

Volume 32, Issue 4**Shareholder value and equilibrium rate of unemployment**

Nicolas Piluso Pr
CERTOP Université Paul Sabatier Toulouse 3

Gabriel Colletis Pr
LEREPS Université Capitole Toulouse 1

Abstract

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.

1. Introduction

Anglo-Saxon countries have for a long time kept their labour markets flexible and put in place governance systems orientated towards transparency and the protection of shareholder interests. In this respect, the question of whether shareholder governance maximises collective welfare is debated in the literature. La Porta, Lopez-de-Silanes, Shleifer, and Vishny (2000) argue that a convergence towards the anglosaxon legal and financial organisational model is inevitable. However, other economists have recently questioned this hypothesis. Allen, Carletti and Marquez (2009) analyse, in a context of imperfect competition, conditions under which the stakeholder model can be preferable both from the point of view of the firm and from the point of view of its employees. Magill, Quinzii and Rochet (2011) further demonstrate that in a context of uncertainty, the stakeholder model is Pareto optimal.

In this paper, our aim is not to compare the shareholder model with the stakeholder model with regards to collective social welfare. We aim to identify a possible cause for the unemployment rate in equilibrium when a firm deploys a strategy that aims to maximise shareholder value.

More precisely, 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 – Price Setting) model of Layard, Nickell and 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).

2. 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:

$$EVA = \pi - \theta \times WACC \times F \quad (1)$$

with π the firm's profit, F the value of the capital, and $WACC$ the weighted average cost of capital. θ is a measure of the pressure emanating from the control market. It represents, in other words, the weight of the value creation constraint for the shareholder¹.

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. *If $\theta=0$, capital is considered to be sunk: capital have no alternative opportunity to create value. As a consequence, it does not require any compensation. If $\theta=1$, capital needs to be raised, and thus compensation is required according to the available alternative opportunity.*

The weighted average cost of capital is equal to:

$$WACC = (r_F + \beta\phi)(1 - td)$$

where r_F is the riskless rate of return, β is the asset beta, ϕ is the equity risk premium, t the corporate tax rate and d is the appropriate leverage.

We will assume from here on that the debt stock is nil as it plays no part in the demonstration, therefore²:

$$WACC' = r + \beta\phi \quad (2)$$

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 β . The latter is by definition equal to:

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

¹ Pagano and Volpin (2005) show that the weight of shareholder value can vary according to the behaviours of the firm's managers and its employees, who may ally themselves against the shareholders in order to reduce the weight of the threat of a hostile takeover.

² $WACC'$ is given to us by the Capital Asset Pricing Model equation (Sharpe, 1964). In the following section, we are using the MM assumptions that the risk of the tax shields is equal to the cost of debt (Cooper and Nyborg, 2006).

with $\text{cov}(r, r_M)$ the covariance between the asset's rate of return for firm 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 vary proportionally.

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.*

3. Financialisation and transformation of the firm's maximisation program

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.

3.1 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 (Lev (1974), Mandelker and Rhee (1984)).

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 term³.

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

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

r is the operating return rate for the firm. 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:

³ The existence of cycles of productivity shows that the adjustment of the volume of employment according to circumstances engenders relatively extensive costs and delays.

$$r = \frac{Y - wL}{F}$$

with Y the quantity of products sold and w the real wage rate. Let's suppose that Y 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:

$$r = \frac{AL^\alpha - wL}{F}$$

With A the productivity of the labour and α , the production elasticity. Let's replace r by its expression in the beta formula.

$$\beta = \frac{\text{cov}\left(\frac{AL^\alpha - wL}{F}, r_M\right)}{\sigma_{r_M}^2}$$

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

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

It is possible to demonstrate that the beta of a firm is an increasing function of the quantity of labour used. Therefore, any reduction in employment leads to value creation for the shareholder because it reduces not only production costs but also the firm's beta.

3.2 Shareholder value maximisation program

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

The prices are given for the average representative firm. We assume that the only really risk-free asset is money, and that its rate of return is nil ($r_F=0$). This hypothesis allows us to slightly simplify the calculations and does not significantly modify the results.

The firm maximises its profit (minus the cost of capital) according to the quantity of labour employed:

$$\begin{aligned} \text{Max EVA} &= AL^\alpha - wL - \theta F(\beta\phi) \\ L &\geq 0 \end{aligned} \quad (5)$$

$$\text{with } \beta = \frac{L^\alpha}{F} \frac{\text{cov}(A, r_M)}{\sigma_{r_M}^2}$$

The result of the program is:

$$L = \left(\frac{\alpha(A-G)}{w} \right)^{\frac{1}{1-\alpha}} \quad (6)$$

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

When the firm maximises shareholder value, the labour demand function varies negatively with real wage rate w but also:

- with the degree of activity of the “control market” θ ,
- with the degree of dependence of beta on payroll $\frac{\text{cov}(A, r_M)}{\sigma_{r_M}^2}$,
- with the unitary risk premium ϕ .

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)).

4. 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:

$$V_s = (L)^\chi (w - w_r) + w_r$$

With χ the weight of employment in the Union's objective (we hypothesise $\chi < 1$), 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:

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

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

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

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

Let's resolve the programme (see Appendix). The first order condition is:

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

μ 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 γ and if the weight of employment in the Union objectives χ is low. Therefore:

$$w = \frac{w_r}{1-\mu} \quad (7)$$

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.

5. 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:

$$w_r = (1-u)w + uB \quad (8)$$

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 (7) and (8), we can formulate:

$$(WS) \ w = \frac{u}{u-\mu} B \quad (9)$$

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:

$$(PS) \quad u = 1 - \frac{\left\{ \frac{\alpha(A-G)}{w} \right\}^{\frac{1}{1-\alpha}}}{N} \quad (10)$$

The introduction of shareholder constraints in the firm's maximisation program 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 weaker⁴.

6. Conclusion

The analysis of the transformations impelled by globalisation seemed particularly interesting to us. We therefore introduced an ex ante income requirement on the part of shareholders in the WS-PS model. This enables 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 enables us to demonstrate that new variables such as the stock market risk premium are likely to influence equilibrium unemployment.

7. Appendix

It is possible to rewrite the maximisation program (5):

$$EVA = AL^\alpha - wL - GL^\alpha$$

Using (6), we get :

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

This is the value creation function for the firm.

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

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

$$w \geq 0$$

⁴ The increase in the unemployment rate in equilibrium does not necessarily lead to a decrease in collective welfare because the increase in the unemployment rate in equilibrium enables value creation for the shareholder

Then, by replacing L by its expression, we get:

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

$$w \geq 0$$

$$K = (1-\gamma) \log(1-\alpha) + \left[(1-\gamma) + \frac{\gamma\chi + (1-\gamma)\alpha}{1-\alpha} \right] \log(A-G)$$

with

Bibliography

Allen, F., Carletti, E. and Marquez, R. (2009) « Stakeholder Capitalism, Corporate Governance and Firm Value », unpublished working paper.

Cooper, Ian A. and Nyborg, Kjell G. (2006) « The value of tax shields IS equal to the present value of tax shields », *Journal of Financial Economics* **81**, 215-225.

La Porta, R., Lopez-De-Silanes, F., Shleifer A. and Vishny, R. W. (2000) « Investor protection and corporate governance », *Journal of Financial Economics* **58**, 3-27.

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

Lev, B. (1974) « On the association between operating Leverage and Risk », *Journal of Financial and Quantitative Analysis*.

Magill, M., Quinzii, M. and Rochet, J.C. (2011) « A Theoretical Foundation of the Stakeholder Corporation », unpublished manuscript.

Mandelker, G. F. and Rhee, S. G. (1984) « The impact of the degrees of operating and financial leverage on systematic risk of common stock », *Journal of Financial and Quantitative Analysis* **19**, 45-57.

Nickell, S.J. and Andrews, M. (1983) « Unions, real wages and employment in Britain 1951-79 », *Oxford Economic Papers* **35**, 183-206.

Pagano, M. and Volpin, P. (2005) « Managers, workers, and corporate control », *Journal of Finance* **60**, 841- 868.

Pereau, J-C and Sanz, N. (2006) « Trade unions, efficiency wages and employment », *Economics Bulletin* **10**, n° 4, 1-8.

Roth, A. (1979), *Axiomatic models of bargaining*, Berlin, Springer Verlag.

Sharpe, W. (1964) « Capital Asset Prices: a Theory of Market Equilibrium Under conditions of Risk », *Journal Of Finance* **19**, 425-442.

Stern, J.M., Stewart, G.B. and Chew, D.H (1995) « The EVA financial management system », *Journal of Applied Corporate Finance*, 32-46.

Zhou, H., Dekker, R. and Kleinknecht A. (2011) « Flexible labor and innovation performance: evidence from longitudinal firm level data », *Review of Industrial and Corporate Change* **20** (3), 941-968.