

Mechanisms of consumer boycotts: Evidence from the Nestlé infant food controversy

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Zimmermann, Nici (2011): Mechanisms of consumer boycotts: Evidence from the Nestlé infant food controversy, in: Proceedings of the 29th International Conference of the System Dynamics Society, Washington, DC.

Abstract

Quality criteria do not only relate to the products mere quality, but to the production and marketing process of the product as well. Customers often express their dissatisfaction with low ethical standards in this area by consumer boycotts. As there are complex relationships between financial aspects and compliance, a system dynamics model is used to unveil causal relationships and explain behavioral patterns. The model highlights the links between a company's dilemma situation and the effectiveness of a boycott for those demanding different corporate conduct. It also demonstrates possible levers for triggering different behavior.

Key Words

Consumer Boycott, Nestlé, System Dynamics

A Introduction

Quick supply of high quality products at affordable prices has for long been a principal demand of customers. It has equally been one of the major goals of production. However, many examples demonstrated that the product's mere quality needs to be extended to the production process, the distribution process, and to organizations' general and environmentally friendly behavior (Crane 2001, pp. 365–366; Mendleson and Polonsky 1995; Rode, Hogarth, and Le Menestrel 2008). These demands often concern the ethical dimension of the organizations' processes.

A possible expression of people's ethical demands and their dissatisfaction with the perceived firm behavior is a consumer boycott. It is "an attempt by one or more parties to achieve certain objectives by urging individual consumers to refrain from making selected purchases in the marketplace" (Friedman 1985, pp. 97–98). The most prominent cases demonstrating the people's ethical demands are probably the Nestlé boycott for more ethical marketing practices, the Shell boycott against the disposal of the Brent Spar oil platform in the sea, and the Nike boycott against child labor. As these examples show, dissatisfied campaigning organizations as well as customers often react by boycotting the respective companies. A laboratory experiment demonstrated that 52 percent of the study's participants stated they would be willing to boycott a company if it acts irresponsibly (Becker-Olsen, Cudmore, and Hill 2006, p. 52). There is historical evidence as well.

During the time of a major boycott of the Nestlé corporation, about 30 percent of Toronto's citizens who were aware of corporate practices and of the boycott actively joined it (INFACT - Infant Feeding Action Coalition 1982, p. 2, cited in Chetley 1986, p. 54). 16 percent of the population joined the boycott of a multinational selling consumer products after it had announced two factory closings (Klein, Smith, and John 2004, p. 101). While not everybody may engage in a boycott, studies found that consumers' purchasing decisions are strongly influenced by the ethical dimension of companies' behavior (De Pelsmacker, Driesen, and Rayp 2005; Environics International 1999).

With the presence of boycotts and high demands of the general population, desires of companies and the general public many times obviously clash. It is difficult to reconcile a low-cost orientation with high ethical demands on the production and distribution process. In the following theoretical part I will therefore describe boycotts as a dilemma of compliance for firms, refer to their effectiveness for boycotters, and will relate both. This relation is difficult to draw based on literature only. This is why I will present a system dynamics (SD) model of a selected boycott concerning the Nestlé corporation and the infant formula controversy. The model highlights the links between a company's dilemma situation and the effectiveness of a boycott for those demanding different corporate conduct. It also demonstrates possible levers for triggering different behavior.

B Compliance and the effectiveness of boycotts

B.I A dilemma of compliance

Customers expect firms to comply with their ethical standards or with the ethical standards of a society. It may be assumed that the respective companies may simply adapt to what their customers and the general public demand. In this case, it would only be a matter of time until firms comply with their environments' ethical requests. However, concerning the many scandals with an ethical underpinning it seems unlikely that firms simply adapt. Yet, hundreds of firms have been targets of boycotts over the last decades and these boycotts did not always lead to changes in their behavior (Friedman 1985, p. 108).

It has already been argued that individual participants face a social dilemma situation since they are torn between their ethical values and costs incurred by participating. In a similar vein, evidence suggests a dilemma for firms as well. Individuals need to believe that by their actions they can make a difference, and boycotters are generally motivated by their ethical values (Klein, Smith, and John 2004, pp. 100 and 105). Normative influence of a reference group also affects people's boycott likelihood (Sen, Gürhan-Canli, and Morwitz 2001, pp. 406 and 409). Nevertheless, boycotters also incur costs from withholding consumption. If costs are higher, e.g. because there are no product substitutes, people are less likely to participate in the boycott (Sen, Gürhan-Canli, and Morwitz 2001, p. 409). Since it is a social dilemma in which collective interests are in

conflict with private ones and since the overall influence of one individual is small, people would benefit from freeriding.

Similarly, boycotted companies are in a dilemma situation. On the one hand, they often have financial incentives leading to unethical behavior, at least in the short term. For example, Nike had a financial incentive to use child labor, since children receive very low wages. If companies manage to get away with unethical behavior, e.g. because the public is unaware of because they are able to mislead the public, they have an advantage because of financial benefits or simply because they do not need to change. On the other hand, when questionable behavior becomes public, the company incurs costs of changing, costs from lost sales due to the boycott, and the scandal may affect its reputation. As consumers may be torn between joining and not joining a boycott, companies may be torn between cost considerations and customers' ethical demands and the financial effects of both of them. Effectiveness of boycotts may depend on the direction that this struggle finally takes.

B.II Effectiveness of boycotts

Boycotts have a purpose and their effectiveness can be measured by the extent they achieve this objective. However, the purpose may not always be clearly defined in measurable terms. It is also difficult to judge about success if short and long-term outcomes of a boycott differ and if the effects of a boycott fade over time (Friedman 1991, p. 155).

By its underlying idea, a boycott is supposed to financially harm a company so that it aligns its behavior with boycotters' objectives. There is evidence of a negative financial impact of boycotts on firms. In the case of the multinational corporation that intended to close down two of its factories, sales in the brand produced at these sites dropped. Two weeks after the boycott was called, sales were down by 11 percent, and 4 month after the initiation of the boycott sales were still 4 percent below their pre-boycott value (Klein, Smith, and John 2004, p. 99).

Pruitt and Friedman (1986) also conducted a study of the financial impact of boycotts on boycotted firms. They found a strong negative impact since the market value of the majority of firms declined significantly. On average, during the day of the announcement of the boycott it declined by about 1 percent, and about 3.5 percent during the first two months of the boycott. This represents a financial loss of \$124 billion. This does yet not tell whether by the boycott the boycotters were able to attain their intended objectives (Pruitt and Friedman 1986, pp. 378–381). Negative stock price returns have also been reported for protests in general, independent of whether they lead to a boycott (King and Soule 2007, pp. 429–433). Garrett (1987, pp. 48–49) criticizes the assumption that economic pressure and boycott effectiveness are equal. However, he finds a positive relationship between economic or image pressure and the effectiveness of a boycott (1987, p. 51). A further study found about 27 percent of boycotts fully or partially successful in attaining their objectives (Friedman 1985, p. 108).

It may be counterintuitive, but a study found that the market value of companies actually increases on the day when the information about a boycott becomes public or when the threat of a boycott becomes public on average by 0.66 percent. The authors of the study also report increases in sales volume at Nike and at a brewing company of 40 and 8 percent (Koku, Akhigbe, and Springer 1997, p. 18). However, these increases are not independent of the company's reaction to boycotts, e.g. their alignment with boycotters' demands, pseudo-alignment or other damage control mechanisms.

The mechanisms between the dilemma of financial pressure, compliance, and boycott effectiveness are complex. There may not exist a "one-explains-all" conceptual model. However, it seems worth to develop a model that is able to relate financial and compliance aspects and the ethical outcomes of a boycott.

C A system dynamics model of the infant food controversy

The conceptual model suggested bases on a single boycott. The single case may not generate general applicability to all boycotts, but it allows for the close investigation of causal mechanisms. The detailed view generates a deeper understanding of the relation of the causal structure and the resulting behavior over time of a boycott.

The system dynamics methodology is particularly suited for the development and analysis of such a model. It is a modeling and simulation approach accounting for a system's complexity. It assumes that social systems are feedback systems in which historical accumulations are important for future behavior (Forrester 1968a, pp. 404–409; Forrester 1968b, ch. 1.2; Lane 2000, p. 4; Richardson 1999, pp. 296–317; Sterman 2002, p. 506) These models also serve as a laboratory for human action and system reaction.

The model developed here is based on data on the Nestlé infant formula controversy. In this controversy, Nestlé as the world's largest producer of breast milk substitutes (BMS) was boycotted because doctors, campaigning organizations, and the media accused the company of killing babies. Nestlé and other companies heavily marketed infant formula in developing countries particularly in Africa. For example, company staff dressed similar to nurses and these "milk nurses" gave mothers free samples of infant formula. After breast milk substitutes have been used for some time, it is very difficult for mothers to go back to breastfeeding and they are "addicted" to substitutes. While the product itself is not controversial, in combination with severe poverty, poor hygienic standards, and low educational levels, infants often received diluted and contaminated formula once they are out of hospital. Critics expressed that, as a result, these infants suffered from diarrhea and often also died (Derrick B. Jelliffe in a testimony to the UN Protein Advisory Group in 1969, cited in Newton 1999, p. 369; New Internationalist 1973). Information available about industry practices increased, and in 1977 a group of U.S. campaigners launched a boycott. The tension between the opposing groups was high as Nestlé did not accept the campaigners'

demands. It continued to defend the legitimacy of its behavior since it did not violate legislation in any developing country (Sethi 1994, pp. 20 and 70).

C.I Financial impact

Nestlé wanted to continue to market and sell breast milk substitutes due to the profits generated in this industry. Nestlé had a 40-percent market share for infant formula in developing countries. The company's *BMS sales* ranged at about \$ 460 million (in 1990), with a *profit margin* of as much as 50 percent (Sethi 1994, p. 129 and 133).¹ The relationships between the variables can also be seen in Figure 1. Marketing expenses have not been subtracted from profits since expenses are comparatively small.

The annual growth rate of profits for the respective period and region is expected to have been at about 7 to 8 percent (Sethi 1994, p. 134). This is one of the reasons why companies invest in marketing for BMS and why they do not want to abandon this market. However, for reasons of simplicity, the yearly growth is not included in the SD model. It is based on a constant level of *desired BMS profits* of \$ 230 million. The comparison of desired and actual profits tells about the *adequacy of BMS profits* which proportionally adjusts *BMS marketing* expenses upwards and downwards.

Marketing expenses translate into a *number of infants unnecessarily fed with BMS*. This conversion is expressed by marketing effectiveness, called *customer per expense* multiplier. For example, it informs about the costs for free samples that need to be given out in order to gain a customer. There does not exist any data, but it was assumed that it takes \$ 10 to gain a customer. This equals 3.2 kilos or about 12 daily rations of BMS that need to be given out.² This number is hypothetical and may be adapted to specific companies and circumstances. Changes do not affect the behavior pattern of the model. Together with the total *cost for feeding an infant*³ over the period of infancy, the *number of infants unnecessarily fed with BMS* determine *medically unnecessary BMS sales*. Total *BMS sales* also depend on *medically necessary BMS sales*. *Infants needing BMS* per year are 2 percent of *infants*, corrected by the period of infancy, i.e. the *time as infant*. The latter is set to 4 months because recommendations agree that babies should be exclusively breastfed at least during their first 4 months of life (Kramer and Kakuma 2002, p. 4; Unicef 1999).

¹ Numbers roughly match those found by Buffle who reports sales of \$ 600 million to \$ 2 billion for developing countries in the period from 1978 to 1983 (Buffle 1986, p. 441). Adjusted by market share this represents Nestlé BMS sales of \$ 240 million to \$ 800 million.

² $\$ 6 / (\text{profit margin} * \$ 6 \text{ per kilo}) = \$ 6 / (0.5 * \$ 6 \text{ per kilo}) = 2 \text{ kilo}$
Purchasing costs for BMS in India are \$ 6 per kilo (Dorosko and Rollins 2003). It can be assumed that they are roughly equal in developing countries.

³ *Costs for feeding an infant* are $\$ 6 \text{ per kilo of BMS} * 0.045 \text{ kilo per meal} * 6 \text{ meals per day} * 123 \text{ days} \approx \$ 200$
In Viet Nam, they were reported to be \$ 257 per year (Unicef 1999, p. 3).

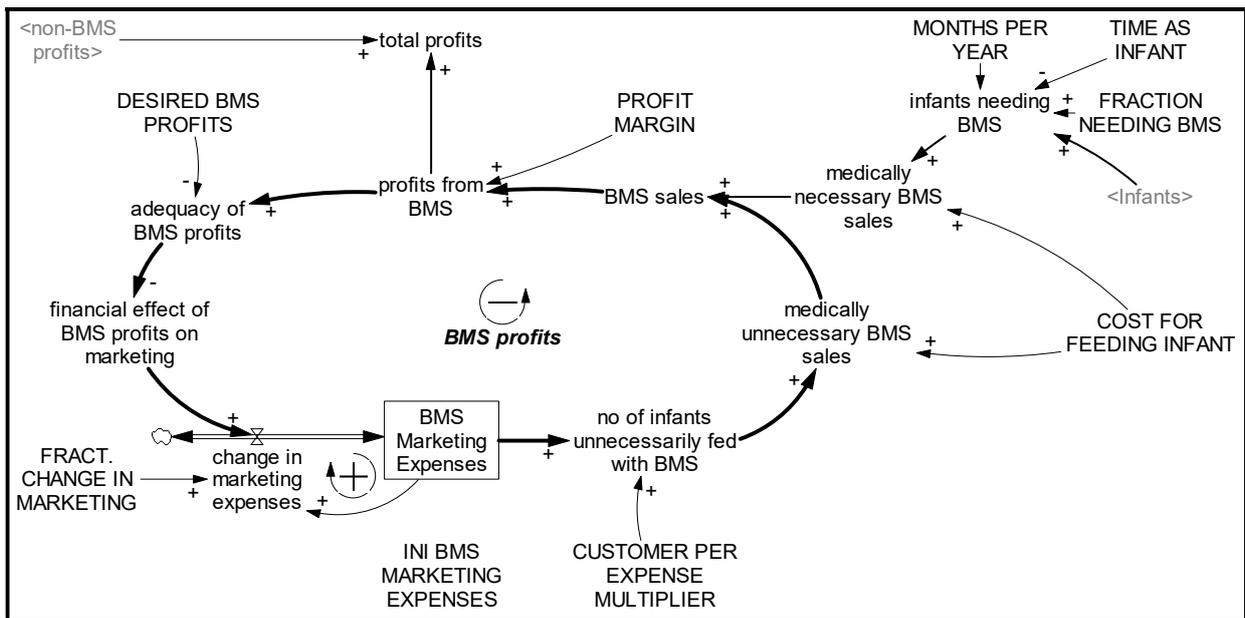


Figure 1: BMS profits

The full balancing feedback loop of *BMS profits* that has been described so far exhibits equilibrium behavior. *Profits from BMS* equal *desired BMS profits*, and BMS marketing expenses remain at \$ 12.7 million. However, the negative effect of the use of infant formula on the annual death rate needs to be taken into account.

C.II Infant deaths

In this paper, infants are defined as babies of 0 to 4 months of age because recommendations agree that babies of this age should be exclusively breastfed. The stock of infants relates to the target population of the Nestlé company, meaning it has been adjusted by its market share. The birth rate is calculated in equation (1) below. It is assumed that the population targeted is 50 percent of the African continent with a population of about 1 billion people. Half of the remaining people are women who give birth to about 4 children within 40 years. It also needs to be taken into consideration that among this population Nestlé has a market share of 40 percent that is assumed to be constant. The resulting birth rate is included into the model as a constant.

$$\begin{aligned}
 \text{birth rate [infants / month]} &= \\
 &\text{African population [1 billion people]} \\
 &* \text{fractional region targeted [0.5 dmnl]} \\
 &* \text{market share [0.4 dmnl]} \\
 &* \text{women per person [women / people]} \\
 &* \text{infants per woman [4 infants / woman]} \\
 &/ \text{live expectancy [40 years]} \\
 &/ \text{months per year [12 months / year]} \\
 &= 833,333 \text{ [infants / month]}
 \end{aligned}
 \tag{1}$$

Figure 2 reveals how the stock of infants is influenced by the *birth rate* and the *ablactation rate*. The latter captures the infants that cease to be dependent on breast milk or breast milk substitutes. Infants also decline by a *death rate* which is particularly high in the targeted region. The normal *fractional death rate* per year during the first four months of live in Africa can be assumed to be 2.6 percent per month (Unicef 2007, pp. 4, 6, and 150–153).⁴ This results in 10 percent deaths within the time as infant.

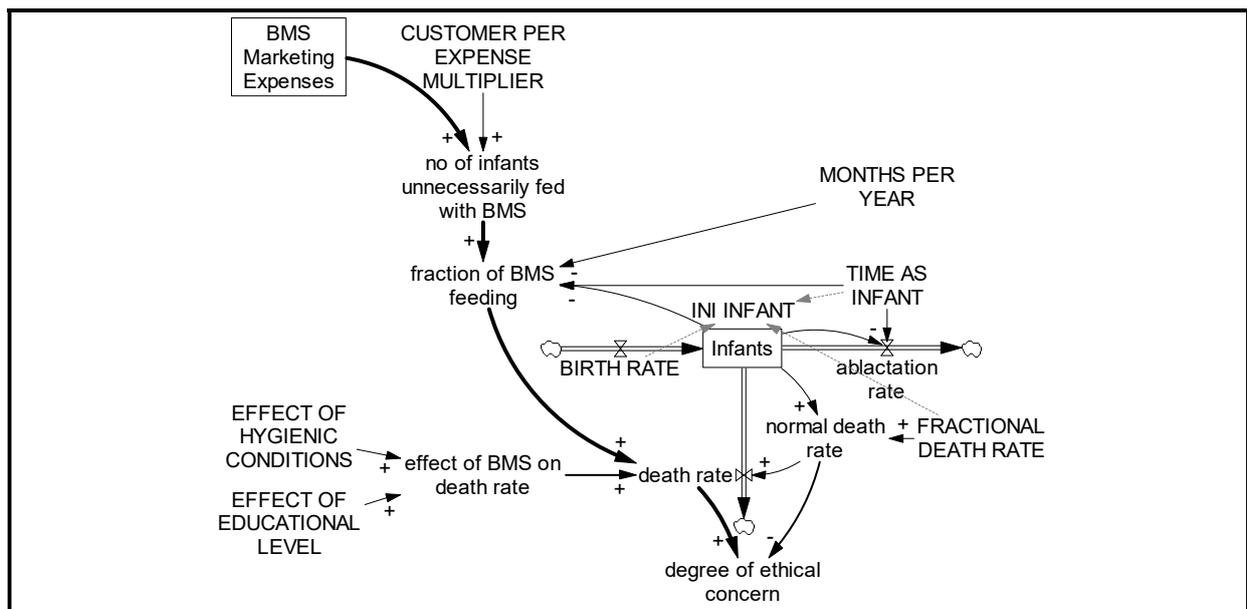


Figure 2: Infant deaths

The normal death rate is mediated by the effect of BMS feeding. It has been described before how *BMS marketing expenses* lead to a certain *number of infants unnecessarily fed with BMS*. This is again shown in Figure 2. This number in relation to the total number of *infants* gives the *fraction of (medically unnecessary) BMS feeding*. (The effect of medically necessary BMS feeding on the death rate is indirectly included in the normal *fractional death rate*.) By the *fraction of*

⁴ fractional death rate $\approx 1 - (1 - 20 \text{ percent death rate during first 5 years of life} * \text{fraction of 0.5 occurring during time as infant})^{(1 / \text{months per year})} = 1 - (1 - 0.2 * 0.5)^{(1 / 12)} \approx 0.026$.

BMS feeding, the *effect of BMS on the death rate* amplifies the latter rate. The strength of this effect is set by hygienic conditions and the education level. In the view of Jelliffe and Jelliffe (1978, pp. 284–285), the degree of formula contamination is much greater in areas with a poor level of hygienic conditions and with a low educational level because illiteracy prevents mothers from reading preparation instructions for formula. The exposure to contaminated meals has a negative effect on infant health and increases infants' death rate. The relative death rate in comparison with the normal one serves as an indicator for the severity of Nestlé's misconduct. It defines the *degree of ethical concern* with the company's behavior. This degree of ethical concern initially increases in a linear way before it softly touches its upper limit.

C.III Awareness and media attention

The degree of ethical concern triggers campaigns, media attention, makes the general public aware, and finally leads to the boycott. In the Nestlé case, the first people aware of the consequences of the company's behavior were doctors and campaigning groups. As the upper left part of Figure 3 reveals, these groups engaged in *campaigning* events such as the Boston Nestea Party when campaigners dumped the company's products into the sea (Sethi 1994, p. 72). Their intensive lobbying also resulted in a hearing in front of U.S Senator Edward Kennedy in 1978. Due to the obvious degree of ethical concern, the events raised media attention (i.e. the *extent of news coverage*), and the latter increased public *awareness from news coverage* (Sethi, 1994, 90). Awareness and interest in the issue develop by a diffusion pattern. The *number of people interested* increases by those attracted from news coverage and from word of mouth, but it also decreases by a *losing interest rate* as people turn towards other issues. This structure generates a peak, but then a decrease in in the *number of people interested* in Nestlé's behavior. This generally conforms with observed behavior.

Additionally, the *extent of news coverage* also depends on past news. There were two waves of the boycott, and the database LexisNexis lists 26 Associated Press articles about the first wave of the Nestlé boycott. During the second wave, only 4 articles appeared although campaigning was still high. Figure 3 explains this by a *fractional loss of topicality* that drains *topicality* with every news report. When topicality decreases, campaigning events do not translate into news reports any more since the topic has been extensively covered already. Media attention affects people's awareness and interest. However, the *number of people interested* does not directly depend on *news coverage* since there is a delay between changes in the news and people's behavior.

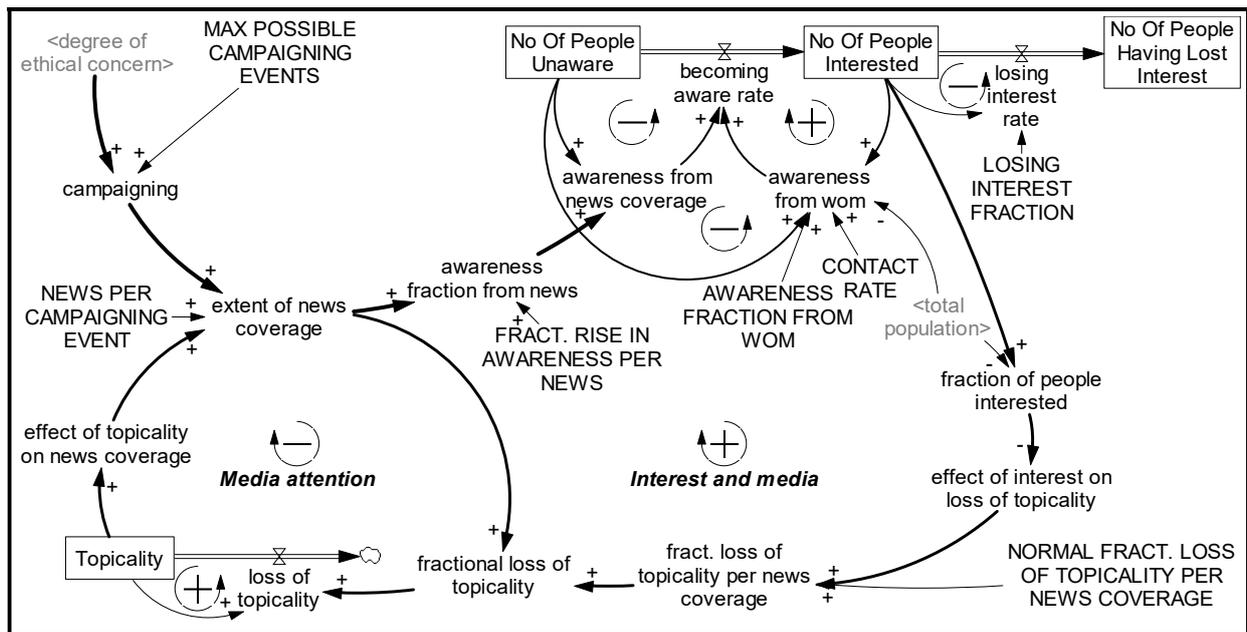


Figure 3: Media attention and awareness

The extent to which past news drain topicality also depends on the *number of people currently interested* in the issue. As Figure 3 shows, there is an *effect of interest on the loss of topicality*. This effect decreases when the *fraction of people interested* is high. Hence, the *fractional loss of topicality* is lower. This effect creates the reinforcing mechanism *interest and media* by which the drain of topicality accelerates and decelerates depending on the number of people interested in the issue.

C.IV Boycotters and non-BMS profits

The Nestlé controversy shows that campaigning groups may make consumers aware of ethical misconduct, leading to an incentive to boycott the firm. Awareness of the public of a company's behavior is a necessary factor for a consumer boycott to take place (Garrett 1987, p. 48). Thus the number of people interested in the issue increases the *number of boycotters*, as indicated in Figure 4. The *fraction of boycotters among people interested* was set to 0.3, as reported for the Nestlé boycott (INFACT - Infant Feeding Action Coalition 1982, p. 2, cited in Chetley 1986, p. 54). The *fraction of boycotters* proportionally reduces *non-BMS profits* as well as their perceived *adequacy*. This dissatisfaction with profitability can trigger a rethinking in the organization. By this financial effect, the company is drawn to reduce its marketing and comply with boycotters' demands. It also needs to be noted that this financial effect derives from non-BMS profits. This is a peculiarity to the Nestlé corporation as non-BMS products account for 98 percent of sales (Sethi 1994, p.). Therefore, the financial effect of BMS-profits on marketing is weighted to be only about 2 percent of that of the boycott. The financial effect closes a balancing feedback loop by which marketing and infant deaths adapt to ethical demands via campaigning, media attention, and boycotting.

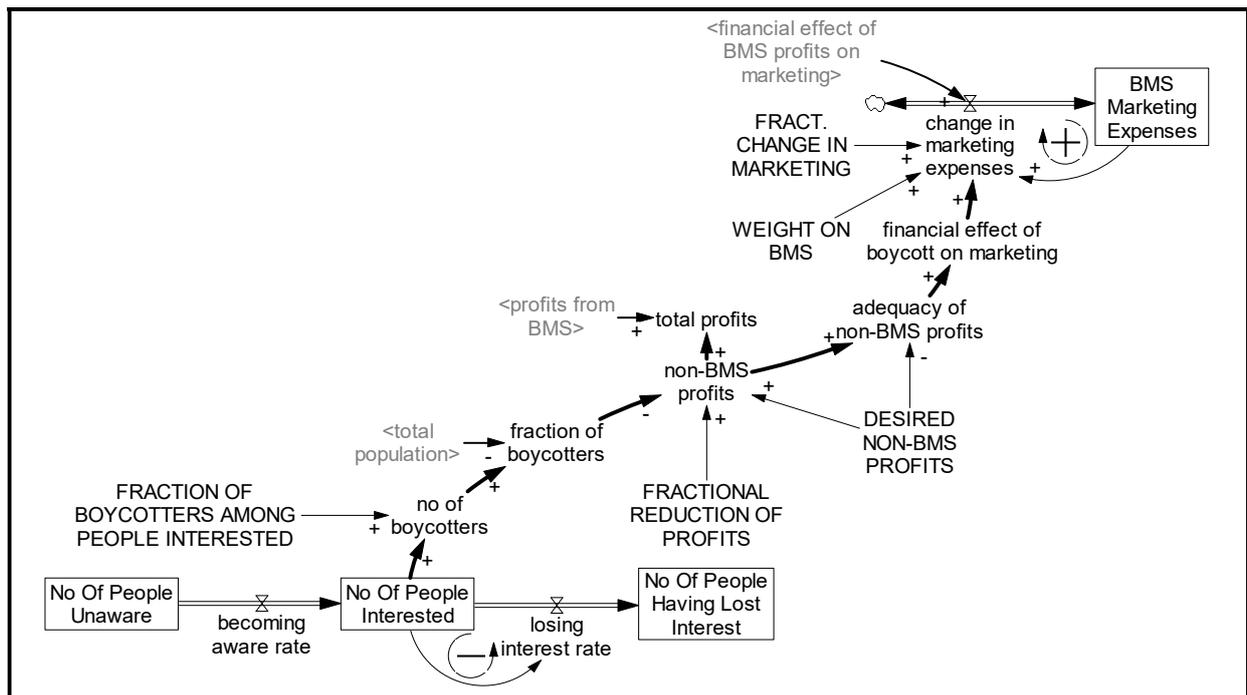


Figure 4: Boycotters and non-BMS profits

Nestlé did not publish information about the costs incurred by the boycott. Yet, a Nestlé manager admitted that the boycott hurt the company (reported in a newsletter by Infact, cited in Chetley 1986, p. 129). Buffle (1986, p. 13) estimates lost sales of \$ 770 million to \$ 1540 million. Additionally, the company may have spent \$ 20 million to fight the issue and between \$ 280 million and \$ 560 million to erase its after-effects. These include the company's image, employee turnover, lost morale, and the costs of attributing time to it (Chetley 1986, p. 55; Post 1985, p. 124; Smith 1990, 250). A possible positive financial effect of the boycott is therefore outside the boundary of this investigation. Therefore, possible positive effects of the company's presence in the media are not considered either. There are many specifications to the Nestlé boycott that have been left out. The purpose of this SD model is rather to be conceptual and to explain the general relationship of financial incentives, ethical concern, and boycotting behavior.

D Policy analysis

D.1 Base run behavior

The SD model has been simulated. Its time frame covers the years from 1976 to 1996 and thus includes the years of the public discussion of the controversy and the many years after it when campaigning still went on. The model's base run behavior is shown in Figure 5. As lines 1, 2 and 3 demonstrate, *BMS marketing expenses* start out high, leading to a high *degree of ethical concern* and an equally high extent of *campaigning*. Due to the falling topicality of the topic in the media, news coverage (line 4) declines over time, in congruence with data available. It can

also be seen how the boycott (line 5) develops quickly, reaches its peak between 1977 and 1978, but then loses momentum. People lose interest or the willingness to actively engage in the issue.

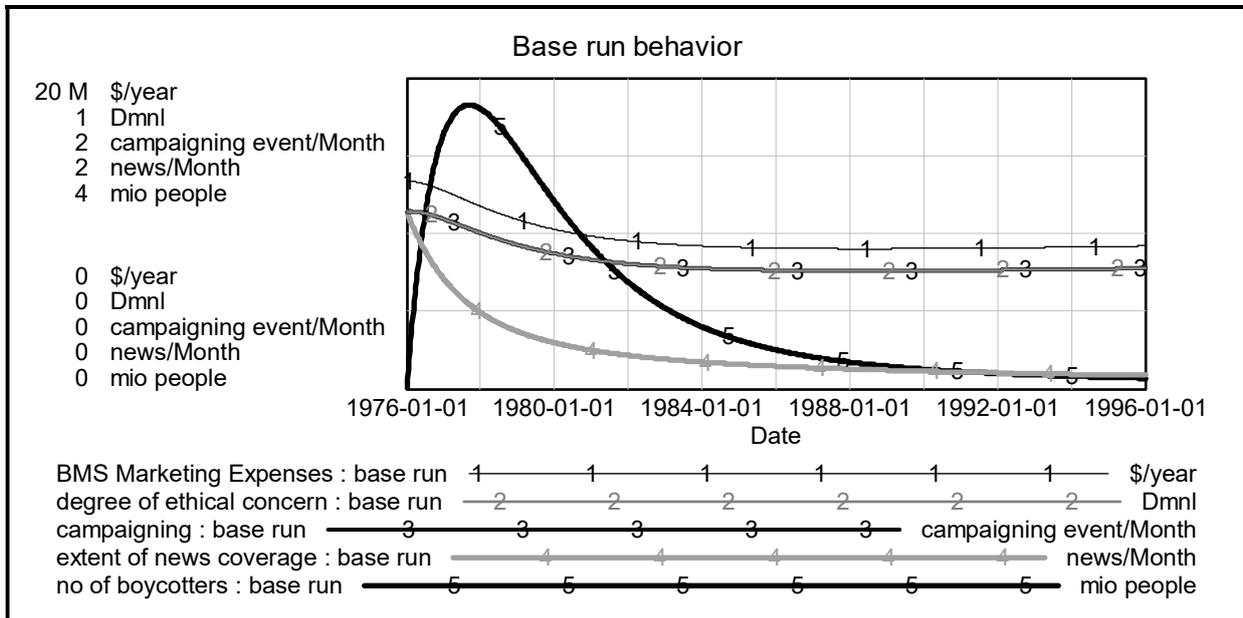


Figure 5: Base run behavior

Quite remarkably, the boycott takes place, but the situation for infants does not change much. The boycott leads to a small decrease in marketing, but once it loses momentum, the marketing activities even slightly increase again. This explains why Friedman found only about 27 percent of the boycotts he analyzed to be fully or partially successful (Friedman 1985, p. 108).

D.II Weighting of boycott vs. BMS profits

It has been stated that infant formula accounts for only 2 percent of the company’s turnover. It is hence interesting to see whether a boycott has a different effect if it concerns a greater or major part of a firm’s products. In the base run, the effect of the boycott reduced the amount of money spent on marketing to about two thirds of the original value for a considerable amount of time. When the proportion of BMS was higher in the respective company, meaning if the boycott targeted a product that it makes a considerable proportion of its money from, the effect of the boycott is much smaller. Figure 6 indicates this. With a proportion of sales, i.e. a weight on BMS of 0.5, it is hardly possible to change the company’s behavior and marketing expenses quickly return to their equilibrium value. This is because profits from BMS are so important that the company would make large losses if it refrained from that product.

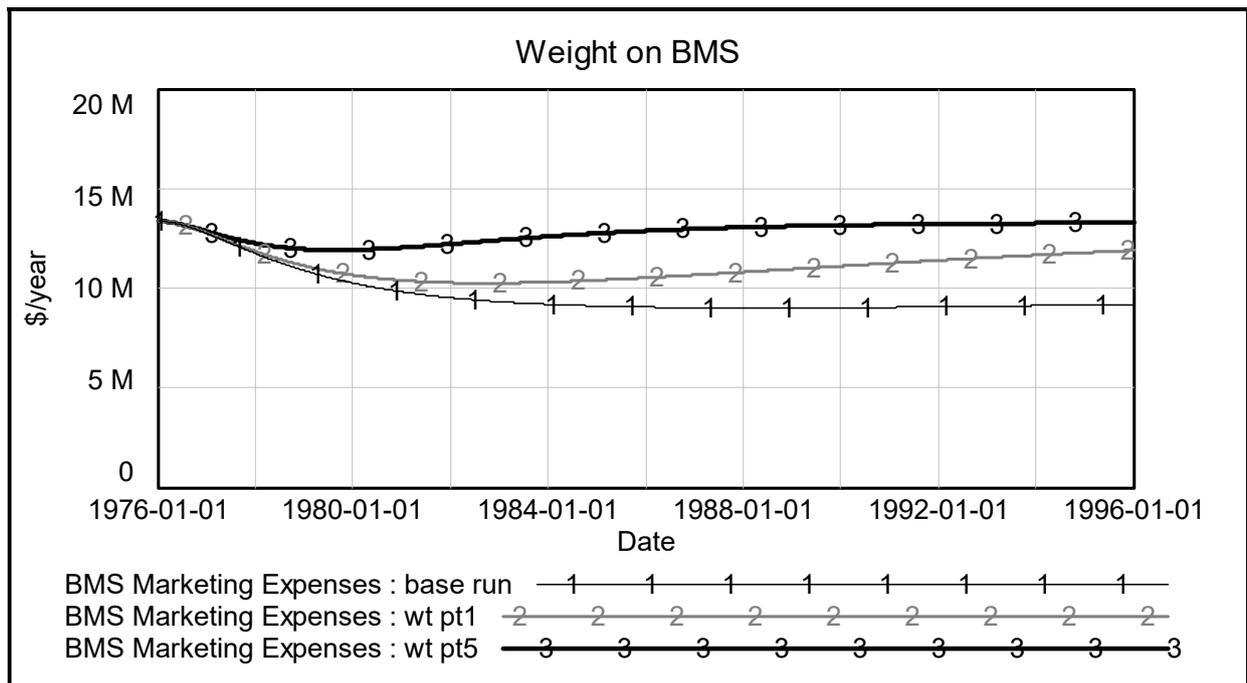


Figure 6: Weight of BMS

Marketing expenses increase back to their original level since the boycott loses its momentum and dissolves. The interest of the media in the topic decreases, and fewer and fewer people are interested in actively boycotting the company. However, in the base case, campaigners are still dissatisfied due to a high degree of ethical concern. The controversy resolves on the surface only. As a theoretical possibility, a decrease in people's demands would fully resolve the conflict. This is yet very unlikely since demands on the ethical behavior on companies are rather increasing. As a second possibility to fully resolve the controversy, the company needed to abandon its motivation to make profits from infant formula. The simulation runs show that this is very unlikely if the product has great importance for the company. Additionally, if incentives are set in a different way, the company may be forced to comply with people's ethical demands. The effects of such a change of incentives will be analyzed next.

D.III Compliance through codes and laws

In the previous simulations the financial effect of the boycott alone did not cause a sustainable decrease in marketing and improvement in the children's situation. In order for campaigners to reach their objectives, they also have the possibility to attend to the environment that Nestlé and other companies compete in. This strategy may be more successful at leveraging change. While it is unlikely that campaigners succeed at solving the problems of developing countries, they can influence the extent of marketing that is allowed in these countries. The implementation of codes of conduct and of specific laws can and did reduce the extent of marketing there. Due to the severity of the situation and the attention that the issue got, the World Health Organization (WHO) started to draft a code of conduct that was supposed to serve as guideline for the whole infant

formula industry. The International Code of Marketing of Breast-milk Substitutes limits the kinds of marketing practices allowed and thus limits the *marketing allowed by code or law*. For example, it prohibits the use of “milk nurses“. As Figure 7 shows, the code also served as a basis for legal changes in many countries.

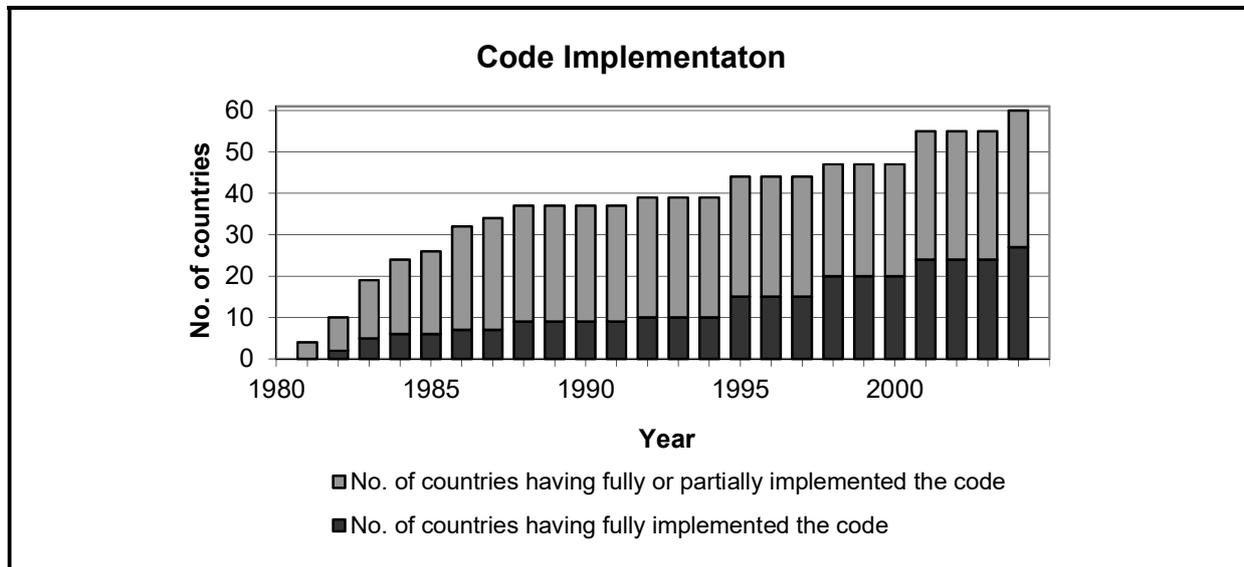


Figure 7: Implementation of code into law (Baby Milk Action no date)

Sethi (1994, pp. 325, 330, and 332) makes aware that it was implemented slowly and often partially only. Additionally, WHO and implementing countries often did not sufficiently monitor how narrowly companies follow suit. However, despite these problems, the code and the following legal changes reduced the *marketing allowed by code or law* to a considerable extent. The causal mechanisms that allowed for this can be seen in Figure 8. *Campaigning* rather than withdrawn purchases from the boycott has a negative relative effect on the amount of marketing that is allowed. This effect then fractionally reduces *marketing allowed*. The *fractional reduction of marketing allowed* captures the pace of implementing codes and laws as well as their effectiveness through surveillance and monitoring. The comparison of *marketing allowed* with actual *BMS marketing expenses* affects the company’s marketing expenses in addition to the *financial effect of BMS profits* and the *financial effect of the boycott*.

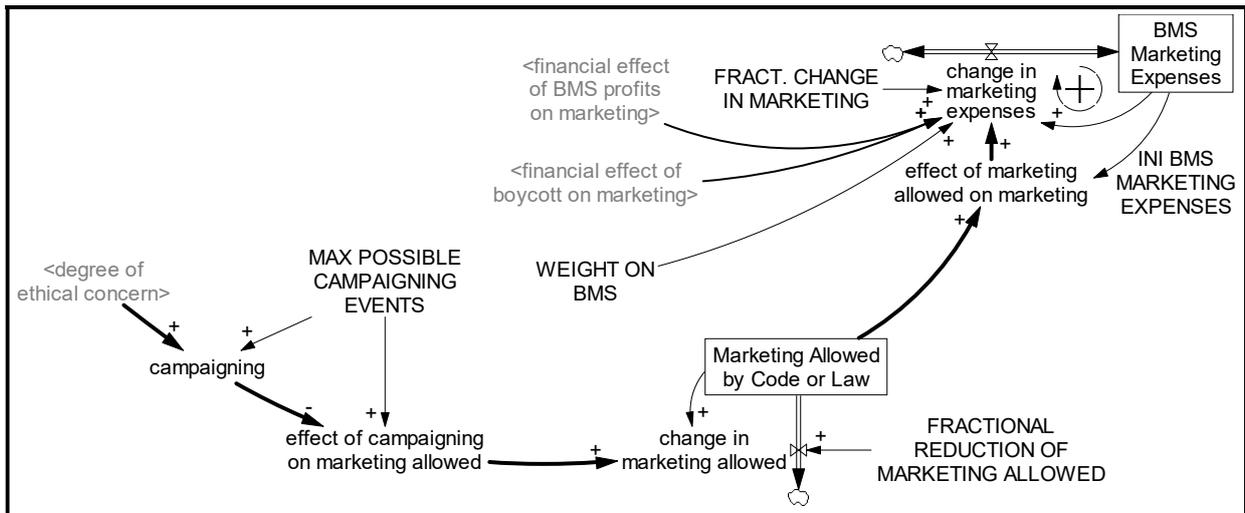


Figure 8: Codes and laws

The reduction of marketing allowed creates a balancing feedback effect on the system. Figure 9 shows that the extent of marketing obviously depends on the pace of implementation and the quality of monitoring of the code. I.e. it depends on the *fractional reduction of marketing allowed*. The simulation run demonstrates the effectiveness of the implementation of these regulatory elements. It also becomes obvious that their implementation often has a much greater positive effect than the boycott alone.

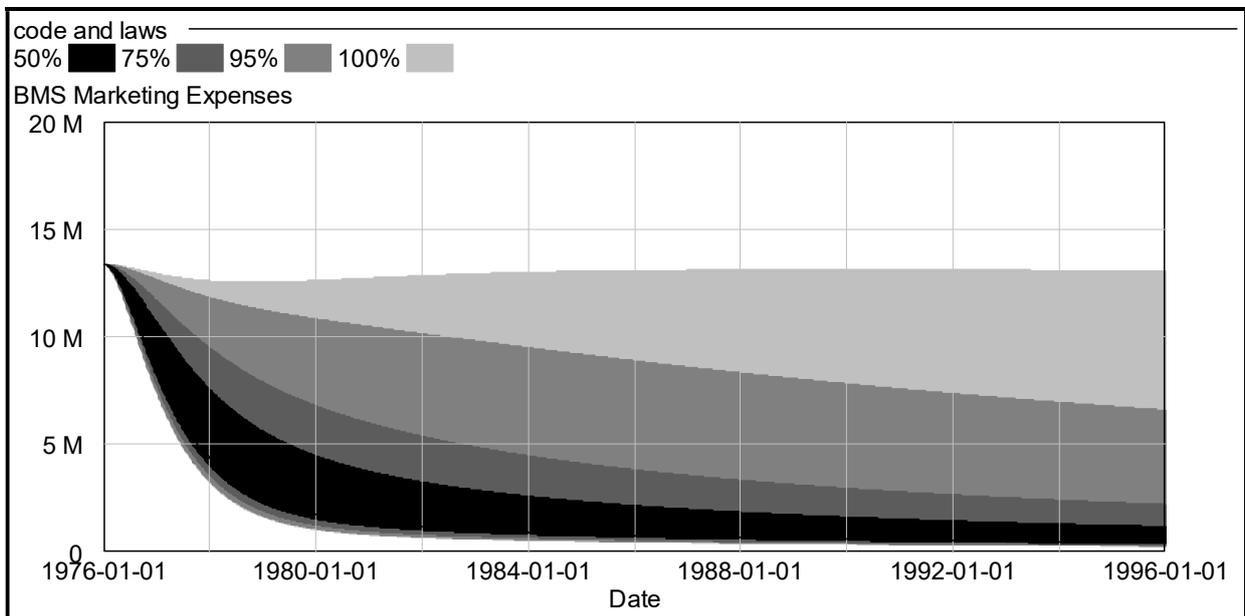


Figure 9: Possible effect of codes and laws

By fostering the introduction of regulatory elements, those who have a high degree of ethical concern are able to successfully change the environment to their advantage. Then, although Nestlé or another company still do not deviate from their objective to be as profitable as possible,

they move a step closer to what campaigners or the general public desire. Devoting energy to the implementation of codes and laws is a successful lever of change. It is a more sustainable strategy than the boycott alone to enhance companies' ethical behavior. By its effect on regulation, campaigning changed the rules of the game.

E Conclusion

Boycotts often developed out of dissatisfaction of campaigning organizations and the general public with the ethical dimension of corporate conduct. Boycotts are supposed to put firms in a financial dilemma between profits from the continuation of the old strategy on the one hand and the costs of not complying with ethical demands on the other hand. In many cases, however, boycotts do not reach the intended objectives (Friedman 1985, p. 108). In order to gain insight about the mechanism of the dilemma and the effectiveness of boycotts, this paper presented a system dynamics model describing mechanisms of a boycott. It concentrated on a particular case, i.e. Nestlé's behavior in relation to the infant formula controversy.

The construction of a causal model, its quantification and subsequent simulation revealed that boycotts have some success if they target products that are quite far from the company's core, meaning the costs for the company of abandoning profits from this area are small. It may seem counterintuitive that—in particular if the boycott targets core organizational elements—the positive ethical effects of a boycott are short-lived. This is because of the ephemeral nature of a boycott. A boycott wave accelerates and fades.

The analysis also revealed that campaigners can be more successful by devoting additional energy to regulatory changes such as codes of conduct and laws. These regulatory changes have longer-term effects. They reduce the extent of the dilemma situation that the focal organization is in. At the same time they reduce the freedom this organization has. Companies may also neglect these codes and laws as at least their financial executives do not always pay sufficient attention to regulatory bodies in their compliance with codes of ethics (Stevens et al. 2005, pp. 191–192). If companies are monitored, however, it proved a valuable strategy for campaigners not only to focus on a boycott, but work into the direction of regulatory changes as well.

The SD model that has been used for this analysis is rather small and conceptual. Therefore, it excludes several phenomena that could be observed in reality. For example, the model does not allow for a second wave of the Nestlé boycott which took place. In order to make the model more realistic and better suited for the Nestlé scandal, this could be included by allowing people who have lost interest to return to a population of potential boycotters. Additionally, the primary focus was on causal relationships rather than the effects of delays. A more detailed focus on information and response delays in the development of an ethical controversy would also enhance the model's validity.

Future research may take these suggestions into action. It may additionally relate this work with the growing amount of studies concerning the use of certificates to inform about and monitor a company's behavior (Renard 2005; Taylor 2005). As long as the implementation of a code is voluntary and implementation is monitored, the use of a code of conduct and of certificates has many similarities.

Despite these limitations, modeling and simulation revealed some general mechanisms between customers' ethical demands and the financial interests of a company. It also showed how the demand for ethical behavior can interfere with the objective to make profits. The analysis of the system dynamics model also pointed to the effectiveness of codes of behavior and of regulation in the area of business ethics.

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Appendix

- (01) ab lactation rate=
 Infants / TIME AS INFANT
 Units: infant/Month
- (02) adequacy of BMS profits=
 profits from BMS / DESIRED BMS PROFITS
 Units: Dmnl
- (03) "adequacy of non-BMS profits"=
 "non-BMS profits" / "DESIRED NON-BMS PROFITS"
 Units: Dmnl
- (04) awareness fraction from news=
 extent of news coverage * "FRACT. RISE IN AWARENESS PER NEWS"
 Units: 1/Month
- (05) AWARENESS FRACTION FROM WOM=
 1e-007
 Units: mio people/contact
- (06) awareness from news coverage=
 No Of People Unaware * awareness fraction from news
 Units: mio people/Month
- (07) awareness from wom=
 No Of People Unaware * No Of People Interested * CONTACT RATE * AWARENESS
 FRACTION FROM WOM
 / total population
 Units: mio people/Month
- (08) becoming aware rate=
 awareness from news coverage + awareness from wom
 Units: mio people/Month
- (09) BIRTH RATE=
 833333
 Units: infant/Month
- (10) BMS Marketing Expenses=
 INTEG (change in marketing expenses, INI BMS MARKETING EXPENSES)
 Units: \$/year

- (11) BMS sales=
 medically unnecessary BMS sales + medically necessary BMS sales
 Units: \$/year
 \$ 460 million in third world in 1990 (Sethi 1994, p. 133). \$ 400
 to \$ 600 worldwide (Sethi 1994, p. 138).
- (12) campaigning=
 degree of ethical concern * MAX POSSIBLE CAMPAIGNING EVENTS
 Units: campaigning event/Month
- (13) change in marketing allowed=
 effect of campaigning on marketing allowed * Marketing Allowed by Code or Law
 * FRACTIONAL REDUCTION OF MARKETING ALLOWED
 Units: \$/(year*Month)
- (14) change in marketing expenses=
 (BMS Marketing Expenses * "FRACT. CHANGE IN MARKETING")
 * (financial effect of boycott on marketing
 + financial effect of BMS profits on marketing
 * WEIGHT ON BMS + effect of marketing allowed on marketing)
 Units: \$/year/Month
- (15) CONTACT RATE=
 200000
 Units: contact/mio people/Month
- (16) COST FOR FEEDING INFANT=
 200
 Units: \$/infant
 6\$ per kilo of BMS * 0.045 kilo per meal * 6 meals per day * 123
 days = 200\$
- (17) CUSTOMER PER EXPENSE MULTIPLIER=
 0.1
 Units: infant/\$
 It is assumed that it costs \$ 10 to win a customer.
- (18) death rate=
 normal death rate * (1 - fraction of BMS feeding + effect of BMS on death rate
 * fraction of BMS feeding)
 Units: infant/Month
- (19) degree of ethical concern=
 WITH LOOKUP (death rate / normal death rate,
 ((1,0)-(1.125,1)],(1,0),(1.025,0.22),(1.05,0.46),(1.075,0.7),(1.1,0.92),(1.125,1)))
 Units: Dmnl

- (20) DESIRED BMS PROFITS=
2.3e+008
Units: \$/year
- (21) "DESIRED NON-BMS PROFITS"=
1e+009
Units: \$/year
- (22) effect of BMS on death rate=
EFFECT OF EDUCATIONAL LEVEL * EFFECT OF HYGIENIC CONDITIONS
Units: Dmnl
- (23) effect of campaigning on marketing allowed=
- campaigning / MAX POSSIBLE CAMPAIGNING EVENTS
Units: Dmnl
- (24) EFFECT OF EDUCATIONAL LEVEL=
1.2
Units: Dmnl
- (25) EFFECT OF HYGIENIC CONDITIONS=
1.25
Units: Dmnl
20 % of infant deaths are caused by diarrhea.
- (26) effect of interest on loss of topicality=
WITH LOOKUP (fraction of people interested,
([(0,0)-(1,1)],(0,1),(0.1,0.76),(0.2,0.59),(0.3,0.45),(0.4,0.35),(0.5,0.27),(0.7,0.18),(1,0.1)))
Units: Dmnl
- (27) effect of marketing allowed on marketing=
(Marketing Allowed by Code or Law / BMS Marketing Expenses - 1)
* SWITCH FOR CODES AND LAWS
Units: Dmnl
- (28) effect of topicality on news coverage= WITH LOOKUP (
Topicality,([(0,0)-(1,1)],(0,0),(1,1)))
Units: Dmnl
- (29) extent of news coverage=
campaigning * NEWS PER CAMPAIGNING EVENT
* effect of topicality on news coverage
Units: news/Month
- (30) FINAL TIME = 240
Units: Month
The final time for the simulation.

- (31) financial effect of BMS profits on marketing=
1 - adequacy of BMS profits
Units: Dmnl
- (32) financial effect of boycott on marketing=
"adequacy of non-BMS profits" - 1
Units: Dmnl
- (33) "FRACT. CHANGE IN MARKETING"=
0.1
Units: 1/Month
- (34) "fract. loss of topicality per news coverage"=
"NORMAL FRACT. LOSS OF TOPICALITY PER NEWS COVERAGE"
* effect of interest on loss of topicality
Units: 1/news
- (35) "FRACT. RISE IN AWARENESS PER NEWS"=
0.03
Units: 1/news
- (36) FRACTION NEEDING BMS=
0.01
Units: Dmnl
- (37) fraction of BMS feeding=
no of infants unnecessarily fed with BMS / Infants * TIME AS INFANT / MONTHS
PER YEAR
Units: Dmnl
- (38) fraction of boycotters=
no of boycotters / total population
Units: Dmnl
- (39) FRACTION OF BOYCOTTERS AMONG PEOPLE INTERESTED=
0.3
Units: Dmnl
- (40) FRACTIONAL DEATH RATE=
0.026
Units: 1/Month
fractional death rate = $1 - (\text{fractional survival rate})^{(1/12)} = 1 - (0.8 * 0.5)^{(1/12)} = 0.026\%$. 50 % of children that die within their first 5 years of life already die within the time of infancy. The number of 50 % is an estimation since 40 % of the children that die do so within the first month and 60 % within the first year. (Unicef: The state of the world's children 2008. Child survival, pp. 4–6)

- (41) fraction of people interested=
 $\text{No Of People Interested} / \text{total population}$
 Units: Dmnl
- (42) fractional loss of topicality=
 $\text{extent of news coverage} * \text{"fract. loss of topicality per news coverage"}$
 Units: 1/Month
- (43) FRACTIONAL REDUCTION OF MARKETING ALLOWED=
 0.2
 Units: 1/Month
- (44) FRACTIONAL REDUCTION OF PROFITS=
 1
 Units: Dmnl
- (45) Infants=
 $\text{INTEG}(\text{BIRTH RATE} - \text{ablactation rate} - \text{death rate}, \text{INI INFANT})$
 Units: infant
- (46) infants needing BMS=
 $\text{FRACTION NEEDING BMS} * \text{Infants} / \text{TIME AS INFANT} * \text{MONTHS PER YEAR}$
 Units: infant/year
- (47) INI BMS MARKETING EXPENSES=
 $2.20922e+007$
 Units: \$/year
- (48) INI INFANT=
 $\text{BIRTH RATE} / (1 / \text{TIME AS INFANT} + \text{FRACTIONAL DEATH RATE})$
 Units: infant
- (49) INITIAL TIME = 0
 Units: Month
 The initial time for the simulation.
- (50) LOSING INTEREST FRACTION=
 0.05
 Units: 1/Month
- (51) losing interest rate=
 $\text{No Of People Interested} * \text{LOSING INTEREST FRACTION}$
 Units: mio people/Month
- (52) loss of topicality=
 $\text{Topicality} * \text{fractional loss of topicality}$
 Units: topicality unit/Month

- (53) Marketing Allowed by Code or Law=
INTEG (change in marketing allowed, INI BMS MARKETING EXPENSES)
Units: \$/year
- (54) MAX POSSIBLE CAMPAIGNING EVENTS=
2
Units: campaigning event/Month
- (55) medically necessary BMS sales=
infants needing BMS * COST FOR FEEDING INFANT
Units: \$/year
About 1 percent of mothers cannot breastfeed.
- (56) medically unnecessary BMS sales=
no of infants unnecessarily fed with BMS * COST FOR FEEDING INFANT
Units: \$/year
- (57) MONTHS PER YEAR=
12
Units: Month/year
- (58) NEWS PER CAMPAIGNING EVENT=
1
Units: news/campaigning event
- (59) no of boycotters=
FRACTION OF BOYCOTTERS AMONG PEOPLE INTERESTED
* No Of People Interested
Units: mio people
- (60) no of infants unnecessarily fed with BMS=
BMS Marketing Expenses * CUSTOMER PER EXPENSE MULTIPLIER
Units: infant/year
- (61) No Of People Having Lost Interest=
INTEG (losing interest rate, 1)
Units: mio people
- (62) No Of People Interested=
INTEG (becoming aware rate-losing interest rate, 0.01)
Units: mio people
- (63) No Of People Unaware=
INTEG (-becoming aware rate, 49,99)
Units: mio people

- (64) "non-BMS profits"=
 (1 - fraction of boycotters * FRACTIONAL REDUCTION OF PROFITS)
 * "DESIRED NON-BMS PROFITS"
 Units: \$/year
- (65) normal death rate=
 Infants * FRACTIONAL DEATH RATE
 Units: infant/Month
- (66) "NORMAL FRACT. LOSS OF TOPICALITY PER NEWS COVERAGE"=
 0.05
 Units: 1/news
- (67) PROFIT MARGIN=
 0.5
 Units: Dmnl
 Sethi (1994), p. 129.
- (68) profits from BMS=
 BMS sales * PROFIT MARGIN
 Units: \$/year
- (69) SAVEPER = 0.25
 Units: Month [0,?]
 The frequency with which output is stored.
- (70) SWITCH FOR CODES AND LAWS=
 0
 Units: Dmnl
- (71) TIME AS INFANT=
 4
 Units: Month
- (72) TIME STEP = 0.25
 Units: Month [0,?]
 The time step for the simulation.
- (73) Topicality=
 INTEG (-loss of topicality, 1)
 Units: topicality unit
- (74) total population=
 No Of People Unaware + No Of People Interested + No Of People Having Lost Interest
 Units: mio people

(75) total profits=
profits from BMS + "non-BMS profits"
Units: \$/year

(76) WEIGHT ON BMS=
0.02
Units: Dmnl