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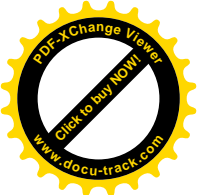
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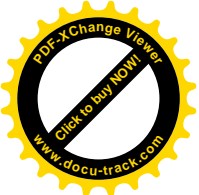


Nicolas Piluso (CERTOP, Université Toulouse III Paul Sabatier)

Gabriel Colletis (LEREPS, Université Toulouse I Capitole)

## Shareholder value and equilibrium rate of unemployment

The aim of this article is to analyse the consequences of the constraint of shareholder value creation on wages and on unemployment rates in equilibrium. We will show that the shareholder value created by a firm directly depends on the payroll. Therefore, both the firm's and the Unions' new maximisation programs are considerably modified. The main result of this analysis is that a switch from profit maximisation to EVA maximisation leads to an increase in unemployment rates. Furthermore, the unemployment rate now depends on new financial variables.



## Introduction

A simplistic understanding of the unemployment question would lead to the conclusion that Anglo-Saxon countries have for a long time shown reduced unemployment because they kept their labour markets flexible and put in place *governance* systems orientated towards transparency and the protection of shareholder interests. This thesis is explained by Zhou, Dekker and Kleinknecht (2011).

This is, in short, the position defended by a number of partisans of a necessary convergence towards the Anglo-Saxon financial and legal organisational model (La Porta, Lopez-de-Silanes, Shleifer, Vishny (2000)).

In this article, we attempt a theoretical critique of this position and propose an alternative explanatory framework in which the maximisation of shareholder value leads to an *increase* in the equilibrium rate of unemployment.

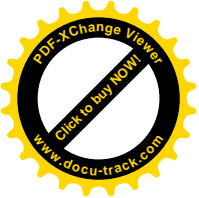
We propose to link the promotion of shareholder value and labour demand. The main object of our article is to identify what is at the heart of the employment contraction that occurs when firms aim to maximise shareholder value. The framework for this analysis is the WS-PS (Wage Setting ó Price Setting) model of Layard, Nickell, Jackman (1991). It is an analytical framework characterised essentially by the imperfection of competition on the labour market, as well as by the existence of a certain real wage rigidity (Pereau and Sanz (2006)). This rigidity is the cause of involuntary unemployment.

We will see that the shareholder is attributed a *guaranteed income ex ante*. Here, we defend the hypothesis that the real significance of shareholder governance is to guarantee the shareholder's income ***whatever the economic or even financial performance of the firm***. The corollary of this guaranteed income is a transfer of risk, in particular onto the firm's employees (see Section 1). Secondly, we will analyse a self-contained aspect of the transfer of risk towards employees: the adjustment in the volume of employment (Section 2). The effects of the shareholder value in wage bargaining are evaluated in Section 3. Then we will see that the introduction of this imperative of shareholder value creation increases the equilibrium rate of unemployment (Section 4).

### 1 The mechanisms and forms of the financierisation of firm strategy

Since the beginning of the 1990s, new instruments to measure the creation of value have been created. The most fashionable is the EVA-MVA (Economic Value Added, Market Value Added) developed by Stern, Stewart and Chew (1995). This method defines value creation as the difference between the firm's net operating profit after taxes and the cost of capital. It implies that the firm must generate a profit equal to the cost of capital to maintain its market value.

The EVA formula traditionally found in marketing manuals is the following:



$$EVA = (\pi - rD) - r_e FP \quad (1)$$

With  $\pi$  the firm's profit,  $r_e FP$  the cost of capital,  $FP$  the value of the capital, and  $rD$  the debt charges

The objective of value creation for the shareholder requires a profit that is superior to the cost of capital. This cost is considered to be a cost of opportunity. It is the income required *ex ante* by the shareholders.

Noted  $r_e$ , it is given to us by the Capital Asset Pricing Model equation (Sharpe, 1964):

$$r_e = r + \beta (E(r_M) - r) \quad (2)$$

with  $\beta$  the firm's non-diversifiable risk,  $E(r_M)$  the expected market rate of return, and  $r$  the asset's risk-free rate of return. The return required by the shareholders is therefore equal to the sum of the asset's risk-free rate of return and a risk premium. The latter is composed of two elements: the market price of aggregated risk (the difference between the expected market rate of return and the risk-free rate of return) and the asset's sensitivity to this risk, measured by  $\beta$ . The latter is by definition equal to:

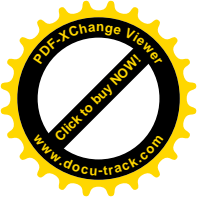
$$\beta = \frac{\text{cov}(r_i, r_M)}{\sigma_{r_M}^2} \quad (3)$$

with  $\text{cov}(r_i, r_M)$  the covariance between the asset's rate of return for firm  $i$  and the market rate of return and  $\sigma_{r_M}^2$  the variance of the market rate of return. When beta equals one, the market rate of return and the rate of return of asset  $i$  vary proportionally. The return required by the shareholders for asset  $i$  is the same as the return required by the market.

Creating value for the shareholder is remunerating the shareholder *over and above* the level of required income defined by the Capital Asset Pricing Model. It involves increasing income while keeping risk constant. It is immediately clear, therefore, that to create value, the firm will attempt not only to modulate its profit but also its cost of capital. A new objective is introduced: decreasing the remuneration required by the shareholder's capital. Because shareholder value is only ever the difference between a firm's profit and the minimum guaranteed income for the shareholder, the decrease in this minimum income implies, all other things being equal, the creation of a supplement in value.

## 2 Financialisation and transformation of the firm's maximisation programme

We have seen in the preceding section that the EVA depends on two main values: the firm's profit, and the minimum guaranteed income for the shareholder. The



latter depends on the firm's beta. However, the transformation of the maximisation programme resides precisely in the dependence of the beta on the payroll.

## 2.1 The hypotheses on a firm's beta

A firm's beta measures, as we have already indicated, the sensitivity of the expected asset returns to the expected market returns. The beta of the firm's assets is determined by two important factors which have been identified by Lev (1974), Mandelker and Rhee (1984): *financial risk*, that increases with the level of debt, and *operating risk*, measured by the operating elasticity and determined by the ratio between the variance of the operating result and the variance of the turnover.

Any fixed cost contributes to an increase in the sensitivity of the profit to the variations in the turnover. It is thus possible to show that the operating risk depends on the quantity of labour employed. Indeed, in many cases, jobs in firms that are listed on the stock exchange are long-term contracts and represent a fixed cost for the firm in the short term; the existence of cycles of productivity shows that the adjustment of the volume of employment according to circumstances engenders relatively extensive costs and delays.

Let us return to the formula for the beta of a firm  $i$ . It can be formulated, as we saw above, in the following way:

$$\beta_i = \frac{\text{cov}(r_i, r_M)}{\sigma^2_{r_M}}$$

$r_i$  is the operating return rate for the firm  $i$  in question. Let us postulate the existence of an anonymous firm that uses the labour factor  $L$  to produce and that disposes of capital  $F$ . The return on equity can be formulated thus:

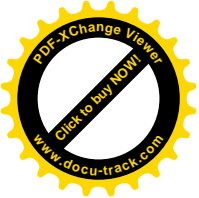
$$r_i = \frac{p_i Y_i - w L_i}{F}$$

With  $Y_i$  the quantity of products sold and  $w$  the real wage rate. Let's suppose that  $Y_i$  is a mono-factorial Cobb-Douglas production function whose argument is the quantity of labour used. The operating rate of return can be reformulated in the following way:

$$r_i = \frac{A L_i^\alpha - w L_i}{F}$$

With  $A$  the productivity of the labour and  $\alpha$ , the production elasticity. Let's replace  $r_i$  by its expression in the beta formula.

$$\beta = \frac{\text{cov}\left(\frac{A L_i^\alpha - w}{F}, r_M\right)}{\sigma^2_{r_M}}$$



Let's suppose for the purpose of this demonstration that only productivity is a random variable. Given the properties of covariance, this means:

$$\beta = \frac{L_i^\alpha}{F} \frac{\text{cov}(A, r_M)}{\sigma_{r_M}^2} \quad (4)$$

It is thus possible, according to us, to demonstrate the dependence of beta on  $L_i$ , the quantity of labour used. *When one formulates a firm's operating result by using the formula for profit traditionally used in microeconomics, it is possible to demonstrate that the beta of a firm is an increasing function of the quantity of labour used.*

Payroll has two kinds of effects. For a given revenue, a decrease in payroll leads to an **increase** in the firm's profit because it leads to a decrease in employment costs. Furthermore, a decrease in payroll leads to a **decrease** in the beta of the firm (proposition 1) and therefore in the shareholder's required income. Given that shareholder value is the difference between the firm's profits and its cost of capital, a decrease in payroll leads to two **increases** in shareholder value: once via an increase in the firm's profits and once a the decrease in the firm's cost of capital.

## 2.2 Shareholder value maximisation program

It is now possible to **rewrite** the firm's maximisation program, integrating a minimum guaranteed income for the shareholder.

The prices are given for the average representative firm. It maximises its profit (minus the cost of capital) according to the quantity of labour employed.

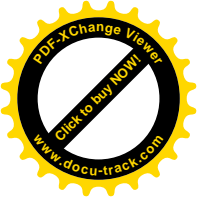
We formulate the firm's shareholder value maximisation programme in the following way:

$$\begin{aligned} \text{Max } \pi &= AL^\alpha - wL - \theta F(r + \beta\phi) \\ &L \\ \text{with } \beta &= \frac{L^\alpha}{F} \frac{\text{cov}(A, r_M)}{\sigma_{r_M}^2} \text{ et } \phi = (E(r_M) - r) \end{aligned}$$

$A$  is the global productivity parameter of the factors,  $L$  the quantity of labour employed,  $w$  the real wage rate,  $\theta$  a parameter measuring the pressure emanating from the control market (on which depends the development of employee shareholding),  $F$  the amount of capital,  $r$  the risk-free interest rate, and  $\phi$  the stock market risk premium equivalent to  $(E(r_M) - r)$  (equation 1).  $AL^\alpha - wL$  represents the firm's profit;  $(r + \beta\phi)$  represents the unitary cost of capital, the sum of the risk-free interest rate  $r$  and the total risk premium.

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<sup>1</sup> The covariance property that we use for the calculation is the following. If X and Y are two random variables and a, a parameter, then  $\text{cov}(aX, Y) = a \text{cov}(X, Y)$ .



The new maximisation programme that we have just formulated is an EVA maximisation programme. We have further integrated a function representing the constraint emanating from the control market. The firm has in mind a *benchmark* which is the return on equity required by the shareholders. This is endogenous in relation to the quantity of labour employed.

The result of the programme is:

$$L = \left( \frac{\alpha(A-G)}{w} \right)^{\frac{1}{1-\alpha}} \tag{5}$$

$$\text{with } G = \theta\alpha \frac{\text{cov}(A, r_M)}{\sigma^2_{r_M}} \phi$$

Although a profit maximising firm has a labour demand function which depends on real wages and different technological constraint parameters (productivity, production elasticity of the labour factor), the EVA maximisation results in a transformation of this demand function. *When the firm maximises shareholder value, the labour demand function varies negatively with real wage rate but also:*

- with the degree of activity of the control market  $\theta$ ,
- with the degree of dependence of beta on payroll  $\frac{\text{cov}(A, r_M)}{\sigma^2_{r_M}}$  ;
- with the unitary risk premium  $\phi$ , the difference between the observed stock market return and the risk-free interest rate (assumed to be nil for simplification purposes)

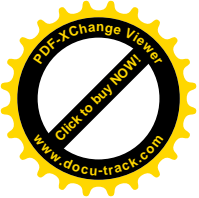
This question now is: what influence do these new parameters have, on the macroeconomic scale, on the equilibrium unemployment rate? The answer to this is developed in the following sections. For this, we need to look at the effects of shareholder constraints on wage bargaining (formalised by Layard, Nickell and Jackman (1991)).

### 3 The wage bargaining process

Let's suppose that a Union is composed of N members that offer their labour. The Union takes care both of employment and of wages; its general objective is for a maximum of workers to profit from the largest real wage rate possible. We formulate the utility function of the Union in the following way:

$$V_s = (L)^\lambda (w - w_r)$$

With  $\lambda$  the weight of employment in the Union's objective (we hypothesise  $\lambda < 1$ ),  $w$  the bargained wage of the worker, and  $w_r$ , the real wage offered by the competition.



The modelling of bargaining requires non-cooperative game theory. The maximisation of the generalised Nash criterion is the standard model for the negotiation process (Roth (1979)). It corresponds to the product of the gains each party can obtain in the case of an agreement, weighted by the importance of the agents in the negotiation. The point of agreement between the Union and the firm is the solution to the following equation:

$$\text{Max}_w (V_s - \bar{V}_s)^\gamma (EVA - \bar{EVA})^{1-\gamma}$$

With  $0 < \gamma < 1$  the bargaining power of the Unions and  $\bar{V}_s$  the reservation wage. The product  $(V_s - \bar{V}_s)^\gamma (EVA - \bar{EVA})^{1-\gamma}$  is what the Union is trying to maximise, and  $(EVA - \bar{EVA})^{1-\gamma}$  is what the firm is trying to maximise. We are in a  $\phi$ Right-to-Manage $\phi$  case (Nickell et Andrews, 1983): the wage is the product of the negotiation, whereas the firm fixes the level of employment. We note  $\bar{V}_s = w_r$ . We consider furthermore that  $\bar{EVA} = 0$ . Therefore:

$$\text{Max}_w L^{\gamma \cdot \chi} (w - w_r)^\gamma (EVA)^{1-\gamma}$$

with :  $L = \left(\frac{\alpha(A-G)}{w}\right)^{\frac{1}{1-\alpha}}$  and  $EVA = \frac{\alpha(A-G)}{w} (A - \alpha(A-G) - \theta G) - \theta rF$ .

Let $\phi$  resolve the programme (see Appendix). The first order condition is :

$$\frac{w - w_r}{w} = \mu = \frac{\gamma(1-\alpha)}{\gamma \cdot \chi + (1-\gamma)\alpha}$$

constitutes the Union margin rate and determines the Union revenue that workers can obtain when they are in employment. It is higher if the Union has strong bargaining powers and if the weight of employment in the Union objectives is low. Therefore:

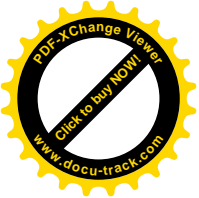
$$w = \frac{w_r}{1 - \mu} \tag{6}$$

The standard result obtained in Nickell and Andrews (1983) is identical. This is not surprising given that in their work already, the value of the bargained wage depended only on the reservation wage and on the elasticity values.

#### 4 Shareholder value creation, equilibrium unemployment rates and wages.

All the elements are now present to allow us to construct a revised WS-PS model. In the standard, WS-PS model, the companies are in a situation of imperfect competition on the goods market, and fix their prices. Here, we hypothesise perfect competition, because the imperfection hypothesis adds nothing to the





model. At most, it leads to increasing unemployment rates but does not modify the nature of our conclusions.

Let's suppose that the reservation wages of workers are equal to:

$$w_r = (1-u)w + uB \quad (7)$$

With  $u$ , the unemployment rate,  $B$  the unemployment benefits and  $w$ , the average wage rate in the economy. By looking for another job in the economy, the average worker will find employment with probability  $(1-u)$ , and will be unemployed with probability  $u$ . In equilibrium, negotiations in each employment area will lead to the same real wage rate, so much so that, following on from equations (6) and (7), we can formulate:

$$(WS) \quad w = \frac{u}{u-\mu} B \quad (8)$$

What are the consequences of this for the equilibrium rate of unemployment?

Whereas in our model, with shareholder constraints and EVA incentives for employees, unemployment is determined by the following expression:

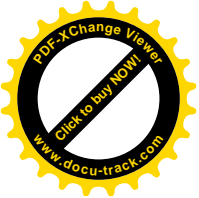
$$(PS) \quad u = 1 - \frac{\left\{ \frac{\alpha(A-G)}{w} \right\}^{\frac{1}{1-\alpha}}}{N} \quad (9)$$

The introduction of shareholder constraints in the firm's maximisation programme contributes to increasing the pressure on labour demand: to the same wage rate corresponds a weaker labour demand compared to a traditional labour demand function.

Equilibrium unemployment rates therefore increase: the PS graph moves towards the right in the plane  $(u, w)$ , but the WS graph stays the same. The movement of the PS graph is the reflection of the shareholder constraints decreasing labour demand for a given wage rate. This decrease in labour demand not only decreases wage costs, but also decreases the firm's beta. In the end, the equilibrium wage rate obtained by the Unions decreases because the labour demand is weaker.

## Conclusion

The role of financial markets in the development and/ or persistence of unemployment is a little explored lead in the literature. In this regard, the analysis of the transformations impelled by globalisation seemed particularly interesting to us. The introduction of an ex ante income requirement on the part of shareholders in the WS-PS model enabled us to draw several conclusions. On the one hand, we saw that it leads to an increase in equilibrium unemployment rates. On the other hand, this required income enabled us to demonstrate that new variables as the stock market risk premium are likely to influence equilibrium unemployment.



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## Appendix

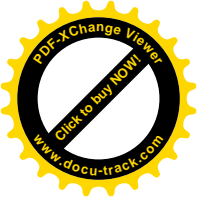
By replacing  $w$  by its expression in (6), it is possible to rewrite the maximisation programme:

$$aL^\alpha - LL^{\alpha-1}(\alpha(A-G)) - \theta GL^\alpha - \theta rF$$

From which we can draw the following value creation function by factoring in  $L$  :

$$EVA = \frac{\alpha(A-G)}{w} L^{\frac{\alpha}{1-\alpha}} (\alpha(A-G) - \theta G) - \theta rF$$

This is the value creation function for the firm.



It is thus possible to reformulate the maximisation programme in the following way :

$$\text{Max. } \gamma \cdot \chi \log L + \gamma \log(w - w_r) + (1 - \gamma) \log EVA$$

$$w \geq 0$$

Then, by replacing L by its expression :

$$\text{Max. } \gamma \log(w - w_r) - \frac{\gamma \chi + (1 - \gamma) \alpha}{1 - \alpha} \log w_i + \log C$$

$$w \geq 0$$

$$\text{with } C = \alpha(A - G)^{\frac{\gamma \chi + (1 - \gamma) \alpha}{1 - \alpha}} [\alpha(A - G)^{\frac{\alpha}{1 - \alpha}} (A - \alpha(A - G)^{\frac{\alpha}{1 - \alpha}})^{1 - \gamma}]$$