Towards a Common Good Model of the Firm

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Business schools that have joined the Principles for Responsible Management Education (PRME) are 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 self-interested behavior among students has been revealed by research. It becomes important, therefore, to develop models of the firm which are more socially oriented. The paper presents a baseline model of the firm which incorporates the provision of living wages and benefits for the employees of the firm and those of its supplier, while pursuing maximum profit.

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BACKGROUND AND MOTIVATION

In light of major business scandals involving business school graduates since the turn of the century, more than 400 business schools from around the world have joined a movement called The Principles for Responsible Management Education (PRME) initiated by the United Nations to reform the teaching of business towards emphasizing social responsibility and sustainability (Principles for Responsible Management Education, n.d.). De La Salle University (DLSU), to which we belong, joined PRME in 2008 and has since advocated for other Philippine business schools to also sign-up to PRME.

A key commitment to PRME is expressed in Principle 3, that is, “Method: We will create educational frameworks, materials, processes and environments that enable effective learning experiences for responsible leadership” (Principles for Responsible Management Education, 2013, para. 4). In addition, signatories commit to Principle 4, that is, “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” (para. 5). These principles emphasize that the teaching of responsible management practice cannot be effectively pursued without the appropriate teaching tools and the supporting

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research. In particular, such tools and research will need to depart from those used in the past if business students are to be reoriented to increased social expectations for responsible behavior. A PRME Working Group made the following recommendation:

> New research should focus on key questions: What is the purpose, in both business and societal terms, of a company or business investment? What are the legitimate rights and responsibilities of multiple stakeholders and how are they to be considered? What are the impacts of a firm's strategy on its business outcomes and on the quality of life in the community? How should performance be assessed? (Research and the Principles for Responsible Management Education – Working group report: Development of principle #4, n.d., p. 9)

With respect to the economic role of the firm, the main teaching in the majority of business schools is the profit maximizing model of the firm. This long-standing tradition in economics education was, perhaps, stated most forcefully in 1962 when the renowned economist and Nobel Laureate Milton Friedman (2002) wrote in *Capitalism and Freedom*:

> The view has been gaining widespread acceptance that corporate officials … have a social responsibility that goes beyond serving the interests of their stockholders…. This view shows a fundamental misconception of the character and nature of a free economy. In such an economy, there is one and only one social responsibility of business – to use its resources and engage in activities designed to increase its profits so long as it stays within the rules of the game, which is to say, engages in open and free competition, without deception or fraud…. (p. 133)

Friedman's has been one of the most durable views of the role of corporations despite its acknowledged limitations and dangers. Fortune Magazine called "the cult of the shareholder" as the "single biggest reason" behind such business scandals as Enron (Cruver, 2003) and Arthur Andersen at the turn of the century (DesJardins, 2003).

Since joining PRME, DLSU has intensified the orientation of its business students towards more socially responsible and inclusive behavior through the adoption of a new introductory management textbook which introduces the multistream approach to managing the firm as an alternative to the mainstream approach to management. These management approaches have different purposes as indicated by the criteria for effectiveness applied (Dyck & Neubert, 2010):

> For *Mainstream* management, effectiveness comes from maximizing materialist-individualist outcomes (e.g., productivity, competitiveness, profitability).
>
> For *Multistream* management, effectiveness comes from finding a balance among multiple forms of well-being (e.g., material, individual, social, ecological, intellectual, physical, and spiritual) for multiple stakeholders (e.g., owners, members, customers, suppliers, competitors, and neighbors). (p. 25)

In addition to the introductory management course, the other course which initiates business students to the nature and purpose of firm is the course on introductory economics. This course will need to be addressed if the re-orientation of business students is to be effectively achieved (Teehankee, 2008b).

Significantly, the 2008 mortgage crisis has prompted even economics students to question their training. The Post-Crash Economics Society declared itself a group of economics students from the University of Manchester who are advocating for a major revision of the economics syllabus (Ward-Perkins & Earle, 2013).

In light of the foregoing discussion, the objectives of this paper are to:

1. Review the main features of the profit maximizing model of the firm taught to

business students in the basic economics course and the implications of this model in the attitudes of students towards behaviors related to social responsibility, such as cooperativeness and greed.
2. Present the common good as an alternative principle for grounding a model of the firm which can be taught to business students.
3. Present an initial formal model of the firm based on a common good normative argument.

FIRM BEHAVIOR AS DEPICTED IN INTRODUCTORY ECONOMICS TEXT: RHETORIC AND PEDAGOGICAL IMPLICATIONS

In order to situate the intent of this paper, an examination of the critical features of the basic model of the firm introduced to students in a first course in economics needs to be made, especially in terms of (1) the purpose of the firm and (2) the role of employees in the firm. As a case in point, the textbook *Principles of Economics* by Case, Fair, and Oster (2012), introduced the concept of the firm as a production entity serving the needs of others but qualifies this in terms of the profit motive:

> A firm exists when a person or a group of people decides to produce a good or service to meet a perceived demand. Firms engage in production – that is, they transform inputs into outputs—because they can sell their products for more than it costs to produce them. (p. 180)

While much of the textbook's discussion covers firms operating in so-called perfectly competitive markets, the authors remind students of the dominant generalization in the economics of firms which is the profit maximization motive: "Keep in mind, though, that all types of firms (not just those in perfectly competitive markets) are profit maximizers. The profit-maximizing output level for *all* firms is the output level where [marginal revenue equals marginal cost]" (p. 213).

In subsequent chapters, Case et al. (2012) introduced the role of employees in the firm as that of a factor of production—an input for the production of the firm's output but only having derived demand: "In input markets, the reason we demand something is not because it is itself useful, but because it can be used to produce something else that we want" (p. 247). A further qualification is that labor input is substitutable with other inputs: "If labor becomes expensive, some labor-saving technology—robotics, for example—may take its place" (p. 254).

The above textbook characterization of the firm emphasizes the primary importance of profit maximization as the firm's purpose and the instrumental and substitutable role of the employee as a factor input. Case et al. (2012) presented this model of the firm as a series of assumptions and assertions, illustrated by extensive graphical presentations and mathematical equations, without empirical support or, for that matter, any in-text citation of sources or references at the end of chapters. This makes the firm model essentially a normative one in that it specifies not what a firm actually does, but what it should do (Zey, 1998). In short, the abstract model of the firm simply supports the allegation that firms are profit maximizers (Boland, 1989).

This presentation of the firm as a profit maximizer is consistent with that of Nobel Laureate Paul Samuelson in his 1948 introductory textbook *Economics* (as cited in Nelson, 2001):

> The correct (equilibrium) set of prices of consumption goods and of productive services, the market quantities of outputs and inputs—all these are "unknowns" whose numerical values are determined by a vast set of "simultaneous equations": the condition that all prices be equal to producers' "marginal costs," and to consumers' relative "extra utilities"; that wages equal "marginal revenue productivities"; that profits be at a maximum, etc. (p. 56)

Such normative assertions, whether by Samuelson in 1948 or Case et al. in 2012[1], targeted at young students and supplemented by

extensive mathematical expressions comprise a potent and persuasive rhetorical device which has been characterized as literary and metaphorical (McCloskey, 1983). Nelson (2001) likened this to a religious message in its inspirational value:

> None of the claims Samuelson made for the market mechanism rested on any strong scientific foundation, as leading economists over the next fifty years would increasingly conclude. In retrospect, as in Marxism and other systems of economic thought before it, the greatest attraction of Economics was its underlying inspirational message. (p. 58)

The dominance of the profit maximizing model of the firm in foundational economics education, especially couched in the rhetoric of mathematics, has implications for how students think about their own economic behavior and has been lamented by management scholars (Ghoshal, 2005). Frank, Gilovich, and Regan (1993) investigated the impact of taking a course in microeconomics on students' views on cooperation. The authors posed ethical dilemmas to students in two microeconomics classes and to one astronomy class as control group at the start of the term. One dilemma involved a small business owner being shipped with 10 microprocessors but being billed for only nine and posed the question of whether the student would inform the company of the error. Results indicated that 41.7% of the first microeconomics class and 34.8% of the second reported less honest responses at the end of the class than at the start, much higher proportions than the 23.3% result for the astronomy class control group. The study, thus, confirmed that student exposure to the profit maximizing view of the firm led to less socially responsible attitudes and planned behavior.

More recently, Wang, Malhotra, and Murnighan (2011) assessed the effects of economics education on perceptions of greed and greedy action using three studies with varying methods. They hypothesized that (1) increases in economics education will be associated with increasingly greedy action and decreasing concerns for fairness, and (2) increases in economics education will be associated with increasingly positive perceptions of greed. The results from all three studies indicated a positive relationship between economics education and attitudes toward greed.

THE COMMON GOOD AS A FOUNDATIONAL PRINCIPLE FOR A MODEL OF THE FIRM

Business has been assigned a special role in Philippine society for the promotion of every citizen's welfare. The Philippine Constitution refers to the "common good" half a dozen times. In particular, Article XII, on National Economy and Patrimony (De Leon, 2002) stated that:

> Section 6. The use of property bears a social function, and all economic agents shall contribute to the common good. Individuals and private groups, including corporations, cooperatives, and similar collective organizations, shall have the right to own, establish, and operate economic enterprises, subject to the duty of the State to promote distributive justice and to intervene when the common good so demands. (p. 365)

Thus, while the right to private property of business founders is fully recognized, such a right is not absolute. It is always subordinate to the mandate for all business firms to support the development of all and to share with others their just share of the fruits of production. In particular, Article XIII on Social Justice and Human Rights states that:

> Section 1. The Congress shall give highest priority to the enactment of measures that protect and enhance the right of all the people to human dignity, reduce social, economic, and political inequalities, and remove cultural inequities by equitably diffusing wealth and political power for the common good.

> To this end, the State shall regulate the acquisition, ownership, use, and disposition of property and its increments. (p. 390)

Similarly, the Explanatory Note to the 1980 Corporation Code (De Leon, 2001) reinforces the distributive role of business, particularly that of corporations:

> the … Code seeks to establish a new concept of business corporations so that they are not merely entities established for private gain but effective partners of the National Government in spreading the benefits of capitalism for the social and economic development of the nation. (p. 183)

Thus, the spirit of the Philippine Constitution and Corporation Code calls on business firms to contribute to the common good, that is, to an environment which allows individuals access to the means for their personal development.

The common good is a complex concept. Mark Lutz (1999), in *Economics for the Common Good*, explained that:

> …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)

It should be noted that Lutz's definition refers to allowing for the provision of all members, and not just for the most number of members of a community. This differentiates the "common good" concept from the equally commonly-used concept of "the greatest good for the greatest number." The common good excludes no one.

The Catholic Church has been expounding on the concept of the common good since the 19th century. Velasquez, Andre, and Shanks (2003) gave a useful summary:

> The Catholic religious tradition, which has a long history of struggling to define and promote the common good, defines it as "the sum of those conditions of social life which allow social groups and their individual members relatively thorough and ready access to their own fulfillment." The common good, then, consists primarily of having the social systems, institutions, and environments on which we all depend work in a manner that benefits all people. Examples of particular common goods or parts of the common good include an accessible and affordable public health care system, and effective system of public safety and security, peace among the nations of the world, a just legal and political system, and unpolluted natural environment, and a flourishing economic system. Because such systems, institutions, and environments have such a powerful impact on the well-being of members of a society, it is no surprise that virtually every social problem in one way or another is linked to how well these systems and institutions are functioning. (para. 3)

The common good principle, therefore, not only aspires for development for all members of a society but to achieve such through social systems and institutions. Relationships among people are important, beyond whatever market transactions they may be party to. Moreover, in practice, an important operationalization of the common good has been through the giving of living wages for employees. A living wage is more than the minimum wage and allows an employee to support a family and even have discretionary income. Brenner (2002) presented methods for measuring the living wage.

Unfortunately, business growth in the Philippines has consistently failed to improve the country's poverty situation. This has led government and various sectors to call for more inclusive growth which has been clearly the intent of the Constitution all along.

While the standard textbook model of the firm considers the employee as a substitutable factor of production—a commodity—the common good principle sees him as a human being

deserving access to integral development through participation in the firm's activities (Teehankee, 2008a). Employee development, therefore, becomes an explicit goal of the business owner, higher in importance although supported by traditional financial goals. An explicit support for the humanistic priority of labor over capital in business can be found in Catholic Social Teachings (Pontifical Council for Justice and Peace, 2004):

> Labour has an intrinsic priority over capital. This principle directly concerns the process of production: in this process labour is always a primary efficient cause, while capital, the whole collection of means of production, remains a mere instrument or instrumental cause. (p. 174)

The treatment of employees as merely instrumental to production and the achievement of high profits as suggested by textbook economics are ethically problematic from the point of view of the common good[2], especially if this results in exploitative wages or inhumane working conditions. What would such a company look like? Hon Hai Precision, the Taipei-based manufacturer better known as Foxconn is China's largest private employer and is the dominant consumer manufacturer today, producing an estimated 40% of global output for Apple, Dell, Hewlett-Packard, Sony, IBM, Nokia, Amazon, among others. According to BusinessWeek, when Foxconn agreed to make expensive investments to meet Apple's exacting standards for producing the iPhone 4, then Apple COO Tim Cook remarked: "He's a trusted partner and we are fortunate to work with him" (Balfour & Culpan, 2010, para. 27).

In 2012, at the behest of Apple and after increasing media reports of suicides and worker unrest at Foxconn plants, the Fair Labor Association (FLA) investigated conditions at the company's facilities in China. The FLA (Fair Labor Association, 2012, p. 2) reported that: (1) "there were periods during which some employees worked more than seven days in a row without the required minimum 24-hour break," (2) "workers were largely alienated, in fact or in perception, from factories' safety and health committees and had little confidence in the management of health and safety issues," and (3) "14% of the workers may not receive fair compensation for unscheduled overtime." Foxconn has agreed to implement remedial measures for these issues.

In a BusinessWeek interview Terry Gou, founder and chairman of Foxconn, admitted that he failed to see the significance of the worker suicides in his plants early enough: "The first one, second one, and third one, I did not see this as a serious problem. We had around 800,000 employees, and here [in Longhua] we are about 2.1 square kilometers. At the moment, I'm feeling guilty. But at that moment, I didn't think I should be taking full responsibility" (Balfour & Culpan, 2010, para. 4).

If Gou was behaving as a profit-maximizer and, by his leadership, encouraged his factory managers to deprive the employees of what they deserved as human workers, he would be morally responsible for the harms caused (Barrera, 2011).

What would a company who observed common good principles look like? Golden ABC, the Cebu-based fashion brand group led by Bernido Liu (Que, 2010) presents an example. Liu's leadership and management practices strongly influence norms within the company and this has led to positive outcomes for employee development, notably in the areas of moral development, health, and social development (through both outreach activities and a sense of work community) (Enriquez, 2013). The company avoids the contractualizing of retail personnel which is typically practiced in its industry. While Liu may not have built the largest and the most financially successful fashion brands company in the country, he has shown that values-based ethical practices, even if they carry a financial cost for the company, can be compatible with business success in the long term (Personal communications, July 3, 2013). Liu was recently awarded the Grand Bossing Award in the 2013 MVP Bossing Award organized by Philippine

Long Distance Telephone (PLDT SME Nation, 2013).

Recent formal economic models have become available which focus on the goal of assuring opportunities for all instead of the self-interest of a few, consistent with the common good principle. Ali and Son (2007) proposed a social opportunity function indicating the extent to which a population's less endowed members are still able to access life essentials such as health and educational services. Mariotti and Veneziani (2012) presented a model for a society where the social objective is to maximize the chance that everybody succeeds. In their model, the lack of opportunity for success of even one individual results in the lowest evaluation possible for the society. While not pertaining to firms per se, these models suggest the possibility of construing the firm as an opportunity-providing nexus for all stakeholders in a value chain (e.g., a firm and its supplier), a clear departure from the maximization of profits for owners.

MODELLING A COMMON GOOD FIRM

In this section, we describe a static model of a firm that takes into account the opportunities available to its workers. The current analysis, however, does not involve a general equilibrium approach, which may be reserved for future developments.

Firm

Consider a firm with production function $F(S, L_F, \gamma(\nu))$ where S is the number of suppliers of a particular input for production, L_F is the labor requirement of the firm for production, which we will refer to as the "compliant effort," and $\gamma(\nu)$ is an effort function of the laborer given the level of benefit ν. We will call g the "committed effort." Define the profit function of the firm, denoted Π_F:

$$\Pi_F := pF\left(S, L_F, \gamma(\nu)\right) - \left[p_S S + w_F L_F + \delta(\nu)\right] \qquad (1)$$

where p is the price of the output of the firm, p_S the price of the inputs to the firm from the suppliers S, w_F is the labor wage, and $\delta(\nu)$ is the cost to the firm of providing benefit to laborers.

The suppliers are represented by a single production function $G(L_S, \gamma(\nu))$ where L_S is the labor requirement of the suppliers with corresponding wage w_S. The suppliers' production function is also subject to the same committed effort (as in the case of the firm), with accompanying cost of provision, given by the same function $\delta(\nu)$. We define the profit function of the suppliers as

$$\Pi_S := p_S G\left(L_S, \gamma(\nu)\right) - \left[w_S L_S + \delta(\nu)\right] \qquad (2)$$

We assume that the production functions are concave and twice continuously differentiable. We further assume the following property: if at least one argument in a production function is zero, then production ceases (the case of an interior solution). We assume concavity for the committed effort and convexity for the cost of provision of benefit. Further, we assume that these functions are twice continuously differentiable.

Assuming perfect competition (in the firm and suppliers' respective markets), we take all prices p, p_F, and p_S as given. In addition, we assume that laborers can freely choose to decide to work either for the firm or for the suppliers, and that $w_S \neq w_F$.

Applying necessary condition for unconstrained optimum, we have the following equations:

$$\nabla \Pi_F = \begin{bmatrix} pF_S'\left(S, L_F, \gamma(\nu)\right) - p_S \\ pF_{L_F}{}'\left(S, L_F, \gamma(\nu)\right) - w_F \\ pF_\gamma'\left(S, L_F, \gamma(\nu)\right)\gamma'(\nu) - \delta'(\nu) \end{bmatrix} = \begin{bmatrix} 0 \\ 0 \\ 0 \end{bmatrix} \qquad (3)$$

Immediate from the above, the first two equations give the standard results from microeconomic theory: the value of the marginal product of inputs must equal the input prices. Moreover, the last equation presents that the marginal benefit (to the firm) of a unit of committed effort of laborers is proportional to the cost of providing benefit, given by a factor, which

is the value of the marginal product of committed effort. This equation can be rewritten as

$$pF'_{\gamma}\left(S,L_F,\gamma(\nu)\right)=\frac{d\delta}{d\nu}\Big/\frac{d\gamma}{d\nu},\quad d\nu\neq 0 \qquad (4)$$

Simplifying, we obtain, at the optimal ν*,

$$pF'_{\gamma}\left(S,L_F,\gamma(\nu^*)\right)=\frac{d\delta}{d\gamma} \qquad (5)$$

Suppliers

Doing a similar argument for the case of the suppliers, we obtain the following by the necessary condition of an unconstrained optimum:

$$\nabla\Pi_S=\begin{bmatrix} p_S G_{L_S}{}'\left(L_S,\gamma(\nu)\right)-w_S \\ p_S G'_{\gamma}\left(L_S,\gamma(\nu)\right)\gamma'(\nu)-\delta'(\nu)\end{bmatrix}=\begin{bmatrix}0\\0\end{bmatrix} \qquad (6)$$

As in the case of the firm, the first equation in (6) means that the value of the marginal product of labor is the wage rate. We also observe a similar case as in the firm: the marginal benefit (to the suppliers) of a unit of committed effort of laborers is proportional to the cost of providing benefit, given by a factor, which is the value of the marginal product of committed effort. This can also be rewritten as

$$p_S G'_{\gamma}\left(L_S,\gamma(\nu)\right)=\frac{d\delta}{d\nu}\Big/\frac{d\gamma}{d\nu},\quad d\nu\neq 0 \qquad (7)$$

Simplifying, we obtain, at the optimal ν*,

$$p_S G'_{\gamma}\left(L_S,\gamma(\nu^*)\right)=\frac{d\delta}{d\gamma} \qquad (8)$$

Labor

To keep the analysis simple for this baseline model, we assume that a representative worker receives opportunities y_i, as per Ali and Son (2007), which is dependent on their wage given to them by their employer, which can be the firm or the supplier. Opportunities for individual i is denoted as y_i and can take binary values of 0 and 100.

Defining ω as the "living wage," that is, "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 ω, as well as additional benefits, from their employer.

Hence, we have

$$y_i=\begin{cases}100, & w_S,w_F\geq\omega\\ 0, & w_S,w_F<\omega\end{cases} \qquad (9)$$

which expresses that if an individual does not receive the living wage, then they will choose not to work, that is, $L_i = 0$. This is an assumption which may be relaxed later; however, for this baseline model, we would like to assess the scenario where workers only provide labor when they receive the living wage and receive benefits. 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.

ANALYSIS AND RESULTS

Assuming that the living wage is the rate faced by the workers, offered by both the firm and the suppliers, then, we obtain from the respective necessary conditions that

$$p_S G_{L_S}{}'\left(L_S,\gamma(\nu)\right)=\omega=pF_{L_F}{}'\left(S,L_F,\gamma(\nu)\right) \qquad (10)$$

.Re-expressing (10), we obtain

$$\frac{p_S}{p}=\frac{F_{L_F}{}'\left(S,L_F,\gamma(\nu)\right)}{G_{L_S}{}'\left(L_S,\gamma(\nu)\right)} \qquad (11)$$

Observe that from the first equation of the necessary condition of the firm, we have

$F_S'\left(S, L_F, \gamma(\nu)\right) = p_S / p$. Thus, substituting this to (11), we obtain

$$F_S'\left(S, L_F, \gamma(\nu)\right) = \frac{F_{L_F}'\left(S, L_F, \gamma(\nu)\right)}{G_{L_S}'\left(L_S, \gamma(\nu)\right)} \quad (12)$$
$$\Rightarrow G_{L_S}'\left(L_S, \gamma(\nu)\right) = \frac{F_{L_F}'\left(S, L_F, \gamma(\nu)\right)}{F_S'\left(S, L_F, \gamma(\nu)\right)}$$

By the hypothesis on F, applying the implicit function theorem, we have

$$\frac{F_{L_F}'\left(S, L_F, \gamma(\nu)\right)}{F_S'\left(S, L_F, \gamma(\nu)\right)} = -\frac{dS}{dL_F} = G_{L_S}'\left(L_S, \gamma(\nu)\right) \quad (13)$$

which is precisely the slope of the production function F, holding committed effort $\gamma(\nu)$ constant (say, at the optimal benefit level ν^*), called the marginal rate of technical substitution of S relative to L_F. Equation (13) also implies that as the marginal productivity of labor to the supplier increases, the firm is more willing to substitute supplier's output for labor as inputs.

Also observe that since committed effort and cost of provision of benefit functions are identical for the firm and the suppliers, we have, from the respective necessary conditions,

$$p_S G_\gamma'\left(L_S, \gamma(\nu)\right)\gamma'(\nu) = \delta'(\nu) \quad (14)$$
$$= pF_\gamma'\left(S, L_F, \gamma(\nu)\right)\gamma'(\nu)$$

and from the definition of $\delta(\nu)$ and $\gamma(\nu)$, we have, at ν^*, $\gamma(\nu^*), \delta(\nu^*) \neq 0$. Thus, re-expressing (14), we obtain

$$\frac{p_S}{p} = \frac{F_\gamma'\left(S, L_F, \gamma(\nu)\right)}{G_\gamma'\left(L_S, \gamma(\nu)\right)} \quad (15)$$

Again, using the fact that $F_S'\left(S, L_F, \gamma(\nu)\right) = p_S / p$, we obtain

$$F_S'\left(S, L_F, \gamma(\nu)\right) = \frac{F_\gamma'\left(S, L_F, \gamma(\nu)\right)}{G_\gamma'\left(L_S, \gamma(\nu)\right)} \quad (16)$$
$$\Rightarrow G_\gamma'\left(L_S, \gamma(\nu)\right) = \frac{F_\gamma'\left(S, L_F, \gamma(\nu)\right)}{F_S'\left(S, L_F, \gamma(\nu)\right)}$$

By the hypothesis on G, applying the implicit function theorem, we have

$$\frac{F_\gamma'\left(S, L_F, \gamma(\nu)\right)}{F_S'\left(S, L_F, \gamma(\nu)\right)} = -\frac{dS}{d\gamma} = G_\gamma'\left(L_S, \gamma(\nu)\right) \quad (17)$$

which is the marginal rate of technical substitution of γ relative to S, now holding L_F constant, that is, the relative change of the inputs γ relative to S in the production function F of the firm. Equation (17) also implies that as the marginal productivity of committed effort to the supplier increases, the firm is more willing to substitute suppliers output for committed effort as inputs.

Hence, the marginal product of labor of the supplier—either compliant or committed—must be equal to the respective marginal rate of technical substitution, given by (12)-(13) and (16)-(17).

Observe that rearranging the terms in (15), we will obtain the following:

$$p_S G_\gamma'\left(L_S, \gamma(\nu)\right) = pF_\gamma'\left(S, L_F, \gamma(\nu)\right) \quad (18)$$

which is precisely equating the value of the marginal product of committed effort for both the firm and the supplier. Note that this does not require the worker receiving the living wage, unlike in (10), where equality of the value of marginal product of compliant effort for both the firm and the supplier happens *only if* both "economic agents offer the wage rate at least at the level of the living wage."

Model Summary

In this model, we have three economic agents: the firm, the suppliers, and labor. 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, as expressed in equations (3) and (6). 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. Although not currently explicit in the model, this may lead to further model developments in the firm, supplier and labor working together to achieve their own objectives.

CONCLUSION AND RECOMMENDATIONS

This paper aimed to respond to the PRME challenge to research on new frameworks which can have educational value towards the education of business students to be more socially responsible. The use of profit maximizing models in teaching the economics of the firm has been shown to negatively influence student attitudes towards responsible social behavior. The preliminary model developed in this paper, based on a rudimentary common good argument for assuring benefits for employees of the firm and those of its supplier while pursuing profit, can be used to provide students a wider exposure to alternative conceptions of the purpose and behavior of firms.

Future development of the model should include other stakeholders such as customers and community members (say, as users of the environment) so as to better reflect the common good. Also, the model may reflect a dynamic time horizon for profit seeking (and not necessarily maximizing profit since this has had problematic pedagogical impacts on students) as well as competitive dynamics to be more realistic.

Empirical tests of the pedagogical impacts of using the model in class, in the sense of Wang et al. (2011), can help show if it is having the intended attitudinal influence on business students.

NOTES

[1] The profit maximizing strategy of a business firm was explained in prose in 1890 by the acknowledged father of neo-classical economics, Alfred Marshall: "At the beginning of his undertaking, and at every successive stage, the alert business man strives so to modify his arrangements as to obtain better results with a given expenditure, or equal results with a less expenditure. In other words, he ceaselessly applies the principle of substitution, with the purpose of increasing his profits; and, in so doing, he seldom fails to increase the total efficiency of work, the total power over nature which man derives from organization and knowledge" (Marshall, 1920). Marshall himself was influenced by the mathematical demonstration of a monopolist's profit maximization by Antoine Augustin Cournot in 1838 (Cournot, 1897).

[2] Aside from legal and normative arguments, Blair (1999) has summarized key arguments of economists that employees' firm-specific investments in human capital is as important as the investments of shareholders.

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