} - \frac{\sigma_1 s_0^2}{2} + \frac{\Delta^2(1-\tau_1)^2}{2\sigma_1}$. Therefore, $\frac{\partial \pi^\star}{\partial \sigma_1} < 0$, $\frac{\partial \pi^\star}{\partial \Delta} > 0$, and $\frac{\partial \pi^\star}{\partial \tau_1} < 0$. The average wage is $\overline{w} = y - \frac{\sigma_1 s_0^2}{2} - \frac{\Delta^2(1-\tau_1)^2}{2\sigma_1} - \frac{\Delta^2(1-\tau_1)}{2\sigma_1} - \frac{\Delta^2\tau_1^2}{6\sigma_1}$. It follows that: $\frac{\partial \overline{w}}{\partial \sigma_1} > 0$, $\frac{\partial \overline{w}}{\partial \Delta} < 0$, $\frac{\partial \overline{w}}{\partial \tau_1} = \frac{2\Delta^2(1-\tau_1)}{2\sigma_1} + \frac{\Delta^2}{2\sigma_1} - \frac{2\Delta^2\tau_1}{6\sigma_1} = \frac{\Delta^2}{2\sigma_1}(3 - \frac{8\tau_1}{3}) > 0.$ □

Proof of Proposition 7. The expression for the Labor share can be rewritten as follows:

$$\text{Labor share} = \frac{w_0 - \frac{\Delta^2(1-\tau_1)^2}{2\sigma_1} - \frac{\Delta^2(1-\tau_1)}{2\sigma_1} - \frac{\Delta^2\tau_1^2}{6\sigma_1}}{y - \frac{\sigma_1 s_0^2}{2} - \frac{\Delta^2(1-\tau_1)}{2\sigma_1} - \frac{\Delta^2\tau_1^2}{6\sigma_1}} \tag{32}$$

We now derive the effect of σ_1, Δ, and τ_1 on the labor share.

$$
\begin{aligned}
\frac{\partial \text{Labor share}}{\partial \sigma_1} &= \frac{\left(\frac{\Delta^2(1-\tau_1)^2}{2\sigma_1^2}+\frac{\Delta^2(1-\tau_1)}{2\sigma_1^2}+\frac{\Delta^2\tau_1^2}{6\sigma_1^2}\right)\left(y-\frac{\sigma_1 s_0^2}{2}-\frac{\Delta^2(1-\tau_1)}{2\sigma_1}-\frac{\Delta^2\tau_1^2}{6\sigma_1}\right)+\left(\frac{s_0^2}{2}-\frac{\Delta^2(1-\tau_1)}{2\sigma_1^2}-\frac{\Delta^2\tau_1^2}{6\sigma_1^2}\right)\left(w_0-\frac{\Delta^2(1-\tau_1)^2}{2\sigma_1}-\frac{\Delta^2(1-\tau_1)}{2\sigma_1}-\frac{\Delta^2\tau_1^2}{6\sigma_1}\right)}{\left(y-\frac{\sigma_1 s_0^2}{2}-\frac{\Delta^2(1-\tau_1)}{2\sigma_1}-\frac{\Delta^2\tau_1^2}{6\sigma_1}\right)^2} \\
&= \frac{\frac{\Delta^2(1-\tau_1)^2}{2\sigma_1^2}\left(y-M(\sigma_1,\Delta,\tau_1,s_0)\right)+\left(\frac{\Delta^2(1-\tau_1)}{2\sigma_1^2}+\frac{\Delta^2\tau_1^2}{6\sigma_1^2}\right)\pi^*+\frac{s_0^2}{2}\overline{w}}{\left(y-\frac{\sigma_1 s_0^2}{2}-\frac{\Delta^2(1-\tau_1)}{2\sigma_1}-\frac{\Delta^2\tau_1^2}{6\sigma_1}\right)^2}
\end{aligned}
$$

$$
\begin{aligned}
\frac{\partial \text{Labor share}}{\partial \Delta} &= \frac{-\left(\frac{\Delta(1-\tau_1)^2}{\sigma_1}+\frac{\Delta(1-\tau_1)}{\sigma_1}+\frac{\Delta\tau_1^2}{3\sigma_1}\right)\left(y-\frac{\sigma_1 s_0^2}{2}-\frac{\Delta^2(1-\tau_1)}{2\sigma_1}-\frac{\Delta^2\tau_1^2}{6\sigma_1}\right)+\left(\frac{\Delta(1-\tau_1)}{\sigma_1}+\frac{\Delta\tau_1^2}{3\sigma_1}\right)\left(w_0-\frac{\Delta^2(1-\tau_1)^2}{2\sigma_1}-\frac{\Delta^2(1-\tau_1)}{2\sigma_1}-\frac{\Delta^2\tau_1^2}{6\sigma_1}\right)}{\left(y-\frac{\sigma_1 s_0^2}{2}-\frac{\Delta^2(1-\tau_1)}{2\sigma_1}-\frac{\Delta^2\tau_1^2}{6\sigma_1}\right)^2} \\
&= \frac{-\frac{\Delta(1-\tau_1)^2}{\sigma_1}\left(y-M(\sigma_1,\Delta,\tau_1,s_0)\right)-\left(\frac{\Delta(1-\tau_1)}{\sigma_1}+\frac{\Delta\tau_1^2}{3\sigma_1}\right)\left(\frac{\sigma_0 s_0^2}{2}-\frac{\sigma_1 s_0^2}{2}+\frac{\Delta^2(1-\tau)^2}{2\sigma_1}\right)}{\left(y-\frac{\sigma_1 s_0^2}{2}-\frac{\Delta^2(1-\tau_1)}{2\sigma_1}-\frac{\Delta^2\tau_1^2}{6\sigma_1}\right)^2} \\
&= \frac{-\frac{\Delta(1-\tau_1)^2}{\sigma_1}\left(y-M(\sigma_1,\Delta,\tau_1,s_0)\right)-\left(\frac{\Delta(1-\tau_1)}{\sigma_1}+\frac{\Delta\tau_1^2}{3\sigma_1}\right)\pi^*}{\left(y-\frac{\sigma_1 s_0^2}{2}-\frac{\Delta^2(1-\tau_1)}{2\sigma_1}-\frac{\Delta^2\tau_1^2}{6\sigma_1}\right)^2} \\
&< 0
\end{aligned}
\tag{34}
$$

$$
\begin{aligned}
\frac{\partial \text{Labor share}}{\partial \tau_1} &= \frac{\left(\frac{\Delta^2(1-\tau_1)}{\sigma_1}+\frac{\Delta^2}{2\sigma_1}-\frac{\Delta^2\tau_1}{3\sigma_1}\right)\left(y-\frac{\sigma_1 s_0^2}{2}-\frac{\Delta^2(1-\tau_1)}{2\sigma_1}-\frac{\Delta^2\tau_1^2}{6\sigma_1}\right)-\left(\frac{\Delta^2}{2\sigma_1}-\frac{\Delta^2\tau_1}{3\sigma_1}\right)\left(w_0-\frac{\Delta^2(1-\tau_1)^2}{2\sigma_1}-\frac{\Delta^2(1-\tau_1)}{2\sigma_1}-\frac{\Delta^2\tau_1^2}{6\sigma_1}\right)}{\left(y-\frac{\sigma_1 s_0^2}{2}-\frac{\Delta^2(1-\tau_1)}{2\sigma_1}-\frac{\Delta^2\tau_1^2}{6\sigma_1}\right)^2} \\
&= \frac{\frac{\Delta^2(1-\tau_1)}{\sigma_1}\left(y-M(\sigma_1,\Delta,\tau_1,s_0)\right)+\frac{\Delta^2}{2\sigma_1}\left(1-\frac{2\tau_1}{3}\right)\left(\frac{\sigma_0 s_0^2}{2}-\frac{\sigma_1 s_0^2}{2}+\frac{\Delta^2(1-\tau)^2}{2\sigma_1}\right)}{\left(y-\frac{\sigma_1 s_0^2}{2}-\frac{\Delta^2(1-\tau_1)}{2\sigma_1}-\frac{\Delta^2\tau_1^2}{6\sigma_1}\right)^2} \\
&= \frac{\frac{\Delta^2(1-\tau_1)}{\sigma_1}\left(y-M(\sigma_1,\Delta,\tau_1,s_0)\right)+\frac{\Delta^2}{2\sigma_1}\left(1-\frac{2\tau_1}{3}\right)\pi^*}{\left(y-\frac{\sigma_1 s_0^2}{2}-\frac{\Delta^2(1-\tau_1)}{2\sigma_1}-\frac{\Delta^2\tau_1^2}{6\sigma_1}\right)^2} \\
&> 0
\end{aligned}
\tag{35}
$$

□

Proof of Prediction 4. The labor share in the inflexible sector is:

$$\text{Labor share}_0 = \frac{w_0^*}{\pi_0^* + w_0^*} = \frac{-s_0(\sigma_1 s_0 + +\Delta(1-\tau_1-2\tau_0))}{y - \frac{\sigma_0 s_0^2}{2}} \tag{36}$$

It then follows that $\frac{\partial \text{Labor share}_0}{\partial \sigma_1} < 0$. □

Proof of Proposition 8. Suppose that $\pi(s_0, w_0^*) = 0$. While π-investors would pay zero for an inflexible firm, s-investors would be willing to pay up to $\beta s_0 > 0$. Thus, only s-investors buy shares in inflexible firms in equilibrium and $\pi(s_0, w_0^*) < 0$. These investors are in excess supply and will thus pay to the entrepreneur $\rho_2(s_0, w_0^*) = \beta s_0 + (1-\beta)\pi(s_0, w_0^*)$ for each share. Competition among inflexible entrepreneurs should drive their profits from selling shares to zero: $e_2(s_0, w_0^*) = 0$, implying $\pi(s_0, w_0^*) = -\frac{\beta s_0}{1-\beta}$ and $w_0^* = \frac{\beta s_0}{1-\beta} + y - \frac{\sigma_0 s_0^2}{2}$. □

Proof of Proposition 9. Simple algebra shows that

$$v(a,0) = y - w_0 - a s_0 + \frac{a^2}{2\sigma_1}, \tag{37}$$

$$v(a,b) = v(a,0) - \beta\left(\frac{a^2}{2\sigma_1} - \frac{(1+\sigma_1 s_0)}{\sigma_1}a + y - w_0 - \frac{b}{2\sigma_1}\right). \tag{38}$$

Equation (38) shows that the difference $v(a,b) - v(a,0)$ is a quadratic and concave function of a, with roots

$$\{a^-, a^+\} \equiv (1+\sigma_1 s_0) \pm \sqrt{(1+\sigma_1 s_0)^2 + b - 2\sigma_1(y - w_0)}. \tag{39}$$

Replacing $w_0^* = b s_0 + y - \frac{\sigma_0 s_0^2}{2}$ (From Proposition 8) in (39) proves the result. □

Proof of Proposition 10. Part (i) follows from Corollary 1. Part (ii) follows because, after investment $e_1(s,w)$ is made, all flexible firms can be sold for $e_2(s,w) = v(k') > 0$, while inflexible firms are sold for $e_2(s,w) = 0$. To prove part (iii), note first that inflexible firms cost bs_0 and return $-bs_0$ in profit (see Proposition 8). Thus, investors in such firms obtain a -100% return, i.e., they lose all their (financial) investment. For flexible firms, we have both π-investors and s-investors. π-investors always get zero return (which is the fair risk-adjusted return), otherwise, they do not invest. s-investors earn negative returns, which can be no lower than -100%. $\square$

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School of Economics and Finance
Queen Mary University of London
Mile End Road
London E1 4NS
Tel: +44 (0)20 7882 7356
Fax: +44 (0)20 8983 3580
Web: www.econ.qmul.ac.uk/research/workingpapers/