# Toward a common good model of the firm
# with suppliers, labor and consumers

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**Abstract:** Recurrent business scandals culminating in the recent subprime mortgage crisis have caused substantial harms to various corporate stakeholders and entire economies. As a result of this alarming phenomenon, business schools have joined the United Nations Principles for Responsible Management Education (PRME) movement and have committed to develop teaching tools and to research on frameworks that can help orient business students towards becoming more socially responsible. The tendency of self-interested models of economics, such as the standard textbook profit maximizing model of the firm, in promoting imprudent self-interested behavior among business students has been revealed by research and lamented by business management scholars. Standard theory suggests that firms that maximize profit simply take an action when the marginal revenue of that action is equal to the marginal cost of that action, and whether those actions are beneficial or not to its stakeholders is not made explicit in basic expositions of the model found in textbooks. It becomes important, therefore, to develop models of the firm which are more socially oriented. The paper refines previous work on a baseline formal model of the firm which incorporates the provision of living wages and benefits for the employees of the firm and those of its suppliers, while pursuing maximum profit. The baseline model is extended to include customers who have information on and may value the firm's labor practices.

**Key Words:** model of the firm; living wage; common good; profit maximization

## 1. BACKGROUND AND MOTIVATION

In 2008, De La Salle University signed up for the United Nations Principles for Responsible Management Education (PRiME) – a network of hundreds of business schools committed to teaching business students about socially responsible and sustainability-oriented business practice (The Principles for Responsible Management Education, 2013). PRiME was a response to the string of high-profile business scandals in the last two decades, including Enron (Cruver, 2003), which tend to involve graduates from the top business schools. The movement calls for a more proactive role for business schools in properly forming tomorrow's business

leaders.

Among the principles PRiME signatories commit to are:

Principle 3 – Method: We will create educational frameworks, materials, processes and environments that enable effective learning experiences for responsible leadership.

Principle 4 -- Research: We will engage in conceptual and empirical research that advances our understanding about the role, dynamics, and impact of corporations in the creation of sustainable social, environmental and economic value.

Pursuant to these principles, there is a need to formulate more socially-oriented economic models of the firm, especially for those teaching business students who, after all, are expected to be future business leaders. Management scholars have pointed out the need for better and more humanistic management models (Ghoshal, 2005; Teehankee, 2008) These has been made more critical given research which has shown the tendency of self-interest based economic models to encourage less socially-oriented, and in some cases greedy, decisions among students (Frank, Gilovich and Regan, 1993; Wang, Malhotra, & Murnighan, 2011). Some economics students have openly advocated the reform of economics curriculum to include representations of the economic world beyond what is captured in traditional economics models. Such a reform movement started by French economics students and faculty members – dubbed the post-autistic economics movement because of the unrealism of standard models-- asked professors to initiate reforms to "rescue economics from its autistic and socially irresponsible state" (Fullbrook, 2003; p. 1). A similar action has been launched by British students a decade later (Ward-Perkins & Earle, 2013).

The recent subprime mortgage crisis showed that even regulators can be led seriously astray by economic models. In 2002, former US Federal Reserve Chairman Alan Greenspan spoke of financial derivatives (highly complex financial instruments which derived their value from highly mathematical financial economics models) claimed that:

These increasingly complex financial instruments have been especial contributors,

particularly over the past couple of stressful years, to the development of a far more flexible, efficient, and resilient financial system than existed just a quarter-century ago. (Chittum, 2013)

Greenspan resisted the regulation of these financial instruments based on his belief that market forces were adequate to correct any potential abuse. Derivatives played a major role in the subsequent global financial crisis, leading Greenspan to admit his error during a Congressional hearing in 2008: "This modern risk-management paradigm held sway for decades [but] the whole intellectual edifice, however, collapsed in the summer of last year" (Andrews, 2008). Financial Times editor Gillian Tett explained Greenspan's realization:

… the crisis had exposed a 'flaw' in his world view. He had always assumed that bankers would act in ways that would protect shareholders – in accordance with free-market capitalist theory – but this presumption turned out to be wrong. (Tett, 2013)

Given this backdrop, Sauler and Teehankee (2013) sought to begin the process of formulating an alternative economic model of the firm which can be taught in introductory economics courses. This incorporated social orientation beginning with the provision of living wages and developmental benefits for employees.

The socially-oriented model presented in this paper is based on the common good principle. The choice of this principle as a basis for economic modeling is partly due to the University's Vision-Mission which calls for the integration of faith and scholarship. The Compendium of the Social Doctrine of the Church (Compendium of the social doctrine of the Church, 2004) explains the common good as follows:

… the common good indicates "the sum total of social conditions which allow people, either as groups or as individuals, to reach their fulfilment more fully and more easily". The common good does not consist in the simple sum of the particular goods of each subject of a social entity. Belonging to everyone and to each person, it is and remains "common",

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because it is indivisible and because only together is it possible to attain it, increase it and safeguard its effectiveness, with regard also to the future.

The common good is also well-known among some secular scholars and economists. Lutz (1999) explained the principle of the common good in these terms:

> …the common good is the same as the common interest of members of society, and this common interest goes beyond the traditionally narrow economic domain to include interest in the quality of social relations. [It argues for] how to organize the social economy so as to allow its members to realize common interest in the provision of certain basic goods to all members of the community. (pp. 2-3)

This paper aims to build on the baseline model of Sauler and Teehankee (2013) by refining the formal representation and adding customers as agents interacting with the firm and who may care about the socially-oriented labor practices of the firm.

## 2. METHODOLOGY

The paper utilizes the formal modelling approach of mathematical economics.

## 3. THE MODEL

Consider a firm with a profit function

$$\Pi_F := pF\left(S, L_F, \gamma(v)\right) - \left[p_S S + w_F L_F + \delta(v)\right] \quad (\text{Eq. 1})$$

where:

| | |
|---|---|
| $p$ | = market price of firm output |
| $F$ | = production function of firm |
| $S$ | = suppliers |
| $L_F$ | = laborers employed by the firm |
| $p_S$ | = market price of supplier output |
| $w_F$ | = wage rate of the firm: "compliant effort" |

| | |
|---|---|
| $\delta(v)$ | = cost of provision of benefit by the firm |
| $\gamma(v)$ | = effort function: "committed effort" |

Consider the suppliers with a representative profit function given by

$$\Pi_S := p_S G\left(L_S, \gamma(v)\right) - \left[w_S L_S + \delta(v)\right] \quad (\text{Eq. 2})$$

where:

| | |
|---|---|
| $G$ | = production function of the suppliers |
| $L_S$ | = laborers employed by the firm |
| $w_S$ | = wage rate of the firm: "compliant effort" |

The other variables in the profit function of the suppliers are defined similarly as in the variables that appear in the profit function of the firm.

Define $\omega$ as the "living wage", i.e., "a wage [rate] more than the minimum wage [rate] and allows an employee to support a family and even have discretionary income". We assume that a worker receives opportunities if their wage $w_F$ or $w_S$ is at least the same value as the living wage, which we denote as $\omega$, as well as additional benefits, $v$, from their employer, as in Ali and Son (2007). Hence, we have

$$y_i = \begin{cases} 100, & w_S, w_F \geq \omega \\ 0, & w_S, w_F < \omega \end{cases} \quad (\text{Eq. 3})$$

We adopt the view that the living wage is distinct from the minimum wage and allows an individual access to opportunities that minimum wages may not.

Consumers are described by the following utility function

$$U = U(\beta x, y) \quad (\text{Eq. 4})$$

where:

| | |
|---|---|
| $U$ | = utility function of the representative consumer |
| $x$ | = output of the firm |

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*y*        = composite output of other firms
*β*        = information parameter representing the
consumer's knowledge about the firm's good labor practices,
i.e., providing for living wages and benefits

## 4. RESULTS

From the profit functions of the firm and the suppliers, applying the necessary condition for a maximum, it confirms the results of standard microeconomic theory: that the value of the marginal product of inputs equals the market price of that input used for production. Moreover, by the implicit function theorem, we have

$$\frac{F_{L_F}{'}\left(S, L_F, \gamma(v)\right)}{F_S{'}\left(S, L_F, \gamma(v)\right)} = -\frac{dS}{dL_F} = G_{L_S}{'}\left(L_S, \gamma(v)\right) \quad \text{(Eq. 5)}$$

which is precisely the slope of the production function F, holding committed effort γ(v) constant (say, at the optimal benefit level v*), called the marginal rate of technical substitution of S relative to LF. Equation (5) also implies that as the marginal productivity of labor to the supplier increases, the firm is more willing to substitute suppliers output for labor as inputs.

Also we have

$$\frac{F_{\gamma}'\left(S, L_F, \gamma(v)\right)}{F_S{'}\left(S, L_F, \gamma(v)\right)} = -\frac{dS}{d\gamma} = G_{\gamma}'\left(L_S, \gamma(v)\right) \quad \text{(Eq. 6)}$$

which is the marginal rate of technical substitution of γ relative to S, now holding LF constant, i.e., the relative change of the inputs γ relative to S in the production function F of the firm. Equation (6) follows a similar argument as in equation (5).

Optimizing the utility function of the consumer with respect to his or her budget constraint, we obtain

$$\frac{\beta U_x'(\beta x, y)}{U_y'(\beta x, y)} = -\frac{p_x}{p_y} \quad \text{(Eq. 7)}$$

where:

$p_x$        = price of the "common good" output of the firm

$p$y        = price of the composite good

which implies higher consumption for the "common good" x relative to other goods y, if consumers know more of the firm's good practices.

Model Summary

In this model, there are four economic agents: the firm, the suppliers, labor and consumers. Laborers can either work for the firm or any of the suppliers and receive wages as well as additional benefits. Workers may opt not to work if they are not receiving the living wage. When workers receive the living wage, we define them as being able to afford opportunities in society. When workers do work, they provide the firm or the supplier with some level of compliant effort, which is the minimum effort required to accomplish their tasks and can be viewed as the basic unit of labor as viewed in the basic theory of the firm. Workers in this model also provide committed effort which is dependent on the benefits they receive from their employers. This is to include the possibility of employers giving more to their employees than the living wage and receiving more from their employees in return. The firm's choice is then to decide on the workers to hire, the benefits to give them, and the suppliers to work with. The suppliers' choice is to decide on the workers to hire and the benefits to give them. When the firm and the supplier both seek to maximize profit, we find that the marginal products of their inputs are related to one another. This provides some insight into how the actions of the three components of firm, supplier and labor, if seeking to maximize profit (for the firm and the supplier) or if seeking to afford opportunities (in the case of labor), under the conditions set in the simple model, affect the others' outcomes. The model represents socially-conscious

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