A joint Initiative of Ludwig-Maximilians-Universität and Ifo Institute for Economic Research

Working Papers

EQUILIBRIUM UNEMPLOYMENT AND CREDIT MARKET IMPERFECTIONS: THE CRITICAL ROLE OF LABOUR MOBILITY

ERKKI KOSKELA
RUNE STENBACKA

CESifo Working Paper No. 654 (4)

January 2002

Category 4: Labour Markets

CESifo
Center for Economic Studies & Ifo Institute for Economic Research
Poschingerstr. 5, 81679 Munich, Germany
Phone: +49 (89) 9224-1410 - Fax: +49 (89) 9224-1409
e-mail: office@CESifo.de
ISSN 1617-9595

CESifo *Working Paper No. 654*
January 2002

EQUILIBRIUM UNEMPLOYMENT AND CREDIT MARKET IMPERFECTIONS: THE CRITICAL ROLE OF LABOUR MOBILITY

Abstract

We investigate the interaction between labour and credit market imperfections for the determination of equilibrium unemployment within the framework of the "right-tomanage" approach. Our analysis highlights the critical role of labour mobility for the evaluation of the employment implications of intensified credit market competition. Without labour mobility increased bargaining power of banks will have adverse employment effects. However, with a labour force mobile across industries this relationship is frequently reversed if firms adopt profit sharing schemes. If employment at a fixed wage complements unemployment benefits to constitute the trade union's relevant outside option, intensified credit market competition will increase equilibrium unemployment. This relationship is shown to hold also for cases where the outside option incorporates profit sharing schemes as long as the labour market imperfections – measured by the relative bargaining power of the trade unions - are sufficiently strong.

JEL Classification: J51, J41, G32

Keywords: wage and loan bargaining, compensation systems, equilibrium unemployment, outside options.

Erkki Koskela
Department of Economics
P.O.box 54 (Unioninkatu 37)
00014 University of Helsinki
Finland
erkki.koskela@helsinki.fi

Rune Stenbacka
Swedish School of Economis
P.O. Box 479
00101 Helsinki
Finland

I. Introduction

European unemployment rate has shown a rising trend during the last twenty-five years. This has raised the question of how to explain this development. Without going explicitly into that issue, which is still partly unresolved, one should notice that at the moment there are several complementary approaches to study and explain high European unemployment. In this context various versions of the union bargaining theory have been quite popular. This is natural as in most European countries over three quarters of the workforce are still covered by collective bargaining.

In the present study we examine the interaction of labour and credit market imperfections for the determination of equilibrium unemployment within the framework of the "right-to-manage" approach. In the credit market loan contracts are negotiated between financiers and firms, both possessing bargaining power, whereas the firms and organized labour bargain over the base wage in the imperfectly competitive labour market. These two types of negotiations take place sequentially and are assumed to be conditional on the firm having committed itself to the form of wage contract determining to what extent it makes use of performance-related profit sharing in addition to the negotiated base wage**.** More specifically, we study the impact of alternative outside options – largely related to labour force mobility - for the relationship between credit market competition and equilibrium unemployment.

An emerging literature has focused on the interaction between corporate finance, wage and employment policies. Bronars and Deere (1991), Perotti and Spier (1993) as well as Dasgupta and Sengupta (1993) demonstrate how firms can use debt as a strategic instrument to reduce the costs that unionized workers can impose on shareholders through their collective bargaining power. Koskela and Stenbacka (2000c) develop a unified framework to simultaneously deal with the determination of wages, employment, employee effort, profit sharing and the choice of capital structure by firms. However, they do not fully analyze the interaction between the labour and credit markets, because the determination of the interest rate in the credit market is not endogenized.

The literature focusing on the interaction between credit and labour markets, both characterized by market imperfections, is currently quite thin. Wasmer and Weil (2000) investigate this issue within the framework of a model with job search, credit matching frictions and negotiated mark-ups in the labour and credit markets. Their model generates a decompostion of unemployment into two parts, one depending on labour market imperfections and the other one depending on credit market imperfections. These imperfections exhibit interaction in the form of a credit multiplier such that the credit market imperfections amplify the unemployment generated through the imperfections in the labour market.[1] Acemoglu (2001) presents another mechanism for how credit market frictions may contribute to unemployment. Abstracting from labour market imperfections he demonstrates how failures in the credit market to channel funds to socially valuable projects can have a substantial impact on unemployment, in particular in the "medium" run.

Our present analysis makes it possible to characterize the relationship between equilibrium unemployment and the competitiveness of the credit market for environments where firms apply performance-related wage contracts relying on profit sharing. We study the important issue of how this relationship depends on labour mobility, which plays a major role in determining the nature of outside options relevant for the labour market negotiations. In our framework the presence of a performance-related wage component in the form of profit sharing is a necessary condition for the relationship between the competitiveness of the credit market and equilibrium unemployment.[2] We confirm the intuitively appealing conjecture that intensified credit market competition will promote employment under two distinct types of circumstances: (1) a labour force which is perfectly immobile across industries or (2) a labour force which is mobile across industries which all adopt profit sharing as long as labour markets exhibit sufficiently small bargaining power of trade unions and face policies with sufficiently high benefit-replacement ratios.

---

[1] Our model differs in several respects from that of Wasmer and Weil (2000). Firstly, our results heavily depend on the general equilibrium analysis, which is important, because, in contrast to studies based on a partial equilibrium analysis, wage increases affect the outside option available to union members. Secondly, we operate with more general wage contracts. In fact, most of the analysis in Wasmer and Weil is restricted to exogenous base wages with no performance-related elements.

[2] Under perfectly competitive credit markets the equilibrium unemployment is independent of the credit market characteristics, because under such conditions the firm finds it optimal not to adopt profit sharing.

However, with a labour force mobile across industries this relationship is reversed if employment at a *fixed* wage complements unemployment benefits to constitute the trade union's relevant outside option. Then intensified credit market competition will always increase equilibrium unemployment. This relationship can be shown to hold also for cases where the outside option incorporates profit sharing schemes as long as the labour market imperfections – measured by the relative bargaining power of the trade unions - are sufficiently strong.

This seemingly paradoxical result - that intensified credit market competition might increase equilibrium unemployment - can intuitively be explained by reference to an "outside option effect". A decrease in the repayment rate directly improves employment conditions, but it also induces a wage rise with the opposite effect. Moreover, labour force mobility induces the value of the trade union's outside option to increase so as to outweigh the increased direct cost of financing. Finally, a lower degree of market imperfections in the credit market will induce lower profit shares. Even though lower profit shares will have no direct employment effect, they will depress employment by increasing the negotiated base wage.

Our analysis proceeds as follows. In section II we present the basic structure of the model including the time sequence of decisions under circumstances where a representative firm operates in an environment characterized by uncertainty and thereby bankruptcy risk. Employment is studied in section III, while in section IV we explore the determination of the repayment rate as well as the base wage through a process of Nash bargaining in the credit and labour markets, respectively. Section V explores the implications of credit market imperfections for equilibrium unemployment under circumstances where labour mobility across industries, and thereby the outside options relevant for wage negotiations, vary. Finally, we summarize and offer concluding comments in section VI.

II. The Basic Framework

We consider a financially constrained firm operating in an environment characterized by uncertainty. Production requires the firm to employ homogeneous workers within the framework of a unionized labour market. By employing labour input L the firm is able

to generate random revenues, γ, which are distributed continuously with $\gamma > 0$ according to the conditional density function[3]

$$(1) \qquad f(\gamma \mid L) \quad = \quad \lambda(L) e^{-\lambda(L)\gamma} \quad ,$$

where $\lambda'(L) < 0$ and $\lambda''(L) > 0$. Thus, a rise in L will shift density to higher returns at a decreasing rate.

In order to focus on the interaction between imperfections in credit markets and labour markets we assume that the firm has to finance its operations exclusively by debt. For a firm facing a credit market with a prevailing interest rate r, the effective labour cost can be written as $(1+r)w = \Delta w = \tilde{w}$, where Δ is the repayment rate.[4] Faced with an ordinary debt contract exhibiting limited liability, the risk-neutral firm decides on the level of employment L in order to maximize its expected profits, $E\pi$, defined by

$$(2) \qquad E\pi(L) \quad = \quad \int_{\hat{\gamma}}^{\infty} (\gamma - \tilde{w}L)\, f(\gamma \mid L)\, d\gamma \quad = \quad \frac{e^{-\lambda(L)\hat{\gamma}}}{\lambda(L)} \quad .$$

For the derivation of the RHS expression of (2) we have applied integration by parts and used the specification (1). In (2) the lower bound of the range of integration $\hat{\gamma} = \tilde{w}L$ denotes the "break-even" state of nature, in which the firm is just able to remain solvent. The workers must be paid prior to production and the generated conditional revenues are either sufficient to make the firm survive or not. According to (2) the firm's attention is restricted to the upper tail of the distribution of project returns $(\gamma \geq \hat{\gamma})$, while ownership of the project shifts to the bank in case the firm cannot fulfill its contractual obligation. Thus, the firm is bankrupt when $\gamma < \hat{\gamma}$.

In the long run the firm commits itself to the form of the wage contract delineating to what extent it will make use of performance-related profit sharing. The profit share, τ, determines what fraction of the firm's profits will be transferred to employed workers as

[3] This kind of specification in a more general form has been used in Koskela – Stenbacka (2000a).

part of the contract. Conditional on the structure of compensation to organized labour the firm and the trade union engage in wage bargaining. The firm-union negotiations at this stage determine the base wage, w, to be paid to all workers employed by the firm as the outcome of Nash bargaining. Conditional on the outcome of the wage bargaining, in its turn, the firm and the bank negotiate over the firm's repayment rate $\Delta = 1 + r$. Together with the negotiated base wage this repayment rate determines the effective cost of production for the firm. We again apply the Nash bargaining solution as the outcome of the firm-financier negotiations determining the firm's cost of debt financing. Finally, the firm unilaterally decides on employment once the negotiations in the labour and credit markets are settled. This sequential bargaining - with sequential separation of the negotiations in the labour and credit markets - seems to us not only natural but also essential for our purpose of studying the impact of the interaction between labour and credit markets on equilibrium unemployment.

We summarize the time sequence of the decisions made by the firm, the financier and the trade union in Figure 1. We proceed by applying backward induction and thereby solving the game in reverse order by starting to investigate the determination of employment in the next section.

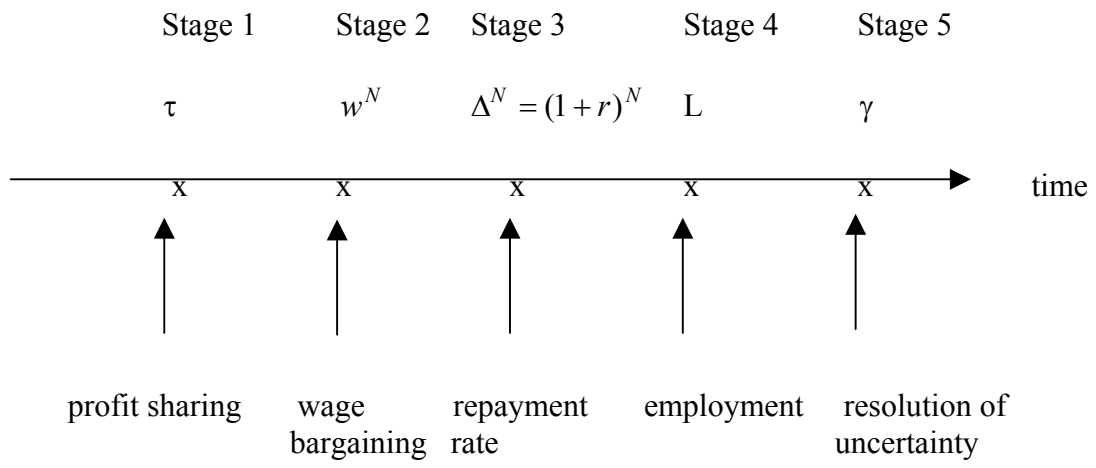

Figure 1: Time sequence of decisions

[4] In principle, the analysis could be extended to more general capital structures meaning that the firm would have to finance the fraction δ $(0 \leq \delta \leq 1)$ of labour costs by debt. In such a generalized case the

III. Employment Determination

At this stage the firm has committed itself to a profit sharing system and the negotiations in the labour and credit markets have fixed the base wage and the repayment rate. Thus**,** the effective cost of employing L workers can be expressed as $w\,\Delta L$, thereby exhibiting a straightforward dependence on the negotiated base wage and repayment rate, respectively. In order to simplify the presentation we make the following assumption[5] regarding the production technology.

Assumption 1: The hazard rate function $\lambda(L)$ is assumed to satisfy

(A1) $$\lambda(L) = \frac{\alpha}{L^{\alpha}} \qquad \text{with } 0 < \alpha < 1.$$

Assumption (A1) implies that $\lambda'(L) = -\alpha^2 / L^{\alpha+1} < 0$ and $\lambda''(L) = \alpha^2(\alpha+1) / L^{\alpha+2} > 0.$ so that an increase in employment shifts the density to higher returns at a decreasing rate. To investigate the firm's optimal employment determination we differentiate (2) with respect to L to obtain the first-order condition

(3) $$-\lambda'(L)\left[1 + \lambda(L)\hat{\gamma}\right] - \lambda(L)^2 \tilde{w} = 0.$$

Using the specification (A1) for $\lambda(L)$ we can explicitly express the firm's optimal employment L^*

(4) $$L^* = \tilde{w}^{-\eta}\,\eta^{\eta},$$

where $\eta \equiv \frac{1}{1-\alpha}$ is the elasticity of employment with respect to the effective wage rate $\tilde{w} = \Delta w$. According to (4) the firm's optimal employment exhibits constant elasticity with respect to the wage and the repayment rates. Further, to the extent that an increased

---

effective labour cost could be written as $(1-\delta)w + \delta(1+r)w = (1+r\delta)w = \Delta(\delta)w = \tilde{w}$**.**

[5] In what follows the derivatives are noted by primes for functions with one argument and the partial derivatives by subscripts for functions with many arguments. Hence for example $\lambda'(L) = d\lambda(L)/dL$, while $A_x(x,y) = \partial A(x,y)/\partial x,$ etc.

interest rate contributes to the firm's leverage, (4) suggests that the higher is the firm's leverage rate, the lower is employment, ceteris paribus. Notice also that labour demand does not depend directly on the profit sharing parameter τ.[6] Substituting the optimal employment (4) into the firm's expected profit function yields the following expected indirect profit function

$$(5) \qquad E\pi^*(\Delta) = \frac{e^{-\lambda(L^*)\hat{\gamma}}}{\lambda(L^*)}.$$

As the negotiating parties in the credit and labour markets anticipate the firm's employment decision, (5) is the relevant profit expression for the subsequent bargaining analyses.

IV. Nash Bargaining in the Credit and Labour Markets

We now turn to the analysis of the second stage of the game, the determination of the cost of external funds, captured by the repayment rate, Δ, in the credit market.

IV. 1. Repayment Rate Bargaining

In the literature there is no unique and standardized way to characterize the intensity of lending rate competition. In traditional oligopoly models the consequences of increased competition are often analyzed by increasing the number of competing lenders. Another approach, frequently applied in the area of industrial organization, is to measure the intensity of competition by the degree of product differentiation like, for example, in the Hotelling type models of horizontal product differentiation. A third way of capturing the degree of credit market imperfections is to identify these with the lender's bargaining power relative to that of the borrower, i.e. to apply the Nash bargaining approach. This is the approach we will apply in the present analysis.[7] For our purposes this approach

[6] Empirical evidence from USA (see e.g. Sharpe (1994) and Hanka (1998)), from UK (see e.g. Nickell and Wadhwani (1991) and Nickell and Nicolitsas (1999)) as well as from Germany (see e.g. Funke, Maurer and Strulik (1999)) lies in conformity with the prediction that the firm's leverage will have a negative effect on employment. Moreover, direct independence of employment also lies in conformity with empirical evidence from UK (see Wadhwani and Wall (1990)) and France (see Cahuc and Dormont (1997)).

[7] For applications of the Nash bargaining approach to analyze lending martket competition in slightly different contexts we refer to Koskela and Stenbacka (2000b), Besci and Li and Wang (2000) and Wasmer and Weil (2000). See also Bester (1995), who has analyzed the foundations of loan contracts by ref-

has two advantages: it both incorporates the polar market structures of monopoly and perfect competition as special cases and it avoids incorporation of market-specific, and often controversial, institutional details (like the precise type of competition) of credit markets as a part of the analysis.

The financier of the firm's project, the bank, is assumed to be risk-neutral and we express its expected profit function as

$$(6) \qquad EB(\Delta) \quad = \quad wL^{*}\left[\Delta(1-F(\hat{\gamma}\,|\,L^{*}))-1\right] + \quad (1-h)\int_{0}^{\hat{\gamma}}\gamma\ f(\gamma\,|\,L^{*})\,d\gamma \quad ,$$

where the first term describes the bank's expected profits (net of funding costs) in states of nature where the firm remains solvent, while the second term delineates the expected profits accruing to the bank when bankruptcy occurs. The first term incorporates a normalization whereby the bank's opportunity cost of granting finance is zero. The parameter h denotes the bankruptcy costs capturing the idea that it may be costly to liquidate a project failing to fulfill the repayment obligation determined by the debt contract. In particular, h=0 covers the limiting case of a perfectly liquid project which would have the same value to outsiders as to the firm, while h=1 covers the limiting case of infinitely high bankruptcy costs.[8]

The combination of (2), whereby the base wage to unionized workers is paid prior to production, and (6) means that workers have priority claims relative to banks in case bankruptcy occurs. But, on the other hand, as a residual claimant relative to the "break-even" state of nature, the bank has priority relative to performance-related components in the compensation scheme offered to workers.

Using integration by parts we can re-write the expected profit function of the financier as follows

$$(7) \qquad EB(\Delta) \quad = \quad wL^{*}\left[\Delta\, x(h,\eta)-1\right] \ ,$$

---

erence to a process of bilateral bargaining in a financial market where the investor delegates the activities of searching for investment projects and bargaining with the entrepreneur to a financial intermediary.

[8] For an illuminating general discussion of different approaches to bankruptcy procedures and bankruptcy costs we refer to Hart (2000).

where $x(h,\eta)$ is defined by $x(h,\eta) = h e^{1-\eta} + \frac{1-h}{\eta-1}(1-e^{1-\eta})$ and where $1-F(\hat{\gamma}) = e^{-\lambda(L^*)\hat{\gamma}} = e^{1-\eta}$ denotes the probability of the firm remaining solvent. Thus, the bank's expected profit is an increasing function of the probability of solvency as long as bankruptcy costs, h, are not too small.[9]

The repayment is assumed to be determined as the outcome of bargaining between the financier and the firm subject to the constraint that the firm unilaterally decides the level of employment in line with the well-established "right-to-manage" approach.[10] We further assume that the zero expected profits represent the threat point of both the firm and the financier. In such a situation the determination of Δ can be modeled as the solution to the following Nash bargaining problem

$$(8) \qquad Max_{\Delta}\ \Psi(\Delta) \quad = \quad \left[EB(\Delta)\right]^{\mu}\left[E\pi^{*}(\Delta)\right]^{1-\mu} \quad s.t. \quad E\pi^{*}_{L} = 0\ ,$$

where μ and $1-\mu$ denote the relative bargaining power of the financier and the firm, respectively. The first-order condition for this bargaining problem can be expressed as[11]

$$(9) \qquad \mu\,\frac{EB_{\Delta}}{EB} \quad + \quad (1-\mu)\,\frac{E\pi^{*}_{\Delta}}{E\pi^{*}} \quad = \quad 0\ .$$

As the firm unilaterally optimizes employment, we can apply the envelope theorem to see that $E\pi^{*}_{\Delta} = -wL^{*}(1-F(\hat{\gamma})) = -wL^{*}e^{-\lambda(L^*)\hat{\gamma}} < 0$. For the effect of the repayment rate on the expected profit of the bank we have $EB_{\Delta} = \frac{wL^{*}}{\Delta}\left[\eta + \Delta\, x(h,\eta)(1-\eta)\right]$. From the optimal labour demand (4) we get the result that the probability of solvency for the

[9] With very small bankruptcy costs the bank would, in fact, have an incentive to "go for the broke". Such a possibility is discussed in Hart (2000). Intuitively it emerges as a consequence of the fact that in the presence of small bankruptcy costs liquidation of the project would yield a high return to the bank.

[10] Here we follow the 'right –to-manage' approach in the credit market negotiations. While it is common in the analyses of labour markets, one can ask how well it fits credit markets. Concerning credit markets this is a subject for further research.

firm is determined by $(1-F(\hat{\gamma}|L^*)) = e^{1-\eta}$, which is constant and *independent* of the effective wage rate $\tilde{w} = \Delta w$.[12] Combining these formulations we can re-express the first-order condition, (9) so as to find the Nash bargaining solution

$$(10) \qquad \Delta^N = \left[\frac{\mu+\eta-1}{\eta-1}\right]\frac{1}{x(h,\eta)} \quad .$$

Remembering that $x(h,\eta) = h e^{1-\eta} + \frac{1-h}{\eta-1}(1-e^{1-\eta})$ we can conclude from (10) that the negotiated repayment rate depends on four factors: (i) the firm's probability of solvency ($e^{1-\eta}$), (ii) the elasticity of labour (and debt) demand (η), (iii) the bankruptcy costs (h) and (iv) the relative bargaining power of the financier (μ). The repayment rate depends positively on the relative bargaining power of the financier, the bankruptcy costs and on the probability of bankruptcy ($F(\hat{\gamma}|L^*) = 1-e^{1-\eta}$) in the realistic case where the bankruptcy costs are not too small.

We summarize our analysis of the bargaining taking place in the credit market in

Proposition 1 *The Nash bargaining repayment rate given by (10) depends positively on the relative bargaining power of the bank as well as on the bankruptcy costs. Further, it is positively related to the bankruptcy risk of the project as long as the bankruptcy costs are not too small.*

It is worth emphasizing that due to the constant effective wage elasticity of labour demand the Nash bargaining solution (10) is *independent* of the wage rate w, and thereby of the relative bargaining power of the labour market participants.

---

[11] We assume that the sufficient second-order condition for the Nash bargaining problem holds.

[12] Proof: Substituting the labour demand and the specification for $\lambda(L)$ for the expression of the probability of solvency gives $(1-F(\hat{\gamma})) = e^{-\lambda(L)\hat{\gamma}} = e^{-\frac{\alpha\tilde{w}^{1-\eta}\eta^{\eta}}{\tilde{w}^{-\alpha\eta}\eta^{\alpha\eta}}} = e^{1-\eta}$. Q.E.D.

IV. 2. Nash Bargaining and Wage Structure

We now turn to analyze the wage negotiations between the union and the firm, both possessing market power. In the wage negotiations the firm and union take the profit share τ as given and behave in anticipation of optimal employment determination as well as the subsequently negotiated bargaining outcome regarding the repayment rate in the credit market.

IV.2.1. Wage Bargaining

We write the linear utilitarian objective function of the trade union as

$$E\hat{U}(w) \quad = \quad L^* \left[\quad w \; + \; \frac{\tau}{L^*} \; E\pi^* \quad \right] \; + \; (N - L^*)\, b \,,$$

where the first term captures the rent to the employed and the second term that to the unemployed union members. With probability $F(\hat{\gamma} \big| L^*)$ the firm confronts bankruptcy, in which case the worker receives nothing on top of the base wage. The base wage is paid out prior to resolution of the uncertainty. With the complementary probability, $1 - F(\hat{\gamma} \big| L^*)$, the firm remains solvent and the employed union member is remunerated according to the compensation contract, i.e. the sum of the base wage, w, negotiated with the firm and the share of the profit realization, τ / L^*, determined by the firm. Note that these probabilities are incorporated in the objective function of the union through the expected profits $E\pi^*$. The parameter b denotes the trade union's outside option.

We denote the relative bargaining power of the union by β, and, consequently, that of the firm by $(1-\beta)$, and assume that the threat points of the trade union and the firm can be described by $EU^o = Nb$ and $E\pi^o = 0$, respectively. Applying the Nash bargaining solution the negotiating parties decide on the base wage w in order to maximize

$$(11) \qquad Max_w \; \Omega(w) \quad = \quad \left[EU(w)\right]^{\beta} \left[(1-\tau) E\pi^*(w)\right]^{1-\beta} \quad s.t. \; \Psi_{\Delta} = E\pi^*_L = 0 \;,$$

where $EU = E\hat{U} - EU^o = L^*\left[(w-b) + \frac{\tau}{L^*}E\pi^*\right]$ and $E\pi^* = e^{1-\eta}/\lambda(L^*)$. The Nash bargaining solution satisfies the following first-order condition[13]

$$(12) \qquad \Omega_w = 0 \Leftrightarrow \beta\frac{EU_w}{EU} + (1-\beta)\frac{E\pi^*_w}{E\pi^*} = 0 .$$

Differentiating the expected profit function of the firm we find that $E\pi^*_w = -\frac{e^{1-\eta}\lambda'(L^*)L^*_w}{\lambda(L^*)^2} = -\frac{e^{1-\eta}(\eta-1)}{w\lambda(L^*)} < 0$ so that $\frac{E\pi^*_w}{E\pi^*} = -\frac{(\eta-1)}{w} < 0$. For the trade union we get $EU_w = \frac{L^*}{w}\left[w(1-\eta) + b\eta + \frac{\tau}{L^*}(1-\eta)E\pi^*\right] > 0$. Utilizing these together with the trade union's expected rent relative to the outside option, EU^o, we can explicitly solve the first-order condition (12) with respect to the base wage. Through such a process we find the Nash bargaining solution to be given by

$$(13) \qquad w^N = \frac{\beta + \eta - 1}{\eta - 1 + \tau\,\Delta^N\,e^{1-\eta}}\,b .$$

According to (13) the negotiated wage rate is a multiple of the outside option and it depends positively on the relative bargaining power of the trade union whereas negatively on the repayment rate Δ^N as long as the firm adopts profit sharing. Hence the interest rate r (and also the leverage rate δ if that were explicitly included) will have wage-moderating effects, which, however, disappear in the absence of profit sharing.[14] Further, we can conclude that the negotiated wage depends negatively on the expected profit share, i.e. the product of the probability of solvency, $e^{1-\eta}$, and the profit share, τ. Moreover, in the presence of profit sharing the Nash bargaining solution is negatively related to the relative bargaining power of the financier, μ.

We summarize our characterization of the negotiated base wage in

---

[13] We assume that the sufficient second-order condition for the Nash bargaining problem holds.

[14] This lies in conformity with the econometric evidence, based on panel data on a large number of UK companies, reported in Nickell and Nicolitsas (1999).

Proposition 2 *In the presence of profit sharing the Nash bargaining the wage rate is decreasing as a function of the repayment rate, the expected profit share and the relative bargaining power of the financier, while it is increasing as a function of the relative bargaining power of the trade union and likewise of the probability of bankruptcy, if the bankruptcy costs are not too small.*

Hence the negotiated wage is negatively related to the intensity of competition prevailing in the credit market (in the sense of lower μ) when wage contracts incorporate a performance-related component in the form of profit sharing.

IV.2.2. Determination of Profit Sharing

Performance-related compensation is a common phenomenon in industrialized economies. For example, in Finland The Confederation of Finnish Industry and Empoyers conducted a survey in 1999 and found that more than 50 percent of all its member firms apply performance-related compensation schemes. Profit sharing refers to renumeration mechanisms where the traditional fixed-wage remuneration is replaced by a scheme with a fixed base wage plus a share of profits or revenues of firms. For similar evidence regarding the frequency of profit sharing in, for example, U.K. and France we refer to Wadhwani and Wall (1990) and Cahuc and Dormont (1997). For a more extensive survey of why firms might adopt profit sharing plans we refer to Kruse (1996). Weitzman (1985) argues that the profit sharing system leads to better business cycle performance when compared to a fixed wage system and conjectures that profit sharing systems will also reduce equilibrium unemployment (Weitzman 1987).

Our analysis now proceeds to the first stage of the game in order to analyze the firm's optimal commitment to the wage structure in the form of a profit share. As we have seen in the previous sections the profit share will subsequently impact on the negotiated wage and thereby on employment. The firm's optimal decision with respect to the profit share has to take these effects into account.[15]

[15] A number of contributions to the literature on wage bargaining, for example, Jerger and Michaelis (1999), Holmlund (1991), Pohjola (1987) and Anderson and Devereux (1989) have analyzed profit sharing within a framework where the union-firm negotiations include profit shares in addition to base wages. In this literature the profit shares are determined simultaneously with base wages, a feature which can be questioned on grounds of realism. For example, in Finland the Confederation of Finnish Industry and

The firm decides on the profit share in order to solve the following optimization problem

$$(14) \qquad Max_{\tau}\ (1-\tau)\, E\pi^{*} \quad = \quad (1-\tau)\,\frac{e^{-\lambda(L^{*})\hat{\gamma}}}{\lambda(L^{*})} \qquad \text{s.t. } \Omega_{w} = \psi_{\Delta} = E\pi^{*}_{L} = 0\ ,$$

where $L^{*} = \left[w^{N}\Delta^{N}\right]^{-\eta}\eta^{\eta}$ and $\hat{\gamma} = w^{N}\Delta^{N}L^{*}$. The first-order condition for an optimal profit share is

$$(15) \qquad \underbrace{-E\pi^{*}(w^{N},\Delta^{N})}_{-} \quad + \quad \underbrace{(1-\tau)\,E\pi^{*}_{w}\frac{\partial w^{N}}{\partial\tau}}_{+} \quad = \quad 0\ ,$$

where

$$(16a) \qquad E\pi^{*}_{w} \quad = \quad -\frac{e^{1-\eta}(\eta-1)}{w^{N}\lambda(L^{*})} \quad < \quad 0$$

and

$$(16b) \qquad \frac{\partial w^{N}}{\partial\tau} \quad = \quad -w^{N}\,\frac{e^{1-\eta}\ \Delta^{N}}{\eta-1+\tau\ e^{1-\eta}\ \Delta^{N}} \quad < \quad 0.$$

The first-order condition (15) exhibits that the optimal profit share is determined so that the negative dilution effect (the first term) is counterbalanced by the positive wage-moderating effect of the profit share τ (the second term).

Substituting (16a) and (16b) into (15) and rearranging gives the following explicit interior solution for the optimal profit share

$$(17) \qquad \tau^{*} = \quad \frac{(\eta-1)}{\eta}\left[\frac{e^{1-\eta}\ \Delta^{N}-1}{e^{1-\eta}\ \Delta^{N}}\right]\ .$$

One can see that profit sharing is adopted by the firm if $e^{1-\eta}\ \Delta^{N} > 1$. Using (10) for the repayment rate Δ^{N} we can define the value of the critical bankruptcy cost h^{*} for which

---

Employers has declared publicly that it does not negotiate regarding performance-related compensation schemes.

the optimal profit sharing is zero. It can be defined as $x(h^*) = \frac{\mu + \eta - 1}{\eta - 1} e^{1-\eta}$ and because $\frac{\partial \tau^*}{\partial h} = \frac{\partial \tau^*}{\partial \Delta^N} \frac{\partial \Delta^N}{\partial h} > 0$ profit sharing is utilized if $h > h^*$ so that higher bankruptcy costs make it more likely that the firm will adopt profit sharing. Such a relationship between profit sharing and bankruptcy costs appeals to intuition, since higher bankruptcy costs increase the negotiated interest rate, which enhances the incentives to adopt profit sharing. In the limiting case with infinitely high bankruptcy costs we can write the optimal profit share as

$$\tau^*\big|_{h=1} = \frac{\eta - 1}{\eta} \frac{\mu}{\mu + \eta - 1} \quad . \tag{18}$$

First, according to (18) the adoption of profit sharing requires a positive relative bargaining power of the financier. In the case of perfect competition in the credit market the optimal profit sharing is zero and the interaction between labour and credit markets will then disappear under our assumed production function (A1). This is a natural feature because then the profit share does not have wage-moderating effects so as to offset the dilution effect. Thus, the optimal profit share increases with the relative bargaining power of the financier, because the induced base wage moderation increases the firm's incentives to use profit sharing. Secondly, the firm's incentives to use of the profit sharing instrument is not affected by the degree of competition in the labour market, because the repayment rate (10) is independent of the wage rate.[16]

We summarize our findings of this section in

Proposition 3 *The optimal profit share is increasing as a function of the relative bargaining power of the bank in the credit market, while independent of the bargaining power of the firm in the labour market. Higher bankruptcy costs increase the likelihood and degree of profit sharing. Finally, for a competitive credit market the firm finds it optimal not to adopt the profit sharing instrument.*

[16] This is because in our model the wage elasticity of labour demand is constant due to the assumption of the Cobb-Douglas production function . In more general cases this might not hold.

Thus, higher bargaining power of the lender induces a shift towards a higher degree of performance-related pay. Such a higher profit share will generate a moderation of base wages and thereby affect employment.

V. Equilibrium Unemployment with Credit Market Imperfections: The Role of Labour Mobility

After having studied the interaction between the determination of the wage structure and the repayment rate conditional on labour demand we now integrate the elements developed so far in order to explore the relationship between total employment and imperfections in the labour and credit markets, measured by the relative bargaining powers of the negotiating parties. Earlier we observed that imperfections in the labour and credit markets might have opposite effects on the negotiated base wage if the workers have access to an exogenous outside option. The negotiated base wage was found to be an increasing function of the trade union's relative bargaining power, whereas a decresing function of the bank's relative bargaining power in the credit market as long as profit sharing schemes are adopted.

V.1. Immobile Labour: Unemployment Benefit as the Outside Option

Let us first consider the role of the degree of credit market imperfection, measured by the relative bargaining power of the financier, μ for employment when labour is immoble across industries. If labour is completely immobile across industries, exogenous unemployment benefits constitute the relevant outside option for workers at the stage of wage negotiations. For such a case the employment effect of a change in μ can be expressed as

$$(19) \qquad \frac{dL}{d\mu} = \underbrace{L_{\tilde{w}}\, w^N \left[\frac{\partial \Delta^N}{\partial \mu}\right]}_{-} + \underbrace{L_{\tilde{w}}\, \Delta^N \left[\frac{\partial w^N}{\partial \mu} + \frac{\partial w^N}{\partial \tau^*}\frac{\partial \tau^*}{\partial \mu}\right]}_{+}.$$

An increase in the relative bargaining power of the financier influences employment in three different ways. Firstly, there is the direct effect, whereby the employment falls as a consequence of an increase in the negotiated repayment rate factor (the first term on

the RHS). In addition, there are two offsetting effects operating through the mechanism for wage formation. The negotiated wage rate is moderated secondly, directly through an induced reduction in the base wage and thirdly, indirectly via an induced increase in the profit share. Both of these effects stimulate employment (the second term on the RHS).

Substituting the relevant expressions into (19) and rearranging gives

$$(20) \qquad \frac{dL}{d\mu} = \frac{w L_{\tilde{w}}}{\eta - 1 + \tau\, e^{1-\eta} \Delta^N} \left(\frac{\eta - 1}{\eta} \frac{1}{x(h,\eta)} \right) < 0 .$$

Therefore, despite the offsetting effects we can conclude that the direct effects of a change in the relative bargaining power of the bank dominate the indirect effects via the wage and profit share determination independently of the relative size of the bargaining power of trade union in the labour market. Consequently, with a perfectly immobile labour force with the exogenous outside option it holds that more intense competition in the credit market unambigously generates lower unemployment.[17]

Thus, we can summarize our finding regarding the relationship between the competitiveness of the credit market and the equilibrium unemployment in the absence of labour mobility in

Proposition 4 *With a perfectly immobile labour force intensified credit market competition will lower equilibrium unemployment by inducing higher wages as long as firms apply performance-related wage contracts.*

V.2. Mobile Labour: Outside Options with No Profit Sharing

Next we investigate how credit and labour market imperfections will impact on equilibrium unemployment from a perspective where labour is mobile across industries. In this respect we separate the cases where outside industries apply compensation schemes incorporating base wages alone from cases where the relevant outside option additionally

includes profit shares. Initially we focus on the case where base wages offered in other industries constitute the relevant outside option to reflect a case where profit sharing schemes are rare.

According to (13) for each representative industry the wage-determining Nash bargaining solution has the form

(21) $$w_i^N = \mathrm{A}_i \, b$$

with $\mathrm{A}_i = \dfrac{\beta + \eta - 1}{\eta - 1 + \tau \, \Delta^N e^{1-\eta}}$, where, in principle, the variables on the RHS are industry-specific. We assume that all industries are identical in the sense that $A_i = A$. In a general equilibrium context the term b could, in line e.g. with Jerger and Michaelis (1999), be interpreted to be the outside option given by

(22) $$b = (1-u)w + uB \ ,$$

where u denotes the unemployment rate, B the unemployment benefit and w is the negotiated wage rate in all the identical industries (for a standard justification of this interpretation we refer to Layard et.al (1991)) p. 100-101 and Nickell and Layard (1999), p. 3048-3050)). Here we have assumed that the economywide base wage and unemployment benefit are components of the outside option of relevance for the wage negotiation**.** We further restrict ourselves to the case of a constant replacement ratio $q \equiv B/w$. Combining (21) and (22) we get

(23) $$u^N = \frac{1}{1-q}\left[1 - \frac{1}{A}\right] = \frac{\beta - \tau \, \Delta e^{1-\eta}}{1-q} .$$

In the presence of profit sharing in the industry under consideration we can conclude that

[17] It could emphasized that the partial equilibrium employment effect of credit market competition is invariant to whether profit sharing is applied or not. As we can see from (20), however, profit sharing affects the magnitude of the employment effect.

$$(24) \qquad \frac{\partial u^N}{\partial \mu} = \frac{1}{(1-q)A^2}\frac{\partial A}{\partial \mu} = -\frac{e^{1-\eta}\left[\tau\frac{\partial \Delta^N}{\partial \mu}+\Delta^N\frac{\partial \tau}{\partial \mu}\right]}{1-q} < 0.$$

Hence, in a general equilibrium context with labour mobility intensified credit market competition will increase equilibrium unemployment. The economic intuition explaining this seemingly paradoxical finding goes as follows: A rise in μ will increase the repayment rate. This has two offsetting effects in a setting with labour immobility: On the one hand, the effective labour cost increases as a result of a rise in Δ and on the other hand, in the presence of profit sharing, higher Δ leads to wage moderation, which decreases the effective labour cost. In the case of immobile labour – analyzed in the earlier section - the former effect dominates and employment falls. But in the case of mobile labour wage moderation induces the value of the outside option to decrease, which tends to enhance employment. In addition, as shown in Proposition 3, a higher degree of market imperfections in the credit market will induce higher profit shares. Even though higher profit shares will have no direct employment effect (see (4)), higher profit shares will stimulate employment by reducing the negotiated base wage.[18] Altogether the outside option effect now dominates so that higher relative bargaining power of the financier in the credit market is associated with lower equilibrium unemployment.

Thus, in the presence of performance-related wage contracts we can summarize our findings regarding the relationship between the competitiveness of the credit market and the equilibrium unemployment in the following proposition.

Proposition 5 *With a mobile labour force and with profit sharing not being part of the relevant outside option, intensified credit market competition will raise equilibrium unemployment, because it induces wage-enhancing effects causing an increase in the outside option available to union members.*

It can be seen from (23) that $\partial u^N/\partial q > 0, \partial u^N/\partial \beta > 0$ and $\partial u^N/\partial \tau < 0$ Hence, the equilibrium unemployment increases with the benefit replacement ratio q and the rela

tive bargaining power of the trade union, whereas it decreases with the magnitude of profit sharing.

By substituting $\tau = 0$ into the definition of A we find equilibrium unemployment to be given by $u^N = \frac{\beta}{(1-q)[\eta - 1]}$, which is independent of the credit market characteristics. Thus, profit sharing is a necessary condition for there to be a link between credit market imperfections and equilibrium unemployment. Furthermore, by substituting $\mu = 0$ into (17) we formally find that $\tau\Big|_{\mu=0} = \frac{(1-h)\left[\eta\, e^{1-\eta} - 1\right]}{e^{1-\eta}} < 0$ so that credit market imperfections represent a necessary condition for firms to apply profit sharing in the first place.

As one can see from Propositions 4 and 5, the mechanism of profit sharing serves as the bridge between the credit and labour markets. In our model the credit market negotiations affect the wage formation and thereby equilibrium unemployment through the mechanism of rent formation, but not through the impact on the wage elasticity of employment. In the presence of profit sharing a change in the repayment rate will have a negative effect on the wage rate and thereby on equilibrium unemployment. On the other hand, in the absence of profit sharing this link between labour and credit markets disappears since the wage rate and thereby the equilibrium unemployment does not depend on the repayment rate.

V 3. Mobile Labour: Profit Sharing as Part of the Outside Option

In the previous section the outside option, characterized by (22), was designed to match an environment with industries not adopting profit sharing. However, it is possible that an industry, which makes use of profit sharing, also might induce other industries to behave in a similar way. Furthermore, the evidence, presented in section IV.2.2, regarding the frequency by which profit sharing schemes are adopted, offers additional support in favour of incorporating profit shares in the relevant outside option once the labour force is mobile. Next we turn to consider this case.

---

[18] It is important to emphasize that his feature would be further reinforced if our model would include efficiency wage considerations (like in Koskela and Stenbacka (2000c)), because in such a context higher

In a general equilibrium context with perfect labour mobility across industries the term b is now defined as

$$(25) \qquad b = (1-u)\left[w + \frac{\tau \; E\pi^*}{L} \right] + uB \, .$$

We further restrict ourselves to the case of a constant replacement ratio $q \equiv B/w$. Combining (21) and (25) the equilibrium unemployment can be expressed as

$$(26) \qquad u^N = \frac{1 - \frac{1}{A} + X \, \tau \; \Delta}{1 - q + X \, \tau \; \Delta} \quad ,$$

where $X = \dfrac{e^{1-\eta} \eta^{2}}{\eta - 1} > 0$ and where $A > 1$ describes the mark-up factor between the outside option b and the negotiated base wage w^N. Differentiating (26) with respect to the bargaining power of the financier μ - remembering that μ affects the unemployment rate through the mark-up factor A, the repayment rate Δ as well as the profit sharing τ - yields the following relationship

$$(27) \qquad \frac{\partial u^N}{\partial \mu} \left\{ \begin{matrix} > \\ = \\ < \end{matrix} \right\} 0 \quad \textit{if and only if} \quad q \left\{ \begin{matrix} < \\ = \\ > \end{matrix} \right\} g(\beta, \eta) \equiv 1 - \frac{\beta \; \eta^{2}}{(\beta + \eta - 1)(\eta - 1)} \; .$$

The function $g(\beta, \eta)$, defined in (27), is strictly decreasing as a function of β with $g_{\beta}(\beta, \eta) = -\eta^{2} / (\beta + \eta - 1)^{2} < 0$ and it satisfies the boundary conditions $g(0, \eta) = 1$ and $g(1, \eta) = -1/(\eta - 1) < 0$.

From (27) we can conclude that the impact of credit market imperfections on equilibrium unemployment is determined by the interplay between labour market institutions (captured by β), labour market policy (captured by the replacement ratio q) and market

---

profit shares would promote effort provision.

conditions (captured by η). This interplay is illustrated in Figures 2-3, which are drawn in the (q, β)- space. In Figure 2, which refers to the case with the wage elasticity of labour demand $\eta = 2$, the downward sloping line describes the locus of those (q, β)-combinations at which the equilibrium unemployment is invariant to the bargaining power of the bank**.** On the right-hand side of this line higher credit market imperfections will reduce equilibrium unemployment, whereas the reverse holds on the left-hand side. In Figure 3 we illustrate the effect of changes in the wage elasticity of labour demand (η). From Figure 3 we can conclude that more elastic labour demand induces an expansion of the region in which intensified credit market competition reduces equilibrium unemployment. This expansion continues until we approach the borderline $q = 1 - \beta$, which corresponds to the limit (and, of course, hypothetical) case of infinite labour demand elasticity.

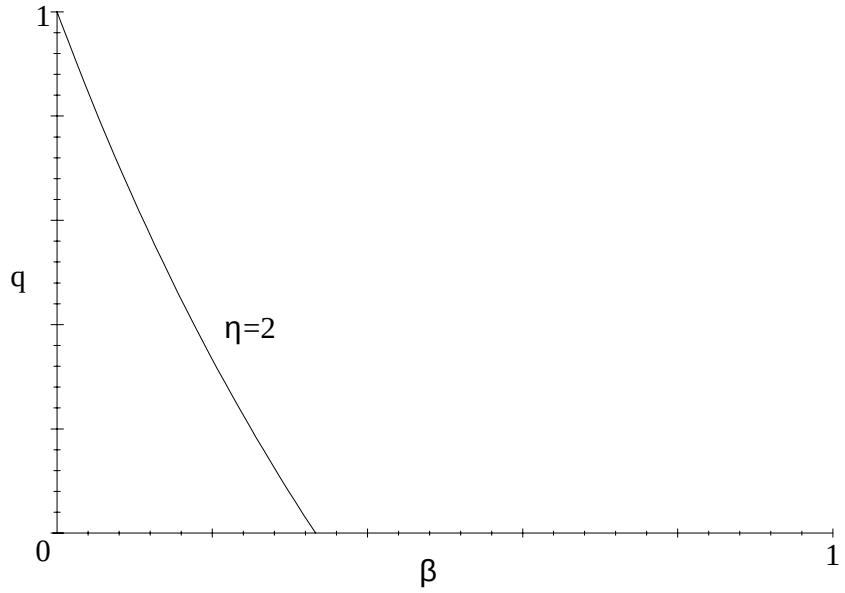

Figure 2. Equilibrium unemployment and credit market imperfections: the role of labour market variables

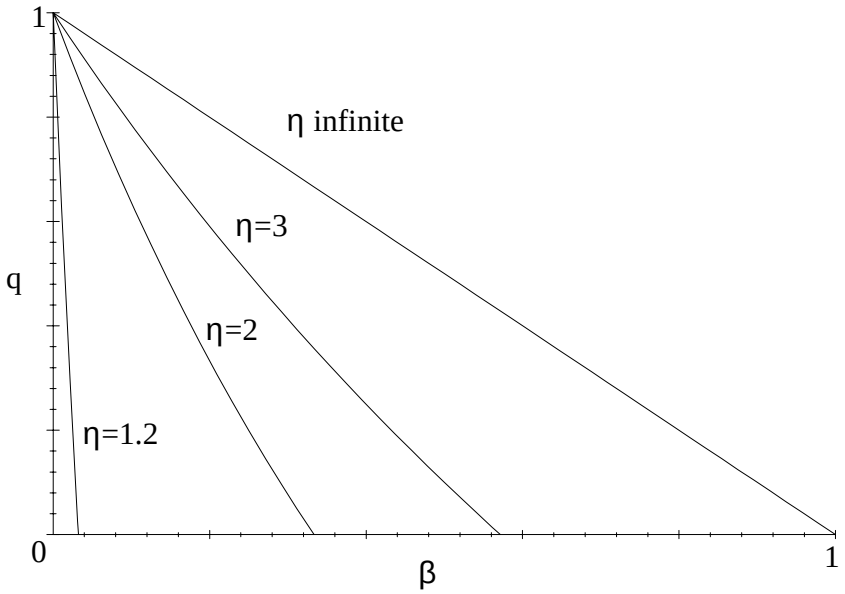

Figure 3. Equilibrium unemployment and credit market imperfections: the role of wage elasticity of labour demand

From (27), and as illustrated by Figures 2 and 3, we can generally conclude that intensified credit market competition tends to increase equilibrium unemployment as long as the labour market imperfections, measured by the relative bargaining power of trade unions (β), are large enough. This lies in line with the result of the previous subsection focusing on trade unions operating with an outside option reflecting only the base wages. With the introduction of profit shares into the outside option of trade unions sufficiently high replacement ratios (q) might cause intensified credit market competition to stimulate employment provided that the labour market imperfections are sufficiently small.

Intuitively, with attention restricted to outside options based on base wages, an increase in the repayment rate induces (base) wage moderation and labour force mobility induces the value of the outside option to decrease so as to outweigh the increased direct cost of financing. As profit sharing induces base wage moderation it is natural that introduction of profit shares into the outside option will reduce the magnitude of the employment-enhancing "outside option" effect. For the combination of a sufficiently high replacement ratio and sufficiently small labour market imperfections this reduction in the "outside option" effect will make the direct funding cost effects dominate.

We can summarize our findings in this subsection according to the following proposition.

Proposition 6 *With a mobile labour force and with profit sharing being part of the relevant outside option, intensified credit market competition will raise equilibrium unemployment when labour market imperfections (measured by* β*) are large enough. But if the labour market imperfections are sufficiently small, intensified credit market competition will reduce equilibrium unemployment in the presence of policies with a sufficiently high benefit-replacement ratio (q). Finally, higher labour demand elasticity will, ceteris paribus, extend the region in which intensified credit market competition reduces equilibrium unemployment.*

VI. Concluding Comments and Policy Implications

This study has focused on the role of labour and credit market imperfections as well as of the interaction between these for the determination of equilibrium unemployment within the framework of the "right-to-manage" approach. In the credit market loan contracts are assumed to be negotiated between financiers and firms, both possessing bargaining power, while the firms and organized labour bargain over the base wage. These two types of negotiations take place sequentially. The labour and credit market negotiations have been assumed to take place conditional on the firm having committed itself to the form of wage contract determining to what extent it makes use of performance-related profit sharing in addition to the negotiated base wage.

The presence of a performance-related wage component in the form of profit sharing has been shown to be a necessary condition for the relationship between the competitiveness of the credit market and equilibrium unemployment. Our analysis has highlighted the critical role of labour mobility for the evaluation of the employment implications of intensified credit market competition. With highly limited labour mobility, increased bargaining power of banks in the credit market will have adverse employment effects, because it increases negotiated base wages in a straightforward way. In fact, our study has confirmed an intuitively appealing conjecture that intensified credit market competition will promote employment under two distinct types of circumstances: (1) a labour force which is perfectly immobile across industries or (2) a labour force which is mobile across industries which all adopt profit sharing as long as labour markets exhibit sufficiently small bargaining power of trade unions and face policies with sufficiently high benefit-replacement ratios.

However, with a labour force mobile across industries the relationship between credit market imperfections and equilibrium unemployment is reversed if employment at a *fixed* wage complements unemployment benefits to constitute the trade union's relevant outside option. Under such circumstances intensified credit market competition will always increase equilibrium unemployment. This relationship is shown to hold also for cases where the outside option incorporates profit sharing schemes as long as the labour market imperfections – measured by the relative bargaining power of the trade unions - are sufficiently strong. We can explain such a relationship between credit market com

petition and equilibrium unemployment in the following way. With sufficiently strong bargaining power of trade unions in the labour markets credit market imperfections will actually serve as a disciplining device whereby the potential of the trade union to exploit this bargaining power is reduced in an efficiency-enhancing way. The introduction of an additional distortion in the form of credit market imperfections improves the performance of the labour market, which suffers from a primary distortion with its roots in the bargaining power of the trade union.[19] As our model has clarified, this happens precisely when the labour market distortion is sufficiently strong.

Our model emphasizes the "first-order" importance of institutional policies directed at reducing the labour market imperfections under those circumstances where profit sharing in other industries is part of the outside option for workers. Namely, in light of our model society will not be able to benefit in terms of employment from intensified credit market competition as long as the primary labour market imperfections are dominant. From (27), and as illustrated in Figures 2 and 3, labour market institutions, where the relative bargaining power of trade unions exceeds 0.33, will under all circumstances prevent higher efficieincy of credit markets to spill over to better employment. Such magnitudes of relative bargaining power of trade unions – measured either in terms of trade union density rates and/or in terms of collective bargaining coverage – do seem to fit observations from European countries (see Nickell and Layard (1999), p. 3041 and DICE database collected by CESifo, http://www.CESifo.de). Thus, links to other markets, such as the credit market, add to the social return from reforms reducing the imperfections in labour markets. This argument seems more relevant the higher is the degree of labour force mobility.

In a world with labour force mobility and where firms widely apply performance-based wage schemes in the form of profit sharing, labour market policies intended to reduce the benefit-replacement ratio can play a role in shifting the economy from a state where the development towards intensified credit market competition harms employment into one where this development promotes employment. Nevertheless, policies to reduce benefit-replacement ratios (q), which are high in European countries (see Nickell and Layard (1999), p. 3045 and DICE database collected by CESifo,

[19] This argument is analogous to the classical second best analysis by Lipsey and Lancaster (1956-57), according to which it is not necessarily desirable from a welfare point of view to decrease distortions in

http://www.CESifo.de), seem to play a more limited role relative to the bargaining power of trade unions (β). Finally, higher labour demand elasticity, which may result from increasing economic integration, will potentially increase the role of policies to reduce benefit-replacement ratios (q) as higher elasticities extend the region in which intensified credit market competition is beneficial for the development of employment.

---

one particular market if several markets simultaneously face distortions.

References

Acemoglu, D. (2001) **Credit Market Imperfections and Persistent Unemployment,** European Economic Review, 45, 665-679.

Anderson, S. – Devereux, M. (1989) **Profit Sharing and Optimal Labour Contracts,** Canadian Journal of Economics, 89, 425-433.

Becsi, Z – Li, V. – Wang, P. (2000) **Financial Matchmakers with Heterogenous Borrowers**, Federal Reserve Bank of Atlanta WP 2000-14, September.

Bester, H, (1995) **A Bargaining Model of Financial Intermediation,** European Economic Review, 39, 211-228.

Bronars, S.G. – Deere, D.R. (1991) **The Threat of Unionization, the Use of Debt and the Preservation of Shareholder Wealth,** Quarterly Journal of **Economics, 56, 231-244.**

Cahuc, P. – Dormont, B. (1997) **Profit Sharing: Does it Increase Productivity and Employment? A Theoretical Model and Empirical Evidence on French Micro Data,** Labour Economics, 4, 293-319.

Dalmazzo, A. (1996) **Debt and Wage Negotiations: A Bankruptcy-Based Approach,** Scandinavian Journal of Economics, 98(3), 351-364.

Dasgupta, S. – Sengupta, K. (1993) **Sunk Investment, Bargaining, and Choice of Capital Structure,** International Economic Review, 34, 203-220.

Funke, M - Maurer, W, - Strulik, H. (1999) **Capital Structure and Labour Demand: Investigations Using German Micro Data,** Oxford Bulletin of Economics and Statistics, 61, 199-215.

Hanka, G. (1998) **Debt and the Terms of Employment,** Journal of Financial Economics , 48, 245-282.

Hart, O. (2000) **Different Approaches to Bankruptcy,** NBER Working Paper No. 7921, September.

Holmlund, B. (1991) **Profit Sharing, Wage Bargaining and Unemployment,** Economic Inquiry, 28, 257-268.

Honkapohja, S. – Koskela, E. (1999) **Finland's Depression: A Tale of Bad Luck and Bad Policies,** Economic Policy, 29, 399-436.

Jerger, J. – Michaelis, J. (1999) **Profit Sharing, Capital Formation and the NAIRU,** Scandinavian Journal of Economics, 101, 257-275.

Koskela, E. – Stenbacka, R. (2000a) **Is There a Tradeoff between Bank Competition and Financial Fragility?,** Journal of Banking & Finance, 24, 1853-1873.

Koskela, E. – Stenbacka, R. (2000b) **The Agency Cost of Debt and Lending Market Competition: A Re-Examination,** Bank of Finland Discussion Papers, 12/2000.

Koskela, E. – Stenbacka, R. (2000c) **Capital Structure, Wage Bargaining and Employment,** Bank of Finland Discussion Papers, 16/2000.

Kruse, D. (1996) **Why Do Firms Adopt Profit-Sharing and Employee Ownership Plans?**, British Journal of Industrial Relations, 34, 515-538.

Layard, R. – Nickell, S. – Jackman, R. (1991) **Unemployment: Macroeconomic Performance and the Labour Market,** Oxford University Press.

Lipsey, R.G. – Lancaster, K. (1956-57) **The General Theory of Second Best,** Review of Economic Studies, 24, 11-32.

Nickell, S. – Layard, R. (1999) **Labour Market Institutions and Economic Peformance,** in Ashenfelter, O. – Card, D. (eds): **Handbook of Labor Economics,** Vol 3, Elsevier Science, 3029-3084.

Nickell, S. – Nicolitsas, D. (1999) **How Does Financial Pressure Affect Firms?,** European Economic Review, 43, 1435-1456.

Perotti, E.C. – Spier, K.E. (1993) **Capital Structure as a Bargaining Tool: The Role of Leverage in Contract Negotiation,** American Economic Review, 83, 1131-1141.

Pohjola, M. (1987) **Profit Sharing, Collective Bargaining and Employment,** Journal of Institutional and Theoretical Economics, 334-342.

Sharpe, S.A. (1994) **Financial Market Imperfections, Firm Leverage, and the Cyclicality of Employment,** American Economic Review, 84, 1060-1074.

Wadhwani, S. – Wall, M. (1990) **The Effects of Profit Sharing on Employment, Wages, Stock Returns and Productivity: Evidence from UK Micro-Data,** Economic Journal, 100, 1-17.

Wasmer, E. – Weil, P. (2000): **The Macroeconomics of Labor and Credit Market Imperfections**, Discussion Paper No. 179, Institute for the Study of Labor (IZA), Bonn.

Weitzman, M. (1985) **The Simple Macroeconomics of Profit Sharing,** American Economic Review, 75, 937-954.

Weitzman, M. (1987) **Steady State Unemployment under Profit Sharing,** Economic Journal, 97, 86-105.