Multi - Level Marketing : An Economic Model

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Abstract

This paper developed a simple economic model of multi-level marketing that captured two fundamental aspects of the intrinsic structure of multi-level marketing: (a) sequential entrance into the market, and (b) the lack of information on the number of competing sellers. The sequential aspect of entrance into the market leads to "the first mover bias." This leads to initial entrants' capturing large surpluses and removes the incentive for latter entrants to enter the market, resulting in less than full market penetration under complete information. The lack of information on the competing sellers, mixed with a signaling mechanism and an upstream commission for recruitment, creates an incentive to send false signals. This leads to entrants with resulting negative profits. Depending on the parameters of the model, this can lead to a very large percentage of participants to be negative earners with a small percentage reaping large rewards. These results indicate that stricter discloser laws regarding the number of participants and their earnings should be considered. Furthermore, if such laws are enforced, multilevel marketing firms will need to seek alternative payment schemes to ensure market saturation of their products.

Keywords: **economic model, multilevel marketing, sequential entrance, lack of information**

Paper Submission Date : October 27, 2014; Paper sent back for Revision : February 5, 2015 ; Paper Acceptance Date : February 23, 2015

Multi-level marketing (MLM) is a marketing strategy in which the sales force is compensated not only for sales they personally generate, but also for the sales of the other salespeople that they recruit. This recruited sales force is referred to as the participant's "downline," and can provide multiple levels of compensation. Other terms used for MLM include pyramid selling, network marketing, and referral marketing. The buyer-seller relationship paradigm (Kang & Jindal 2014; Kang, Oh, & Sivadas, 2012, 2013) can be applied to MLM. Furthermore, qualitative approaches (Kang, 2012; Kang, 2014 a, b, c ; Kang, 2015; Kang & Kang 2014; Yang, Sivadas, Kang, & Oh, 2012) and quantitative approaches need to be applied to MLM, too. Especially, quantitative approaches have lacked in the MLM area. MLM companies are cyclically in the spotlight regarding their legitimacy, or even legality, as a business model. Recently, this spotlight moved heavily onto Herbalife (HLF) with the continued bearish and ruthless assault by Pershing Square Capital Management's CEO William Ackman. So fierce was his opposition to Herbalife's business model that he invested $1 billion in short positions (some of which were converted to long-term put options in October of 2013). Regardless of Mr. Ackman's opposition, MLM companies are not a small part of the American economy. Direct Selling Association (DSA), the main trade association for MLM firms, estimated the size of the market for 'directly sold' products to be almost $33 billion in the U.S. in 2013 and the number of participants to be just under 16 million in 2012.

Moreover, this business model is not an unstudied area (see Keep & Nat, 2014 for a recent historical overview of MLM companies). There is considerable research focused on the ethical issues raised by the structure of MLM companies (Albaum & Peterson, 2011 ; Bloch, 1996 ; Koehn, 2001), the unique characteristics of those involved in MLM firms (Brodie, Stanworth, & Wotruba, 2002 ; Pratt, & Rosa, 2003), potential conflict between friendship and

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business relationships in MLM participants (Grayson 2007), the public's perception of MLM firms' products (Kustin & Jones, 1995), and the unique role of leadership in such organizational settings (Sparks & Schenk, 2001). However, there are few papers explicitly modeling the economics of MLM firms. Two notable exceptions are Bhattacharya and Mehta (2000) and Coughlan and Grayson (1998).

Coughlan and Grayson (1998) focused on modeling compensation plans, how this affects participants' decisions regarding 'sales versus recruitment,' and the subsequent effects on network growth and overall profitability of the network. Their main contribution is a rigorous model that examines the unique roles of specific parameters of compensation plans for network growth. Bhattacharya and Mehta (2000) took, as their starting point, the assumption that (possibly) most MLM participants earn very little (while hard statistics are hard to come by regarding participants' profits, both legal and journalistic investigations seem to suggest that the overwhelming majority of participants do not earn profits [1]). They developed a model to explain the "apparent contradiction of minimal pay and such huge involvement" (p. 362). Their main contribution is to highlight the possible role social satisfaction plays in determining individuals' choice to participate in MLM schemes and how this might explain the 'apparent contradiction'.

The current paper adds to the literature on MLM firms by developing an economic model that fits somewhere in between those of Coughlan and Grayson (1998) and Bhattacharya and Mehta (2000). Rather than focusing upon the details of the compensation plans and their effects on network growth as the former does, this paper's model seeks to understand the characteristic, that is, the starting point of the latter. The model developed in the paper would help to understand the economic origins of the perceived low, or even negative, profits of the majority of the MLM participants. Though simple, the model captures the fundamental structure of MLM schemes. Briefly, the main findings are as follows. Under perfect information regarding profitability, relatively few people enter the system, and the market does not become saturated (the exact definition of saturation is defined in the next section). With imperfect information and incentives to recruit, many more participate and the market can become saturated, but the overwhelming majority of participants earn negative profits.

The Market and Standard Model

Assume there is a fixed market in which customers must be 'found' by an agent (seller) who has one unit of time. The 'size' of the market is implicitly defined by the externally set wage rate *'w'* and the production/sales function faced by the agents as follows. The market can be divided into N 'areas' which are defined by the amount of sales a person can find using their full unit of time. In any area, the production function is:

$$f(t_s) = t^{\alpha}_{s} \; where \; 0 < \alpha < 1$$

There is a compensation paid for each unit sold −δ - and there is a fixed cost to selling in the market − FC. So, each person, when confined to their area, solves the problem:

$$max t_s \; \delta t^{\alpha}_{s} + w(1 - t_s) - FC$$

where,
$FC = 0$ if $t_s = 0$

The area is *defined* by $t_s = 1$, so from the first order condition, we get $\delta\alpha = w$.

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[1] See for example. The pyramid scheme industry: Examining some legal and economic aspects of multi-level marketing by Douglas Brooks, Robert Fitzpatrick, and Bruce Craig, March 2014. Marketing group merely selling a dream by David Brown, The Times, November 2007. What kind of business do you want to start? by Laura Peterecca, USA Today, September 2009. Fortune Hi-Tech: American dream or pyramid scheme? by Jayne O'Donnell, USA Today, October 2010.

Figure 1. General and Simplified Multilevel Marketing

Figure 1(a). General Multilevel Marketing

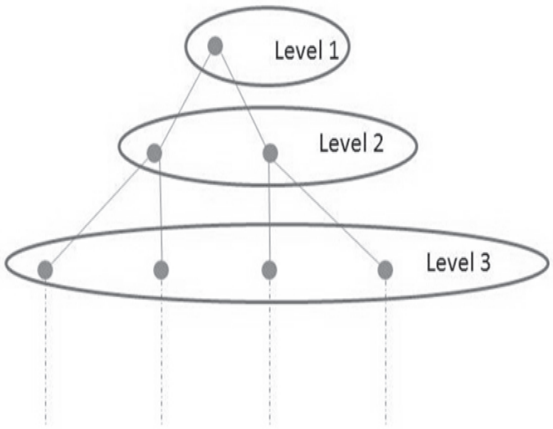
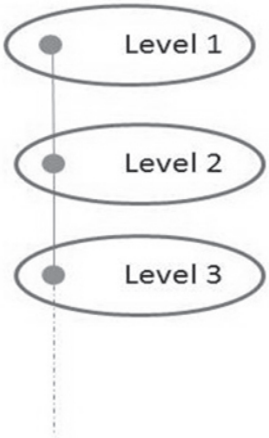


Figure 1(b). Simplified Multilevel Marketing



Furthermore, sales for each area are 1. Moreover, if we assume zero economic profits, this implies:

$$\pi = \delta - w - FC$$

$$= \frac{w}{\alpha} - w - FC = 0$$

Implying:

$$FC = \frac{1-\alpha}{\alpha} w$$

Note that with N areas, total sales = N. This is what we call 'market saturation' : given the number of areas and the wage rate, this is the most that will be sold. Think of the above as each area being a store in a part of a city where stores do not compete with each other. This is what we call a 'standard business model' for lack of a better term. What we wish to see is what is the outcome if, rather than a standard model, a company instead initiates a multilevel (network) marketing approach. With the market and sales function defined as above, we can now investigate alternative business models.

The Multilevel Structure

In general, a multilevel or network marketing structure does not rely on a company to divide the market up into areas, but rather, allows the network of sellers to 'grow'. In general, the structure resembles a tree structure as shown in the Figure 1(a). So one person sells, and recruits others below them to sell, who then also recruit others below them to sell. Though different companies have different specific structures, the spirit of the system is captured here. What we will model below is the effect of a 'simplified' model as shown in the Figure 1(b). Though simplified, we believe this version still captures the needed characteristics to understand the main mechanisms. Modeling a more complicated structure is unlikely to reveal any more insights while simply making understanding the underlying mechanism harder.

What we will model is a sequential selling model, where each seller enters after the other. The first entrant faces

the 'full market' production function, while the later entrants face the 'reduced market' production functions. That is, the first entrant into the market is not restricted to an 'area' as in a standard model, but is free to roam the entire market. Specifically, if a person is the *X*th entrant, then they face a production function :

$$f_x(t) = N^{1-\alpha}(t+(X\text{-}1))^{\alpha} - N^{1-\alpha}(X-1)^{\alpha}$$

This sales function is the result of a maximized function over the entire market. In essence, this allows early sellers to sell to capture all 'low hanging fruit' in the entire market. All entrants face the same FC derived above [2]. So, each new entrant faces a 'reduced' production function. This captures two facts: (a) previous sellers have already captured some of the markets, and (b) each new 'level' has more sellers than the previous. So, while we do not explicitly model the tree structure, this production function can be viewed as reflecting part of that process. This aspect of the model captures the essence of the sentiment of Keep and Nat (2014) "....distributors face all against all competition..." (p. 5). First order conditions easily show: $t^* = N - X + 1$, so as long as $X < N$, the FOC implies the entrant supplies their full unit of labor. Of course, whether they enter or not depends on profits.

Note that with supplying full unit of labor, the *X*th entrant produces/sells:

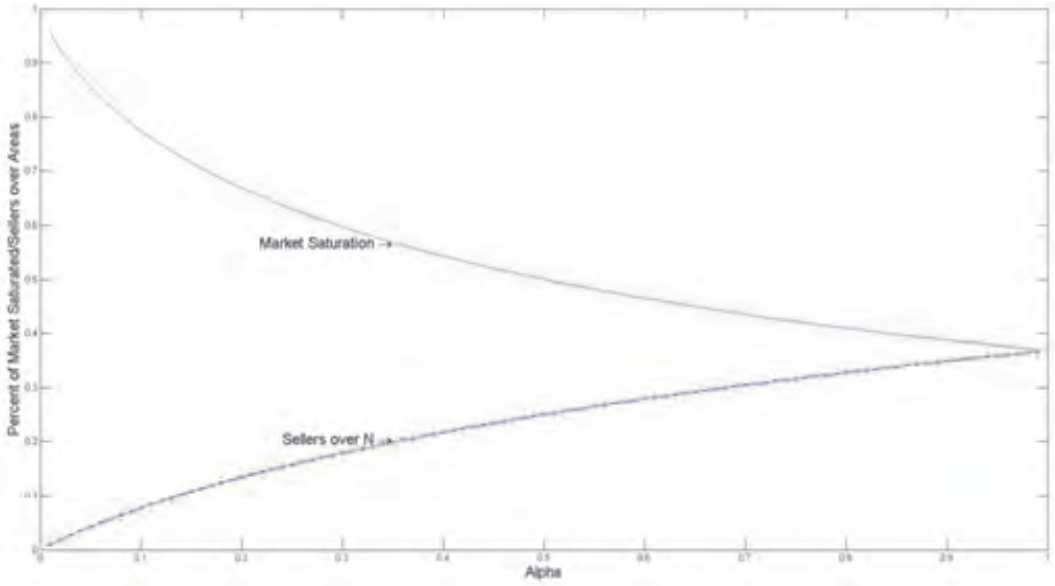
$$N^{1-\alpha}(X^{\alpha}-(X-1)^{\alpha})$$

and their profits are (using definition of δ):

$$\pi_x = (N^{1-\alpha}(X^{\alpha}+(X-1)^{\alpha})-1)\frac{w}{\alpha}$$

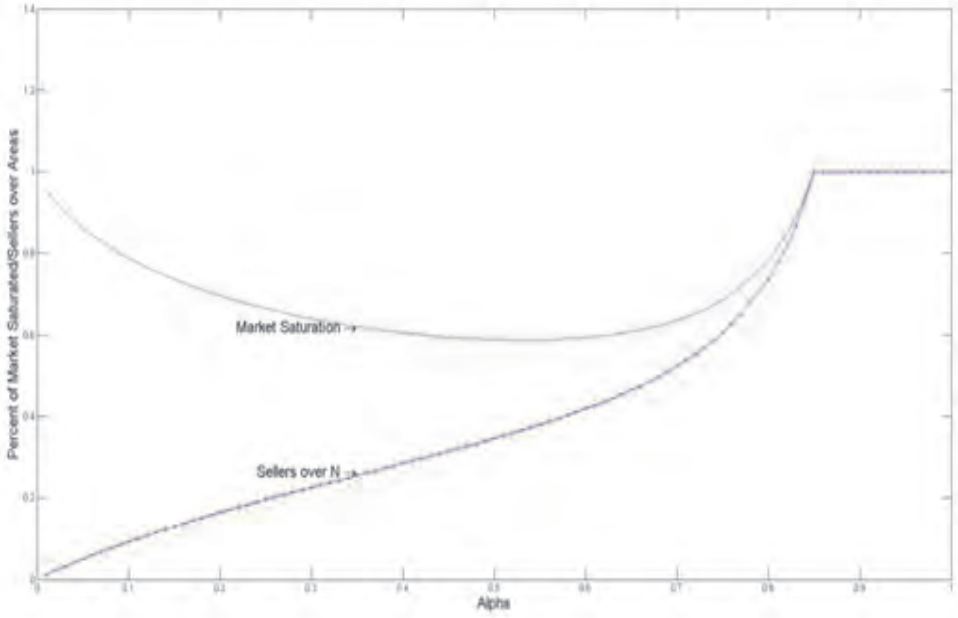
Figure 2. Number of Sellers/*N* and the Resulting Market Saturation Percentage Dependent on α

Figure 2(a). Zero Profit Base



[2] This fixed cost can have a wide interpretation. Some companies actually require some initial start-up cost, though we think the main aspect covered by the fixed cost is the time foregone in learning/entering the business. Though we do not explicitly model this as a time fixed cost or include leisure explicitly in the model, this seems a natural interpretation.

Figure 2(b). Positive Profit Base



The number of sellers in this sequential selling structure is implicitly defined in the above by those entrants who would earn positive profits. The proportion (number of sellers/*N*) and the resulting market saturation percentage is dependent only on α (once *N* is sufficiently large) - and not on δ or *w* because these are linked by the zero profit *FC*. The Figure 2(a) displays these percentages in relation to α. When α is very close to zero, the MP of the first sellers is very large, and they nearly capture the whole market, and as α grows, they capture less and less, implying more participants enter, though not enough to saturate the market because of the *FC*. It is to be noted that this result is not (qualitatively) dependent on the zero profit in the standard *N* areas for reasonable levels of α. We can redefine the *FC* as a percentage of the zero *FC* profits - thus allowing profits in the standard *N* model - and still achieve similar results. The Figure 2(b) depicts these results, but with the *FC* at 80% of the zero *FC* profits (i.e., $FC = 0.8\ \frac{1-\alpha}{\alpha}\ w$). When α is small, the same properties for the zero profit base drive the shape. However, as α approaches 1, the production function becomes linear and the presence of profits begins to take hold, driving up market saturation and participation.

Signaling and 'Upstream Commission'

The above model introduced the sequential aspect to selling, but not the compensation aspect of the multilevel marketing structures. We do this here.

Say that fixed cost payment occurs before production, so once one is 'signaled' to enter, they pay the fixed cost, then realize production function, and operate as normal maximizing profits. This seems to match what occurs in reality - time is invested in learning the business, and so forth, after which one begins selling. Furthermore, it is to be noted that the parameter relevant to a worker's entrant is their *'X'* - their entrance ranking - or more simply, whether they will earn a profit or not.

Assume an entrant is unaware of their *X* (their possible profitability), but this is signaled by the previous entrant. Thus, each entrant first enters and sells, then possibly signals the next entrant to enter. If the individual does enter, the person who signals them receives some commission based on their sales [3] - βδ (which is just a portion of their revenue) - but this signal is costly in the sense that it is costly to falsely signal profitability and becomes more costly the further away from the break even entry point one is (there is no cost to signal if profitability is true). The cost to

signal is $C_s = \rho\,(\frac{X}{N} - \gamma)\,FC$, where γ is the break even entry point (thus, the signal cost is in terms of the fixed cost). Whether a false signal is intentionally false or not is irrelevant. Simply that there is an incentive to signal, and it is likely to become more costly at later stages of entry is the aspect of reality captured here. This lack of information reflects the second part of the statement: "distributors face all against all competition ... with no verifiable information regarding the number of distributors in a given area at any given time" (Keep & Nat, 2014, p.5).

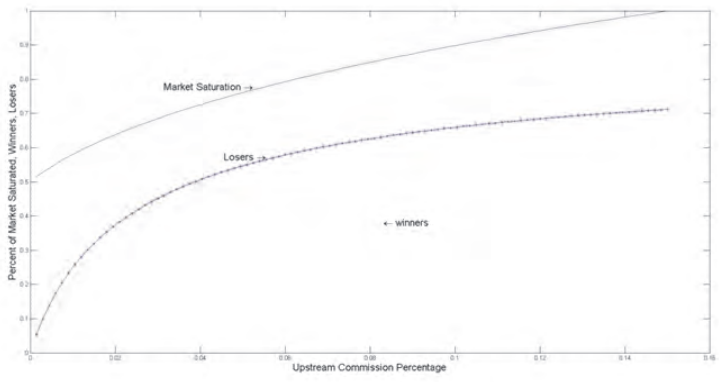
With this modification, we will get individuals entering who eventually have negative profits, while the market saturation increases. Let us take α as fixed at $\alpha = 0.5$. In this setting (based on the basic zero profit in standard condition *FC*), the break even entry point is at $\gamma = 0.25N$, and the market saturation under complete information is 50%. The main parameters determining the outcome are the signaling cost parameter - ρ - and the 'upstream commission' - β.

Setting the cost of falsely signaling low - say a 10% point reduction in the true standing *(X)* results in a cost 1% of the *FC* - then we get the outcomes regarding market saturation and percentage of sellers who are 'winners' (earn profit) and 'losers' (earn negative profits) in relation to β ('upstream commission percentage') in Figure 3(a). What we can see is that with only a 15% upstream commission, the market becomes saturated. At the same time, the percentage of sellers who are profitable steadily fall as the incentive to send false signals increases. Of course, the particular values are also dependent on the cost of the signal. In Figure 3(b), the cost of the signal is five times as costly as in Figure 3(a) - a 10% point reduction in the true standing *(X)* results in a cost 5% of the *FC*. Though the shapes of the graphs are the same, the values change. For example, with the higher signaling cost, it requires a 75% upstream commission to saturate the market. Furthermore, if the costs of signaling are increased even further, as in Figure 3(c), a 10% point reduction in the true standing *(X)* results in a cost 5% of the *FC* - we find that it requires more than a 140% commission to saturate the market. And with such high commission being paid out, the number of winners remains above the number of losers (as would be expected with such large pay-outs). Also, moving away from a zero profit base setting does not qualitatively change the results, it just merely shifts the need upstream compensation down to achieve the same outcome.

So, the main take away is that with a relatively low cost of signaling (which seems likely), it does not require very large upstream commissions to reach market saturation. However, in such a setting, the number of losers far outstrip the number of profitable entrants.

Figure 3. Market Saturation, Percentage of Winners and Losers Based on Upstream Commission Percentage (β)

Figure 3(a). Low β



[3] Again, this is a simplification from how most companies pay commission for recruiting. Many companies have complex payment systems involving thresholds, required number of recruits ('legs'), and other schemes. But again, this simplification still captures the main idea and allows easy modeling while maintaining the key aspect of the system.

Figure 3. Market Saturation, Percentage of Winners and Losers Based on Upstream Commission Percentage (β) (continued)

Figure 3(b). Medium β

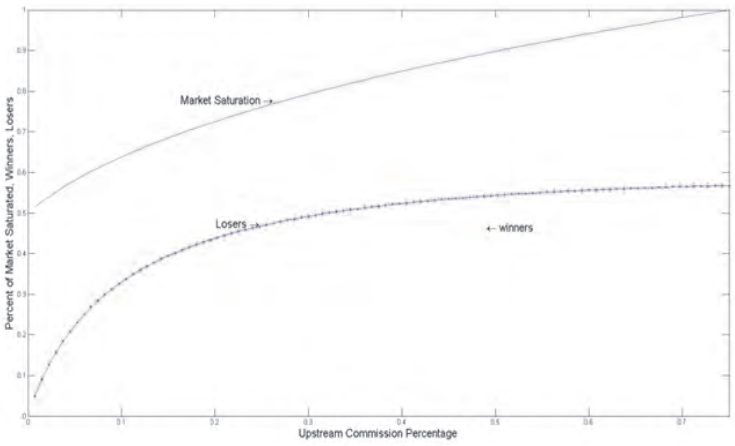
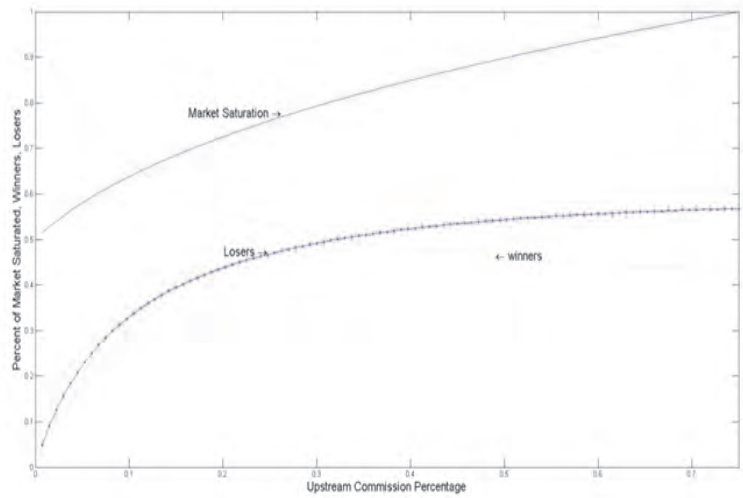


Figure 3(c). High β



Discussion

This paper develops a new economic model of multi-level marketing schemes, which sheds light on the economic underpinnings of the perceived overwhelming percentage of participants being 'losers' with the majority of earnings going to a few individuals. As a result, this paper enables researchers and practitioners to pay attention to the MLM mechanisms. The model's main driving mechanisms are the sequential nature of selling with a corresponding first-mover bias, the lack of knowledge on new participants regarding possible profitability, and a costly signaling linked to an upstream commission incentive. The basic model provides a simple starting point for researchers and practitioners to begin when investigating the implications of incentives and information on market saturation and market entry and has several key findings.

Theoretical Contributions

MLM has had various evaluations such as 'efficient marketing tool' or 'bad tactic'. This study explains the basic mechanism in MLM and provides some theoretical contributions as follows. First, the model proposed in this study implies that within a MLM structure, with complete information and a zero profit base model, the market will not become saturated due to first-mover capture of surpluses. Second, even in the presence of profits in the standard model, a similar result emerges dependent on the parameter of the sales function. Third, when information is lacking regarding profitability, but there is an incentive to signal new entrants, market saturation may still occur. In this latter setting, the percentage of participants with negative vs. positive profits is parameter dependent, though under reasonable settings, the number with negative profits is larger. Fourth, this study is the first effort to explain MLM with an economic approach. Fifth, this study expands the understanding of working mechanism in MLM. Our explanation can help researchers and practitioners understand and go to the basic mechanism in MLM.

Managerial Implications

This study has some managerial implications, which are as follows. First, the main findings of this paper indicate it should not be unexpected that a larger percentage of participants do not earn profits in MLM schemes. Though the model presented is simple, it captures the main characteristics of MLM structures that drive the results. Second, these results indicate that stricter discloser laws regarding the number of participants and their earnings should be considered. Third, if such laws are enforced, MLM firms will need to seek alternative payment schemes to ensure market saturation of their products. Fourth, these results are a lens for firms to see how their incentive structures can lead to ill behavior they likely wish to not be associated with (the false signaling). It highlights the unintended consequences of the incentive structure. Fifth, given the bad name many of these firms receive in some circles due to some participants' behavior, this model provides firms with a clear structure to consider incentives and requirements that might enhance their reputation.

Limitations of the Study and Future Research Directions

First, one shortcoming of the model presented is the one-sided nature of the strategic interaction between existing participants and new entrants. Expanding the model to allow for full strategic interactions and relationship factors such as trust, commitment, and relationship quality is an area of prime interest we leave for further research. Second, while we believe the model presented incorporates the main driving mechanisms of MLM payment schemes in general, further work on more complex incentive schemes and clearly identifying their compatibility with a simple base model is another area of key interest we leave for further research. Third, deriving incentive mechanisms that are less susceptible to the negative findings found here is certainly an area of great interest to MLM firms. This latter point is likely a valuable area for further research. Fourth, this is a conceptual study. Therefore, empirical approaches have a bright avenue in future research studies.

Acknowledgment

This research was supported by Kyungpook National University Research Fund 2012, and has benefited from several discussions with Mr. Mani Saini.

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