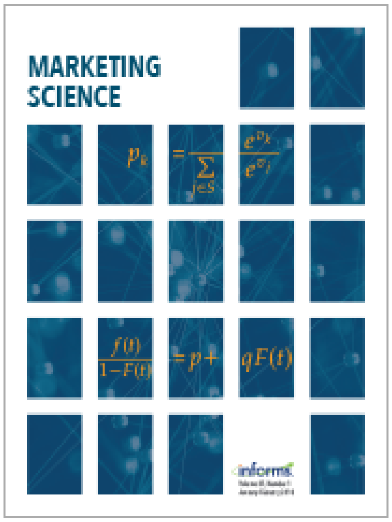

Marketing Science

Publication details, including instructions for authors and subscription information:
http://pubsonline.informs.org

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MARKETING SCIENCE
Vol. 32, No. 3, May–June 2013, pp. 393–410
ISSN 0732-2399 (print) | ISSN 1526-548X (online)

http://dx.doi.org/10.1287/mksc.2013.0776

Differentiate or Imitate? The Role of Context-Dependent Preferences

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Laboratory and field experiments show that when choosing among a set of objects, consumers could be subjected to context-dependent preferences and evaluate options by considering both the absolute utilities and their relative standing in the choice set. Using this premise we construct a game-theoretic model of competition between two firms and investigate how a firm's decision to differentiate or imitate is affected when consumers' preferences are context-dependent. We consider two horizontally differentiated firms where some consumers own the product of one firm and the rest own the other firm's product. One firm upgrades its existing product by adding a new feature. In the absence of any cost or capability constraints, to protect its competitive position, the other firm would prefer to upgrade its product by adding a differentiated new feature. We show that if consumers' preferences are context-dependent and the new feature is of an incremental type, the second mover prefers to imitate the first mover by adding the same feature even when there is no cost disadvantage to differentiate itself. This happens because context-dependent preferences cause consumers to dislike brands that are very differentiated from one another. Thus, if the second mover mimics the first mover, both firms can charge higher prices for their upgraded products (i.e., imitation leads to higher prices). This outcome, in turn, leads the first mover to pick a new feature such that it would induce the second mover to imitate. Therefore, our analysis shows that the need for context management leads not just to imitation but also to accommodating imitation.

Key words: context-dependent preferences; imitation; competition; new product entry
History: Received: February 19, 2012; accepted: January 2, 2013; Preyas Desai served as the editor-in-chief and Anthony Dukes served as associate editor for this article. Published online in *Articles in Advance* March 21, 2013.

1. Introduction

Positioning is an important strategic decision for a marketing manager—positioning a product attractively in the value space relative to its competitors is key for its long-term success. The standard marketing mantra or conventional wisdom is that a firm should differentiate its product from its competitors' products. The underpinning for this prescription comes from the standard analysis of consumer behavior where consumers choose a brand in the marketplace that yields them the greatest utility. Firms differentiate from one another, exploiting the preference heterogeneity in the marketplace and avoiding ruinous price competition that could occur if a lack of sufficient differentiation exists. The microeconomic model of consumer behavior on which this prescription is founded is based on well-established preferences. These are a set of regularity conditions that govern preference orderings among objects of choice that lead to a utility function that a consumer maximizes subject to a budget constraint. In the economic model, the preference ordering among a set of objects is invariant with respect to the larger context of what else exists in the consumer's choice set. However, based on their experiments, consumer behavioral researchers have documented that when choosing among a set of objects, consumers evaluate options by considering both the absolute utilities and their relative standing in the choice set, and this process leads to context-dependent preferences (Huber et al. 1982, Simonson and Tversky 1992, Tversky and Simonson 1993, Bhargava et al. 2000, Drolet et al. 2000). As the preference structure changes from context to context, choice reversals can happen across different situations. It has been argued that consumers compare each option with a reference point that is endogenous to the choice set (Kivetz et al. 2004a, b), and in comparative valuation, losses loom larger than gains. The reference dependence and loss aversion together cause choice reversals across contexts (i.e., context-dependent preferences). There is a great deal of both experimental and field evidence for reference dependence and loss aversion. Ho et al. (2006) and DellaVigna (2009) provide an extensive list of experimental and field work showing reference dependence and loss aversion in various types of economic domains and choices (see Table A.2 of Ho et al. 2006 and pp. 324–336 of DellaVigna 2009).

In addition, Dhar and Zhu (2006) show reference dependence and loss aversion in people's stock market trading behavior. Narasimhan et al. (2005) and Ho et al. (2006) suggest that modelers should integrate reference dependence and loss aversion in their models and investigate how firms' behavior changes when they face a group of consumers who have reference-dependent preferences.

Given this parallel development in the consumer behavior literature, we revisit the issue of whether a firm should strive to differentiate its product or mimic its competitor. We pursue this by building a model that incorporates context dependence and explore the differences in the implication for firms that are trying to catch up with their rivals and stay competitive. We seek to understand whether the need for context management encourages firms to be more or less likely to imitate. To accomplish our goal, we construct a model with two horizontally differentiated firms (firm A and firm B). Firm A plans to upgrade its current product by adding a new feature. Firm B is aware of firm A's plan, and to retain its competitive position, it can respond to this either by imitating firm A (i.e., adding the same new feature to its own basic product) or by adding a different new feature that will be at least as equally liked as firm A's new feature. We rule out any cost differences in pursuing the two strategies. In the absence of context-dependent preferences, firm B never prefers to imitate. However, for the same parameter values, when we integrate context-dependent preferences, we show that if the new feature is of an incremental type and the proportion of consumers who like both firms' new features is high enough, firm B prefers to imitate. This happens because context-dependent preferences cause consumers to lower the valuation of brands that are too distant from each other in the product positioning space and value the common features among the brands more, which, in turn, encourages firms to imitate their rivals. When firm B differentiates, consumers who like both firms' new features feel the loss of the other firm's new feature as a result of choosing one brand over the other. Furthermore, when firm B imitates, the reference point consumers use to derive their losses and gains in the new attribute dimension shifts upward, and hence, consumers perceive a higher loss of the new feature when they do not migrate to a new product under imitation. These two effects make migrating to a new product surprisingly more valuable for consumers (i.e., consumers' willingness to pay for a new product increases) and hence allow both firm B and firm A to charge a higher price for their upgraded products when firm B imitates (i.e., imitation leads to higher competitive prices). If the new feature is incremental and the proportion of firm B's consumers who also like firm A's new feature is high, then firm B's profit gain from charging higher prices to its consumers who also like firm A's new feature offsets its profit loss from not serving its consumers who do not like firm A's new feature, which in turn makes imitation more profitable than differentiation. The intuition for our result is also consistent with the experimental findings. For example, Chernev (2005) provides experimental evidence on how adding options differentiated by complementary features (i.e., those that are liked by all consumers and increase the overall utility of a product if they are provided together) to a given choice set tends to decrease the overall attractiveness of the options in the set by highlighting the deficiencies of the options on the attribute defined by that feature. More specifically, adding new features increases the number of relevant dimensions on which products are evaluated; thus the lack of a given feature is interpreted as a potential loss, which lowers the overall attractiveness of the choice alternatives. Chernev's (2005) findings clearly indicate the need for context management. Following this, we investigate how the degree of similarity between the two brands affects the desire to imitate. Our analysis shows that as the degree of ex ante differentiation between the brands in the product space decreases, firm B's incentive to imitate may even increase.

We later extend our model and endogenize the choice of a new feature for both firms. By choosing which new feature to implement, a firm can also control the proportion of a rival firm's consumers it can attract. In the extended model, firm A can choose among the two new features such that one leads firm B to imitate firm A and the other deters imitation. When consumers exhibit context-dependent preferences, we identify the conditions under which firm A prefers to develop a new feature that will induce firm B to imitate. This happens because when firm B imitates, firm A can charge a higher price for its new product. Therefore, we can show that context management encourages both imitation and accommodating imitation.

Finally, we relax our assumption of symmetric brands and endow one firm with a higher initial market share. We find that our results stated above are robust regardless of whether or not a firm is the dominant firm (i.e., the firm with the bigger market share). Surprisingly, however, our analysis shows that whereas the dominant firm has more incentive to imitate its rival, the dominated firm (i.e., the firm with the smaller market share) has more incentive to accommodate imitation. This means that the asymmetry in firms' incentive to imitate and incentive to accommodate imitation results from the moderating role that their differential market share plays on how much more or less they benefit from price increases in the case of imitation.

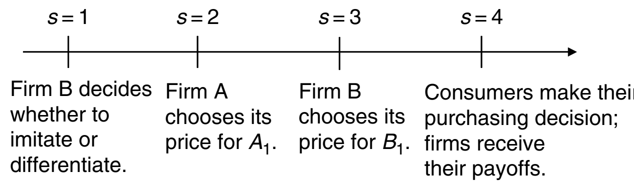
The importance of our paper therefore is not only in demonstrating how one can incorporate robust and well-established behavioral anomalies in game-theoretic models but also in applying this to a rich context that is so fundamental to marketing—namely, the question of imitation and differentiation. The remainder of the paper is organized as follows. In §2, we develop our model and describe the game sequence. Following this, in §3 we solve for the benchmark case in which context management is ignored. In §4 we characterize the second mover's decision as to whether to imitate or differentiate when consumers exhibit context-dependent preferences and investigate the implications of context management for such decisions under different competitive scenarios. Then, in §5 we endogenize the choice of a new feature. In §6, we discuss the robustness checks that we conducted on the main assumptions of our model and discuss their impact on our results. Finally, §7 summarizes the results and discusses implications and directions for future work.

2. Model Setup

Consider a market with two firms, firm A and firm B, selling one product, each denoted as products A_0 and B_0, respectively. Each has a single nonprice attribute that provides utility u_0 to the consumers who value it. Currently, half of the consumers only like and own A_0 (we call them A-type consumers), and the other half only like and own B_0 (we call them B-type consumers).[1]

Firm A develops an upgraded version of A_0 by adding a new feature. The introduction of new features is one of the most common methods for growing sales. Later, in §6 we explore the option of allowing firm A to upgrade A_0 by enhancing it on the existing nonprice attribute dimension and show that our results qualitatively stay the same. We denote firm A's new product as A_1. Following this, at stage 1, firm B can either imitate firm A or improve its product by adding another feature that is equally liked by consumers (we simply assume that technological limitations do not permit firm B to improve on

Figure 1 **Timeline of the Game**



firm A's product on the new dimension). It costs nothing for firm B to pursue either strategy. We denote firm B's new product as B_1. It is important to note that firm B would like to develop the upgraded version of B_0 because otherwise it would not make any sales. Although all consumers receive additional utility u_1 from the new feature of their favorite brand, a proportion α of A (B)-type consumers also likes the new feature of their nonfavorite brand B (A) and receives utility u_1. After firm B chooses its strategy, at stage 2, firm A makes its pricing decision, and at stage 3, firm B makes its pricing decision.[2] At stage 4, consumers decide whether to buy one of the new products (i.e., migrate to a next-generation product) or keep using what they already have. Figure 1 illustrates the timeline of the game. In our basic model, α is the same across the firms and exogenous; i.e., neither firm A nor firm B can control what proportion of the rival's consumers would like its new feature. However, after we solve for the basic model in §5, we relax this assumption and allow α to be different across the firms and endogenous.

For the rest of the paper, we use subscript k and k' to denote a consumer's favorite and nonfavorite brand, respectively, where $k = \{A, B\}$ and p denotes the price.

3. Benchmark Case: No Context-Dependent Preferences

We first analyze the benchmark case ignoring context-dependent preferences and investigate whether firm B would ever prefer to imitate. When a consumer does not buy a new product, he receives utility u_0 from using the product (either A_0 or B_0) that he currently has. When a consumer buys a new product from his favorite brand, he receives a utility of $u_0 + u_1 - p_k$ if he likes the new feature and $u_0 - p_k$ otherwise. Finally, when a consumer buys a new product from his nonfavorite brand, he receives a utility of $u_1 - p_{k'}$ if he likes the new feature and $-p_{k'}$ otherwise.[3]

[1] One may wonder why we do not simply consider two products horizontally differentiated on a single nonprice attribute, rather than model two products that each offer a different nonprice attribute. In fact, horizontal differentiation on a single attribute is a special case of each product having a different attribute; i.e., one can also think of different combinations on a single attribute as different attributes. However, by allowing A_0 and B_0 to have different nonprice attributes (i.e., modeling the general case), we can perform an important robustness check that we explain next and hence prove the generality of our results for different competitive contexts.

[2] Sequential pricing allows us to get rid of mixed-strategy equilibrium and hence makes it much easier to examine the robustness of our arguments through extensions. Furthermore, in many markets product development cycles are long enough for a firm to know its rival's new product plans before it launches its new product.

[3] Interested readers can find the more formal representation of consumer utility functions in Tables A.1 and A.2 in the appendix.

Proposition 1. *When context-dependent preferences do not exist, firm B always prefers to differentiate.*

First, note that because the proportion α of A-type consumers also like the new feature of their nonfavorite brand, i.e., firm B, and receive utility u_1, these consumers would consider buying B_1 regardless of whether firm B imitates or differentiates. Similarly, because the proportion α of B-type consumers also like the new feature of their nonfavorite brand, i.e., firm A, and receive utility u_1, these consumers would consider buying B_1 regardless of whether firm B imitates or differentiates. On the other hand, the proportion $(1-\alpha)$ of A-type consumers only like the new feature of firm A, and thus, they would consider buying B_1 only when firm B imitates. Similarly, the proportion $(1-\alpha)$ of B-type consumers do not like the new feature of firm A, and hence, they would consider buying B_1 only when firm B differentiates. Thus, when firm B imitates, it can only serve to the proportion α of B-type consumers, and when it differentiates, it can serves all the B-type consumers. Given this, when firm B imitates, it has more incentive to steal A-type consumers (to compensate for the loss of the proportion $(1-\alpha)$ of B-type consumers) than when it differentiates. For that reason, the price of B_1 cannot be higher when firm B imiates than when it differentiates. As a result, for firm B, imitation is never more profitable than differentiation.

4. Analysis with Context-Dependent Preferences

In the following, we adopt the linear loss aversion model (LAM) to implement context-dependent preferences. This model has been shown to be one of the better models to implement context effects (see Kivetz et al. 2004a, b)[4] and is used in some recent papers such as Kőszegi and Rabin (2006), Orhun (2009), and Ho et al. (2006) for modeling purposes. In this model a consumer's utility is the sum of absolute utilities of each attribute and relative utilities that consist of gains and losses on each attribute compared with a reference point. Furthermore, in comparative valuation losses loom larger than gains. In this model the reference point is endogenous to the choice set (Kivetz et al. 2004a, Orhun 2009), and as the set's composition changes, the reference point changes and, hence, consumers' preferences. This means that consumers' preferences are context-dependent.

What should the reference point on each attribute be? Kivetz et al. (2004b) and Orhun (2009) show that the linear LAM with a reference point as the centroid of all products can capture all the context effects such as extremeness aversion, asymmetric dominance, asymmetric advantage, enhancement, and detraction effects (Huber et al. 1982, Simonson and Tversky 1992). Because the reference point is the centroid of all products, it is affected by any changes in the choice set (even by changes that do not affect the range of attributes), and hence, it can accommodate various context effects. In our analysis we use the equal weighted average of the absolute utilities in the choice set as the reference point for nonprice attributes. Both in an A-type consumer's choice set (i.e., $\{A_0, A_1, B_1\}$) and in a B-type consumer's choice set (i.e., $\{B_0, B_1, A_1\}$), only two of the products provide absolute utility u_0 on the old attribute that is valued by the consumer. These are A_0 and A_1 for A-type consumers and B_0 and B_1 for B-type consumers. As a result, the equal weighted averages of the absolute utilities on an old attribute dimension are equal to $2u_0/3$. When firm B imitates, there is one new attribute—the new feature offered by firm A. In the choice set, both A_1 and B_1 provide absolute utility u_1 on this new attribute dimension, but neither A_0 nor B_0 provides any utility on that dimension. Thus, the reference point for the new feature offered by firm A is equal to $2u_1/3$. When firm B differentiates, A_1 and B_1 offer different new features. Thus, in the choice set, only one product (i.e., either A_1 or B_1) provides absolute utility u_1 on each new attribute dimension, and naturally, the reference point for a new attribute is equal to $u_1/3$.[5] According to literature on reference price (see Rajendran and Tellis 1994, Park et al. 2000, Mazumdar et al. 2005), the reference price for durable products is the combination of the lowest price in the choice set and the price of the default option. In our model the default option for consumers is not buying anything and there is no cost to consumers who keep using what they currently have, so we choose zero as the reference price.[6]

Finally, to capture loss aversion in our model, we use λ and γ to denote the sensitivity to gains and losses, respectively, with respect to a reference point, where $\gamma > \lambda$.

Next, as we did in the benchmark case, we will lay out consumers' utility functions for different purchasing scenarios. First, recall that when consumers exhibit context-dependent preferences, their utility is the sum of absolute utilities from each attribute and

[4] Kivetz et al. (2004a) show that validation and fit measures indicate that the LAM is one of the three models that outperform the rest.

[5] In the technical appendix (available as supplemental material at http://dx.doi.org/10.1287/mksc.2013.0776), we relax equal weights assumption and show that our results qualitatively stay the same.

[6] One may wonder whether our results would change if the prices of all the products (i.e., including the prices of A_1 and B_1) affect the reference price given that consumers should expect to pay more for an improved product. In the technical appendix, we investigate this issue and show that even if we use equal weighted averages of all the prices in the choice set as the reference price (as we do for nonprice attributes), our results qualitatively stay the same.

comparative utility. Comparative utility is the sum of relative utilities that consist of gains and losses on each attribute compared with a reference point. Then, for a nonprice attribute, the comparative utility is equal to λ (*absolute utility − reference utility*) if absolute utility is greater than reference utility and to γ (*absolute utility − reference utility*) if absolute utility is less than reference utility. Because the reference price is zero, the comparative utility is equal to $\gamma(0 - \textit{price})$. In the following, we will write the comparative utility part in parentheses in utility functions to make it easy for the reader to follow.

Case of imitation: Both new products offer the same new feature (i.e., the new feature offered by firm A). When a consumer does not buy a new product, he receives utility $u_0 + (\lambda(u_0 - 2u_0/3) + \gamma(0 - 2u_1/3))$ if he likes the new feature offered by the new products and $u_0 + \lambda(u_0 - 2u_0/3)$ otherwise. When a consumer buys a new product from his favorite brand, he receives a utility $u_0 + u_1 - p_k + (\lambda(u_0 - 2u_0/3) + \lambda(u_1 - 2u_1/3) + \gamma(0 - p_k))$ if he likes the new feature and $u_0 - p_k + (\lambda(u_0 - 2u_0/3) + \gamma(0 - p_k))$ otherwise. Finally, when a consumer buys a new product from his nonfavorite brand, he receives a utility $u_1 - p_{k'} + (\gamma(0 - 2u_0/3) + \lambda(u_1 - 2u_1/3) + \gamma(0 - p_{k'}))$ if he likes the new feature and $-p_{k'} + (\gamma(0 - 2u_0/3) + \gamma(0 - p_{k'}))$ otherwise.

We also note that, contrary to the conventional wisdom that says that common attributes among the options get canceled in the process of choice (Tversky 1972, Houston and Sherman 1995), more recent experimental work provides evidence that in comparative judgment common attributes among the options in the choice set do not always cancel out during the choice process (Li et al. 2007), and they receive the same or sometimes even higher weights than unique features (Zhang 1995). Moreover, Chernev (2001) shows that adding common features to the alternatives in the choice set can increase one's willingness to pay for his favorite brand over the brands in the choice set.

Case of differentiation: Each firm's new product offers a different new feature. When a consumer does not buy a new product, he receives utility $u_0 + (\lambda(u_0 - 2u_0/3) + \gamma(0 - u_1/3))$ if he only likes the new feature offered by his favorite brand and $u_0 + (\lambda(u_0 - 2u_0/3) + \gamma(0 - u_1/3) + \gamma(0 - u_1/3))$ if he likes both brands' new features. When a consumer buys a new product from his favorite brand, he receives a utility $u_0 + u_1 - p_k + (\lambda(u_0 - 2u_0/3) + \lambda(u_1 - u_1/3) + \gamma(0 - p_k))$ if he only likes the new feature offered by his favorite brand and $u_0 + u_1 - p_k + (\lambda(u_0 - 2u_0/3) + \lambda(u_1 - u_1/3) + \gamma(0 - u_1/3) + \gamma(0 - p_k))$ if he likes both brands' new features. Finally, when a consumer buys a new product from his nonfavorite brand, he receives a utility $u_1 - p_{k'} + (\gamma(0 - 2u_0/3) + \lambda(u_1 - u_1/3) + \gamma(0 - u_1/3) + \gamma(0 - p_{k'}))$ if he likes the new feature offered by his nonfavorite brand and $-p_{k'} + (\gamma(0 - 2u_0/3) + \gamma(0 - u_1/3) + \gamma(0 - p_{k'}))$ otherwise.[7]

In the following proposition, we investigate whether firm B ever prefers to imitate when consumers exhibit context-dependent preferences. But before doing so, we note that the assumed original product differentiation (i.e., the positioning of A_0 and B_0) is consistent with context-dependent preferences. To check this issue, we investigate whether firm A and/or firm B would prefer to choose their initial nonprice attributes such that there exist consumers who like both attributes equally when consumers exhibit context-dependent preferences. Our analysis shows that neither firm prefers to implement their first attribute such that there exist consumers who like both attributes equally. Therefore, the assumed original positioning for firm A and firm B is consistent with context-dependent preferences. Please see the technical appendix for details of this analysis.

Proposition 2. *Firm B prefers to imitate firm A iff $\alpha > \alpha^*$ and $u_1 < u_1^*$. That is, if the proportion of consumers who also like the new feature offered by their nonfavorite brand is high enough and the new feature is of an incremental type, then firm B would mimic firm A.*

To understand the intuition behind why this equilibrium would survive for $\alpha > \alpha^*$ and $u_1 < u_1^*$, let us consider the deviations from this equilibrium for firm B. Firm B can deviate and either maintain the status quo (i.e., not offer any new product) or compete by offering a differentiated product. If firm B were to maintain the status quo, then it will make no sales and hence lose profits from the proportion α of B-type consumers who are willing to pay for this new feature. This shows that status quo will not survive.

What if firm B deviates to differentiation? In this case firm B's trade-offs are more involved. Because the proportion $(1 - \alpha)$ of B-type consumers do not care for the new attribute of A_1, when firm B differentiates, it offers something of value to the proportion $(1 - \alpha)$ of B-type consumers, and this can generate profit. Moreover, this additional profit increases with u_1. On the other hand, because in case of differentiation the proportion α of B-type consumers likes both firms' new features, they would feel the loss of firm A's new feature when they buy B_1. Similarly, the proportion α of A-type consumers feels the loss of firm B's new feature when they buy A_1. We can see this to be true since $\gamma > \lambda$. Given this and the fact that the reference point (utility) for a new attribute is lower when firm B differentiates than when firm B imitates, we obtain the result that the proportion α of B-type consumers receives lower utility and is

[7] Interested readers can find the more formal representation of consumer utility functions in Tables A.3 and A.4 in the appendix.

consequently willing to pay less for the new product offered by firm B when it differentiates than when it imitates. So firm B has to balance the loss in gains from the proportion α of B-type consumers and the gain in profits from the proportion $(1-\alpha)$ of B-type consumers when it differentiates. If α is high enough (i.e., $\alpha > \alpha^*$) and the new feature is of an incremental type (i.e., $u_1 < u_1^*$), the loss in gains from the proportion α of B-type consumers, offsets the gain in profits from the proportion $(1-\alpha)$ of B-type consumers, and hence, firm B does not want to deviate to differentiation. It is important to note that the subsequent price competition does not dissipate this advantage of imitation. Any attempt by firm B to undercut firm A to lure A-type consumers results in an equal erosion in profits from the proportion α of B-type consumers without gaining the patronage of the proportion $(1-\alpha)$ of B-type consumers. Realizing this disincentive for firm B to compete aggressively, firm A prices high to extract the rent from its consumers. This means that both firms are able to charge higher prices when firm B imitates.[8]

To substantiate this further, we show that the strategies do not alter the degree of substitutability between A_1 and B_1 either for the proportion α of A-type consumers or for the proportion α of B-type consumers. To see this, from the utility functions given before Proposition 2, we can see that both for the proportion α of A-type consumers and for the proportion α of B-type consumers the incremental utility of buying the new product from their favorite firm rather than from the competing firm is equal to $u_0(3+2\gamma+\lambda)/3$, regardless of whether firm B imitates or differentiates. Similarly, in the absence of context dependence (the benchmark case), regardless of whether firm B imitates or differentiates, both the proportion α of A-type consumers and the proportion α of B-type consumers receive utility $u_0 + u_1 - p_k$ when they buy the new product from their favorite brand and utility $u_1 - p_{k'}$ when they buy the new product from their nonfavorite brand, resulting in an incremental utility u_0. Thus, the result in Proposition 2 is not because the context-dependent preferences alter the substitutability between A_1 and B_1 across the strategies that firm B can pursue. The result in Proposition 2 arises because if consumers exhibit context-dependent preferences when A_1 and B_1 share the same new feature, their attractiveness relative to the no-buy option increases, and hence, consumers are more willing to pay for new products offered by their favorite brand. Therefore, in a way, our result can also be seen as the product that is being imitated (A_1) increases the attractiveness of the imitation (B_1) relative to the no-buy option.

Recall from §1 that Chernev (2005) experimentally shows that adding an option differentiated on a feature liked by all consumers decreases the overall attractiveness of the choice set by highlighting the deficiencies of the options on the attribute defined by this feature. The extant behavioral literature has also shown that the attractiveness of alternatives is influenced by comparison with others in the choice set so that the preference for the no-choice option decreases with the introduction of a new alternative that is clearly inferior in overall attractiveness (Dhar 1997a, b). This is consistent with our result that when firm B imitates, A_1 becomes a clearly inferior alternative to B_1. Therefore, the behavioral intuition behind Proposition 2 is consistent with the experimental findings.

In the following we will extend our basic model and derive implications of context-dependent preferences for different competitive scenarios.

4.1. Can Less Differentiation (Greater Similarity) Lead to More Imitation?

In our basic model we assumed maximum ex ante differentiation between brands A and B; i.e., A-type consumers do not derive positive utility from B_0, and similarly, B-type consumers do not derive positive utility from A_0. Next, we will relax this and solve for the general case. Our analysis will show whether firm B has more or less of an incentive to imitate firm A as the ex ante differentiation between the firms in the product space decreases.

Let A_0 (B_0) have a single nonprice attribute that provides utility u_0 (ρu_0) to A-type consumers and utility ρu_0 (u_0) to B-type consumers, where ρ is the degree of ex ante differentiation between A_0 and B_0 and $0 < \rho < 1$. Therefore, as ρ increases, the differentiation between A_0 and B_0 decreases. In §4 we solved for a special case where $\rho = 0$. In the general case, one would expect that as ρ increases, the target consumers of firms A and B become more similar to each other. This means that as ρ increases, the probability of a consumer liking the new feature of the rival brand (i.e., α) should increase. For this reason, we assert that α should be a function of ρ such that $\alpha(\rho=0) > 0$, $\partial\alpha/\partial\rho > 0$, and $\alpha(\rho=1) = 1$.[9]

Proposition 3. *Firm B prefers to imitate iff $\alpha > \alpha^*$ and $u_1 < u_1^*(1-\rho)$. If brands are ex ante differentiated ($\rho < \rho^*$) enough, then as the differentiation between the brands decreases, firm B's incentive to imitate firm A increases.*

Per Proposition 3 it is clear that under context-dependent preferences as brands become more similar to each other, firm B's incentive to imitate may

[8] We note that even if we do not model loss aversion in prices we would get exactly the same result as in Proposition 2. Please see the technical appendix for a formal proof of this claim.

[9] Note that in this case, the reference point for an old nonprice attribute is equal to $((2+\rho)/3)u_0$. The updated consumer utility functions are provided in Table A.5 in the appendix.

increase (i.e., the region in which firm B prefers to imitate expands; $\partial(u_1^*(1-\rho))/\partial\rho > 0$ for $\alpha > \alpha^*$). As brands become more similar (or less differentiated) to each other, there are two countervailing forces affecting firm B's incentive to imitate. On one hand, the tastes of their focal segments become more similar to each other, and hence, the proportion of B-type consumers who like firm A's new feature (i.e., α) increases. As α increases, the benefit derived from imitating firm A increases, which in turn encourages firm B to imitate. On the other hand, when firm B imitates, firm A needs to charge a lower price for its new product A_1 to prevent firm B from stealing A-type consumers, which puts pressure on firm B's price and hence decreases its incentive to imitate. If the ex ante differentiation between brands is high enough (i.e., ρ is low, $\rho < \rho^*$), the former force dominates and encourages firm B to imitate. This result shows that when consumers exhibit context-dependent preferences, there is no monotonic relationship between the degree of differentiation and the firms' incentive to imitate each other.

4.2. Can a Dominant Firm Have More Incentive to Imitate?

In our basic model we treated both firms equal in every way. Next, we will relax the assumption of symmetric firms in market share and instead assume that one firm is more dominant than the other in its initial market share position. This extension allows us to examine whether the incentive to imitate is moderated by the initial market position. Let the size of A-type consumers be equal to $(1+n)/2$ and the size of B-type consumers be equal to $(1-n)/2$, where $-1 < n < 1$. If $n > 0$, we call firm A (B) the dominant (dominated) firm, and if $n < 0$, we call firm B (A) the dominant (dominated) firm.

Proposition 4. *Regardless of whether firm B is dominant or dominated, it prefers to imitate iff the proportion of consumers who also like the new feature of their nonfavorite brand is high* ($\alpha > \alpha^*$) *and the new feature is of an incremental type* ($u_1 < \hat{u}_1$). *Firm B has more incentive to imitate when it is the dominant firm* ($\partial\hat{u}_1/\partial n < 0$).

According to Proposition 4, the result derived in Proposition 2 is robust to any market share advantage. Counterintuitively, we also see that the dominant firm has more incentive to imitate its rival. This happens because α increases with market share, and hence, firm B would enjoy the benefits of imitating the rival more when it is the dominant firm than when it is the dominated firm.

We also note that in the absence of context-dependent preferences, the dominant firm would prefer to differentiate. But if the preferences are context-dependent, both firms are able to charge higher prices when the dominant firm imitates than when it differentiates. Thus, what is surprising about the result in Proposition 4 is that the differential incentive to imitate the rival is *not due to* the dominant firm's competitive advantage (such as cost advantage) to beat the dominated firm in case of imitation, as suggested by the extant literature (Thomadsen 2007). The asymmetry in firms' incentive to imitate results from the moderating role that their differential market share plays on how much more or less they benefit from price increases in the case of imitation when preferences are context-dependent.

So far we have identified the underlying mechanism that leads firm B to imitate when the preferences are context-dependent and proved the robustness of this mechanism in different competitive contexts. In doing so we simply assumed that the proportion of consumers who also like the new feature of their nonfavorite brand (i.e., α) is exogenous and the same across the firms. In the following section, we will allow firms to choose which new fetaure to implement and hence control the proportion of the rival firm's consumers whom they can attract. Our goal is to retest the validity of the result stated in Proposition 2 and understand the implications of context management for the pioneer firm's incentives to accommodate imitation.

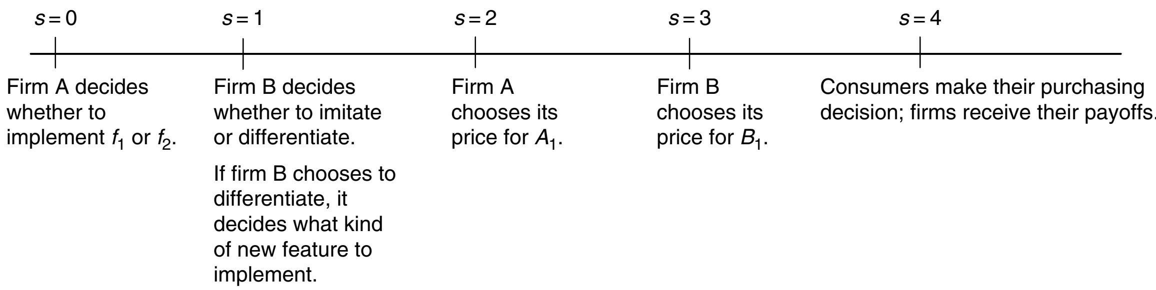
5. Endogenizing the Choice of New Feature

Let there be two new features from which a firm can choose to upgrade its current product. One of the features (we denote this feature as f_1-type) will be liked by all the rival consumers (i.e., $\alpha = 1$), whereas the other feature (we denote this feature as f_2-type) will not be liked by any of the rival consumers (i.e., $\alpha = 0$); it costs the same to develop either new feature. The extended timeline is presented in Figure 2. At stage 0, firm A chooses which new feature to implement. At stage 1, firm B decides whether to imitate firm A or differentiate. If firm B chooses to differentiate, it also gets to choose which new feature to develop. The rest of the timeline follows the one presented in §2.

Proposition 5. *In the absence of context-dependent preferences, regardless of firm A's product development decision, firm B never prefers to imitate. When consumers exhibit context-dependent preferences, firm B prefers to imitate iff firm A chooses to develop an f_1-type new feature and* $u_1 < u_1^*(\alpha = 1)$.

As in the basic model, in the absence of context-dependent preferences, firm B will not imitate firm A. When preferences are context-dependent, if firm A chooses to develop an f_2-type new feature, firm B would still not find it profitable to imitate because

Figure 2 The Timeline of the Extended Game



none of the B-type consumers would like firm A's new feature. However, if firm A develops an f_1-type new feature (i.e., a new feature that is liked by all the B-type consumers), as long as the new feature is more of an incremental type (i.e., $u_1 < u_1^*(\alpha = 1)$), firm B prefers to imitate firm A. The logic behind this result follows the intuition of Proposition 2.

Because in the absence of context-dependent preferences firm B does not prefer to imitate, firm A's product development decision will not have an impact on firm B's decision. On the other hand, when preferences are context-dependent, firm A can lead firm B to imitation if it chooses to develop an f_1-type new feature. As we know from Proposition 5, this can happen if $u_1 < u_1^*(\alpha = 1)$. Given that our goal is to retest the validity of the result stated in Proposition 2 and understand the implications of context management for the pioneer firm's incentives to accommodate imitation, we have the following analysis when $u_1 < u_1^*(\alpha = 1)$.

Proposition 6. *Firm A prefers to develop an f_1-type new feature iff the new feature is of an incremental type ($u_1 < \tilde{u}_1$, where $\tilde{u}_1 < u_1^*(\alpha = 1)$). For $u_1 < \tilde{u}_1$, when firm A develops an f_1-type new feature, firm B prefers to imitate.*

First, we show that for $u_1 < \tilde{u}_1 < u_1^*(\alpha = 1)$, firm A prefers to develop an f_1-type new feature; following this, firm B imitates. Thus Proposition 6 validates the result stated in Proposition 2.

Second, even if firm A has the option of developing a new feature (i.e., f_2-type) that will deter firm B from imitating, according to Proposition 6, if the new feature is of an incremental type, firm A prefers to pick a new feature (i.e., f_1-type) that will induce the follower to imitate. To understand the intuition behind this result, let us first understand what happens when firm A develops an f_2-type new feature. When firm A develops an f_2-type new feature, firm B differentiates either by developing an f_1-type new feature (i.e., a feature all A-type consumers like) or by developing an f_2-type new feature (i.e., a feature that is not liked by any of the A-type consumers). In either case, the maximum profit that firm A can make is equal to the monopoly profits. Next, we will discuss what happens when firm A develops an f_1-type new feature. In this case, firm B imitates and there exist two countervailing forces affecting the price of A_1. On one hand, the reference point for firm A's new feature shifts upward. As a result, A-type consumers feel a higher loss if they do not migrate to A_1 but keep using A_0, which in turn increases A-type consumers' willingness to pay for A_1. This means that the monopoly price firm A can charge to A-type consumers will be higher. On the other hand, firm A needs to prevent firm B from stealing its consumers. This discourages firm A from charging a high price for its new product. However, when the new feature is of an incremental type (i.e., $u_1 < \tilde{u}_1$), firm B's incentive to steal A-type consumers is very low. Therefore, for $u_1 < \tilde{u}_1$ this negative competitive force is dominated by the aforementioned positive force and allows firm A to charge a higher price for A_1 when it develops an f_1-type new feature (and firm B imitates) than the monopoly price it can charge when it develops an f_2-type new feature (and firm B differentiates). As a result, firm A makes more profits when it develops an f_1-type new feature than the monopoly profits that it can receive when it develops an f_2-type new feature. Thus, context-dependent preferences encourage firm A to accommodate imitation.

In §4.2, we investigated how the market share advantage affects a firm's incentive to imitate when consumers exhibit context-dependent preferences and found that the dominant firm is more willing to imitate its rival. As a follow-up to that analysis, in the following subsection we will investigate how the market share advantage affects a firm's incentive to implement a new feature that will induce imitation when preferences are context-dependent. More specifically, we aim to understand whether the dominant or the dominated firm has more incentive to accommodate imitation.

5.1. Case of Asymmetric Firms: Can a Dominated Firm Have More Incentive to Accommodate Imitation?

As in §4.2, let the size of A-type consumers be equal to $(1 + n)/2$ and let the size of B-type consumers be equal to $(1-n)/2$, where $-1 < n < 1$. In this case, as we know from Proposition 4, firm B prefers to imitate only if firm A chooses to develop an f_1-type new feature and $u_1 < \hat{u}_1(\alpha = 1)$. Thus, we will have the following analysis when $u_1 < \hat{u}_1(\alpha = 1)$.

PROPOSITION 7. *Regardless of whether firm A is dominant or dominated, it chooses to develop an f_1-type new feature iff the new feature is of an incremental type ($u_1 < \check{u}_1$, where $\check{u}_1 < \hat{u}_1(\alpha = 1)$). For $u_1 < \check{u}_1$ when firm A develops an f_1-type new feature, firm B prefers to imitate. Firm A is more willing to accommodate imitation when it is the dominated firm ($\partial \check{u}_1/\partial n < 0$).*

As we know from Proposition 4, the dominant firm has more incentive to imitate its rival than the dominated firm, and according to Proposition 7, the dominated firm is more willing to accommodate imitation. Why does a competitively disadvantaged firm have more incentive to accommodate imitation? Because the dominant firm has a higher market share, it would have less incentive to steal the rivals' consumers when it imitates. Thus, if firm B is the dominant firm, firm A (i.e., the dominated firm) does not need to be concerned about preventing firm B from stealing A-type consumers when it develops an f_1-type new feature and encourages firm B to imitate. Because the competitive pressure on the price of the dominated firm's new product is low when it is imitated, the dominated firm reaps the benefit of being imitated (as explained in Proposition 6) more than the dominant firm.

We note that in our model the dominated firm has a higher willingness to accommodate imitation *not because* (1) it is costlier for the dominated firm to prevent its rival from imitating or (2) being imitated by the dominant firm validates the viability of the technology and increases consumers' confidence in the dominated firm's new product. The asymmetry in firms' incentives to accommodate imitation results from the moderating role that their differential market share plays on how much more or less they benefit from being imitated when consumer preferences are context-dependent.

6. Robustness Checks

In this section we discuss two important robustness checks we conducted on our assumptions. The formal proofs of these are provided in the technical appendix.

Modeling of the choice set formation: We assumed that for A-type consumers the choice set is $\{A_0, A_1, B_1\}$, and for B-type consumers it is $\{B_0, A_1, B_1\}$. However, one may wonder what would happen if the choice set is $\{\{A_1, B_1\}, A_0\}$ for A-type consumers and $\{\{A_1, B_1\}, B_0\}$ for B-type consumers. In other words, what if a consumer first chooses among the new products and then decides whether to migrate to the chosen new product or stay with what he is currently using. Dhar and Nowlis (2004) establish that in such cases, consumers would still use attribute-based comparative judgment, and moreover, the negative consequences of relative comparisons are more salient. This means that the asymmetric dominance effect caused by imitation should stay the same even if we let consumers first choose among the new products and then decide whether to migrate to the preferred new product. Furthermore, the case in which consumers first choose among the new products and then decide whether to migrate to the preferred new product is very much like the choice across two categories (Simonson and Tversky 1992): the old product category that consists of either A_0 or B_0 and the new product category that consists of A_1 and B_1. Simonson and Tversky (1992) argue that asymmetric dominance within a category increases the attractiveness of that category compared with the other category in the choice set. For our model, this implies that once a consumer makes the decision to buy a new product rather than stay with his old one, after choosing which new product to buy, the existence of the competing new product should still affect the decision. This means that the competing new product should also be included in the reference point formation. In the technical appendix, we relax the equal weights assumption on the reference point for nonprice attributes and show that for any weight assigned to the options in the choice set to model the reference point for nonprice attributes, Proposition 2 should qualitatively stay the same. This implies that Proposition 2 should qualitatively stay the same even if consumers first choose among the new products and then decide whether to migrate to the chosen new product or stay with what they are currently using.

Modeling the way firm A improves its existing product: In our basic model, we assumed that firm A improves its existing product A_0 by adding a new attribute that provides utility u_1. One wonders whether the result in Proposition 2 holds when firm A improves its existing product without adding a new feature. Thus, to investigate this issue, we allow firm A to improve its existing product A_0 by raising its utility on its existing nonprice attribute from u_0 to $u_0 + u_1$, rather than adding a new feature. In this modified model, firm B decides whether to improve B_0 by imitating firm A and adding firm A's nonprice attribute at the utility level u_1 or by raising the utility of its product on its own nonprice attribute from u_0 to $u_0 + u_1$ at the same cost. To make the imitation as a viable option for firm B, we had to modify our demand structure such that a proportion α of consumers like both firms' existing nonprice attributes equally and half of these consumers own A_0 whereas the other half owns B_0. A proportion $(1-\alpha)/2$ of consumers only likes firm A's nonprice attribute and owns A_0, and the other proportion $(1-\alpha)/2$ of consumers only likes firm B's nonprice attribute and owns B_0. Our analysis shows that without context-dependent preferences, firm B would never imitate. But when consumers exhibit context-dependent preferences, if the proportion of the consumers who like both firms' existing nonprice attributes equally (i.e., α) is high enough and the improvement is of an incremental type (i.e., u_1 is not too high), firm B prefers to imitate (i.e., add firm A's old nonprice attribute at the utility level u_1). Thus, Proposition 2 qualitatively stays the same.

7. Discussion and Directions for Future Research

Conventional wisdom that uses a standard microeconomic model of consumers and firms states that a firm trying to stay competitive differentiates itself from its rivals to make demand less substitutable and mitigate the resulting price competition. In this paper we explore a firm's incentive to differentiate or to imitate when consumers exhibit context-dependent preferences. Drawing on the literature from behavioral decision theory, we propose that context-dependent preferences play a crucial role in moderating a firm's strategic choice in positioning. We considered a model with two horizontally differentiated firms that serve a set of consumers. One firm (A) upgrades its existing product by adding a new feature, and to effectively compete with firm A, the other firm (B) has a choice to imitate on the same feature as firm A or differentiate by adding a different new feature that will be as liked just as much. To rule out any cost-based explanation, we assumed that there are no differences in the costs in pursuing either strategy. In the absence of context-dependent preferences, we found that firm B would always prefer to differentiate. However, when consumers' evaluations are context-dependent, i.e., consumers consider not only the absolute utility of a product but the relative utility of the product with respect to a reference that is endogenous to the choice set, we showed that firm B chooses to imitate firm A. This happens because context-dependent preferences cause consumers to dislike the brands being too distant from each other in the product positioning space and increase their willingness to pay for their favorite brand when it shares common features with the rival brand, which in turn allows a firm to charge a higher price when it mimics its rival. In other words, when preferences are context-dependent, the leader's product may enhance the attractiveness of the imitation.[10] Our analysis also revealed that this impact of context management on a firm's decision as to whether to imitate or not is strong enough that as the degree of ex ante differentiation between the firms in the product space decreases, the incentive to imitate may even increase.

We showed that not only the second mover but also the leader charges a higher price for its new product in case of imitation, which encourages the leader to pick a new feature to implement such that it induces imitation by the second mover. This means that when consumers exhibit context-dependent preferences, imitation can make both rival products even more valuable in the eyes of consumers and lead to higher prices. As a result, the need for context management both encourages a firm to imitate and causes the other firm to encourage imitation. We also showed that this is robust to whether a firm is dominant (enjoys a higher market share) or dominated. However, our analysis revealed that although the dominant firm has more incentive to imitate, the dominated firm is more willing to accommodate imitation. What is interesting about this outcome is that the asymmetry in firms' willingness to imitate and willingness to accommodate imitation does not come from the competitive advantage or disadvantage (such as cost advantage) rivals experience during their interactions, but it results from the asymmetry in how much they utilize from a price increase in case of imitation.

To summarize, our main results are as follows.

1. In the absence of context dependence, a second mover always prefers to differentiate; in the presence of context dependence, it chooses to imitate under some conditions.
2. The incentive to imitate may increase as the ex ante differentiation between brands decreases.
3. When the first mover acts with foresight and has flexibility in its choice of feature to choose to market, under some conditions it prefers to choose a feature that the follower can imitate.
4. Under context dependence, the dominant firm has greater incentive to imitate, and the dominated firm is more willing to accommodate such imitation.

Given the robust effect of context-dependent preferences on firms' decisions to imitate and to

[10] Carpenter and Nakamoto (1989) also claim that more diverse competition (i.e., greater dissimilarity among brands) should produce more price competition. However, the underlying mechanism in their paper is very different from ours. In their work the pioneer's location constitutes the ideal point for consumers. For that reason, if the late entrant locates closer to the pioneer, this increases the perceptual prominence of the pioneer. As a result, the pioneer becomes more distinct and the late entrant becomes less so. However, if the late entrant locates away from the pioneer, this deteriorates the pioneer's advantage, and hence, the pioneer's price sensitivity to the late entrant increases. On the other hand, remember that our result is driven not by the change in brands' cross-price elasticities but by the change in a brand's own-price elasticity.

accommodate imitation, one wonders in which product categories and in what type of market environments consumers exhibit more strongly context-dependent preferences. The extant experimental and field work that show how preferences can change from context to context uses data that cover a great range of product categories, from computers to paper towels, (for example, see Simonson and Tversky 1992) and economic domains including housing markets, financial markets, insurance markets, and labor markets (for a complete list, see DellaVigna 2009). Furthermore, Kivetz et al. (2004b) argue that context-dependent preferences can exist also in business-to-business markets and complex buying situations that contain group purchasing decisions and augmented products and that the utility model we use in this paper (i.e., LAM) can be used for these situations as well. Even though the behavioral literature does not provide conclusive evidence regarding in which markets or product categories consumers exhibit more strongly context-dependent preferences, it points out some other factors that can possibly affect the degree of context dependency that consumers' preferences exhibit. Simonson (2008) claims that preferences consist of both inherent preferences that are independent of context and relatively stable (i.e., the absolute utility part in our model) and the constructed preferences that are context-dependent (i.e., the comparative utility part in our model). Simonson suggests that constructed preferences should dominate the overall preferences when a consumer faces either not-yet-experienced options or options that can provide very limited or no experience.[11] Hoeffler and Ariely (1999) and List (2003, 2004) also show that reference dependence diminishes as consumers gain more market experience. Besides the experience, the composition of the choice set and how consumers make their purchasing decision can also affect how strongly context-dependent preferences are. In particular, if the options in the choice set are quite uncomparable, consumers make habitual purchasing, or if there is time pressure during the decision-making process, then preferences are less prone to context effects (Dhar et al. 2000, Kivetz et al. 2004a, Simonson 2008).

We believe that our paper adds to the growing marketing literature that adopts the behavioral economic paradigm to provide insights on marketing phenomena and firms' strategies (Hardie et al. 1993; Greenleaf 1995; Kopalle et al. 1996; Feinberg et al. 2002; Amaldoss and Jain 2005a, b; Cui et al. 2007; Lim and Ho 2007; Amaldoss and Jain 2008a, b; Ho and Zhang 2008; Heidhues and Koszegi 2008; Syam et al. 2008; Jain 2009; Orhun 2009; Chen et al. 2010; Grubb 2009; Rooderberk et al. 2011). Moreover, we provide insight to managers regarding how to adopt their competitive strategies (i.e., whether to imitate and whether to accommodate or deter imitation) when consumers' preferences exhibit context dependence. Several extensions can be considered. For example, one could model differential fixed costs that depend on the degree of differentiation from existing locations, determine the uncertainty in evaluating new offerings to moderate the role of context-dependent preferences, and incorporate heterogeneity in context-dependent preferences among consumers to derive boundary conditions on our results.

[11] Kivetz et al. (2008) argue that the consumers' preferences should be a linear combination of these two components.

Supplemental Material

Supplemental material to this paper is available at http://dx.doi.org/10.1287/mksc.2013.0776.

Acknowledgments

The authors thank Ravi Dhar, Tony Cui, Cynthia Cryder, and Joseph Goodman for valuable suggestions.

Appendix

For the proofs, we use subscripts A and B to refer to A-type consumers and B-type consumers, respectively. We use subscript n to denote a consumer who does not like the rival firm's new feature and, consequently, would not value it even if his own firm were to supply that feature through imitation. We use subscript b to denote a consumer who likes the new feature regardless of which firm supplies it. For example, $u^{B_1}_{(A,b)}$ denotes the utility of buying firm B's new product B_1 for an A-type consumer who likes both new features (i.e., when firm B chooses to differentiate).

Proof of Proposition 1. In case of imitation, since the proportion $(1-\alpha)$ of B-type consumers do not value firm A's new feature, they would not buy a new product (from Table A.1, one can see that $u^{B_0}_{(B,n)} > u^{B_1}_{(B,n)}$ and $u^{B_0}_{(B,n)} > u^{A_1}_{(B,n)}$).

For $u_1 < u_0$, since $u^{A_0}_{(A,\cdot)} > u^{B_1}_{(A,\cdot)}$ $\forall p_B > 0$ and $u^{B_0}_{(B,b)} > u^{A_1}_{(B,b)}$ $\forall p_A > 0$, firm B (firm A) would not be able to serve any of the A-type (B-type) consumers. Thus, both firms can charge a monopoly price for their new products (i.e., $p_A = p_B = u_1$), and $\pi^*_{i,A} = \frac{u_1}{2}$ and $\pi^*_{i,B} = \frac{\alpha u_1}{2}$.

For $u_1 > u_0$, when firm A charges $p_A = u_1$, if firm B charges $p_B = u_1$, then $\pi^*_{i,B} = \frac{\alpha u_1}{2}$, and if it charges $p_B = u_1 - u_0 - \varepsilon$, then $\pi^*_{i,B} = \frac{(1+\alpha)(u_1-u_0-\varepsilon)}{2}$. Given that $\frac{\alpha u_1}{2} > \frac{(1+\alpha)(u_1-u_0)}{2}$ for $u_0 < u_1 < u_0(1+\alpha)$, $\pi^*_{i,A} = \frac{u_1}{2}$ and $\pi^*_{i,B} = \frac{\alpha u_1}{2}$.

For $u_0(1+\alpha) < u_1$, $\frac{\alpha u_1}{2} < \frac{(1+\alpha)(u_1-u_0)}{2}$. Thus, for $u_0(1+\alpha) < u_1$, unless firm A charges less than u_1 for A_1, firm B would set $p_B = u_1 - u_0 - \varepsilon$ and serve all the A-type consumers. However, when firm A charges $p_A = \frac{\alpha u_1}{1+\alpha} + u_0$, where $\frac{\alpha u_1}{1+\alpha} + u_0 < u_1$, if firm B charges $p_B = u_1$, then $\pi^*_{i,B} = \frac{\alpha u_1}{2}$, and if it charges $p_B = \frac{\alpha u_1}{1+\alpha} - \varepsilon$, then $\pi^*_{i,B} = \frac{(1+\alpha)(\alpha u_1/(1+\alpha)-\varepsilon)}{2}$. Since $\frac{(1+\alpha)}{2}(\frac{\alpha u_1}{1+\alpha} - \varepsilon) < \frac{\alpha u_1}{2}$ for $u_0(1+\alpha) < u_1 < 2u_0(1+\alpha)$, $\pi^*_{i,A} = \frac{(\alpha u_1/(1+\alpha)-u_0)}{2}$ and $\pi^*_{i,B} = \frac{\alpha u_1}{2}$.

For $u_1 > 2u_0(1+\alpha)$, $\frac{(1+\alpha)}{2}(\frac{\alpha u_1}{1+\alpha} - \varepsilon) > \frac{\alpha u_1}{2}$. Hence, for $u_1 > 2u_0(1+\alpha)$, unless firm A charges such that $(p_A - u_0 - \varepsilon)\frac{1+\alpha}{2} < (p_A + u_0 - \varepsilon)\frac{\alpha}{2}$, firm B would charge a low enough price for B_1 and serve all the A-type consumers.

Table A.1 Consumers' Utility Functions in the Absence of Context-Dependent Preferences When Firm B Imitates

Purchase scenario	Utility functions
A-type consumer buys A_1	$u^{A_1}_{(A,\cdot)} = u_0 + u_1 - p_A$
A-type consumer buys B_1	$u^{B_1}_{(A,\cdot)} = u_1 - p_B$
A-type consumer makes no purhase	$u^{A_0}_{(A,\cdot)} = u_0$
B-type consumer who also likes firm A's new feature buys B_1	$u^{B_1}_{(B,b)} = u_0 + u_1 - p_B$
B-type consumer who does not like firm A's new feature buys B_1	$u^{B_1}_{(B,n)} = u_0 - p_B$
B-type consumer who also likes firm A's new feature buys A_1	$u^{A_1}_{(B,b)} = u_1 - p_A$
B-type consumer who does not like firm A's new feature buys A_1	$u^{A_1}_{(B,n)} = -p_A$
B-type consumer makes no purhase	$u^{B_0}_{(B,\cdot)} = u_0$

Therefore, for $u_1 > 2u_0(1+\alpha)$, firm A prefers to charge $p^*_A = u_0(1+2\alpha)$. In this case, $p^*_B = 2u_0(1+\alpha)$, $\pi^*_{i,A} = \frac{u_0(1+2\alpha)}{2}$, and $\pi^*_{i,B} = u_0(1+\alpha)\alpha$.

In summary, under imitation, $\pi^*_{i,B} = \frac{\alpha u_1}{2}$ if $u_1 < 2u_0(1+\alpha)$ and $\pi^*_{i,B} = u_0(1+\alpha)\alpha$ if $u_1 > 2u_0(1+\alpha)$.

Under differentiation, since proportion $(1-\alpha)$ of A-type (B-type) consumers do not like firm B's (firm A's) new feature, these consumers would never even consider buying B_1 (A_1) (from Table A.2, one can see that $u^{A_0}_{(A,n)} > u^{B_1}_{(A,n)}$ and $u^{B_0}_{(B,n)} > u^{A_1}_{(B,n)}$).

For $u_1 < u_0$, since $u^{A_0}_{(A,b)} > u^{B_1}_{(A,b)}$ $\forall p_B > 0$ and $u^{B_0}_{(B,b)} > u^{A_1}_{(B,b)}$ $\forall p_A > 0$, firm B would not be able to serve any of the A-type consumers, and similarly, firm A would not be able to serve any of the B-type consumers. In this case, both firms can charge a monopoly price, and $\pi^*_{d,A} = \pi^*_{d,B} = u_1/2$.

For $u_1 > u_0$, when firm A charges $p_A = u_1$, if firm B charges $p_B = u_1$, then $\pi^*_{d,B} = \frac{u_1}{2}$, and if it charges $p_B = u_1 - u_0 - \varepsilon$, then $\pi^*_{d,B} = \frac{(1+\alpha)(u_1-u_0-\varepsilon)}{2}$. Since $\frac{(1+\alpha)(u_1-u_0)}{2} < \frac{u_1}{2}$ for $u_0 < u_1 < \frac{u_0(1+\alpha)}{\alpha}$, $\pi^*_{d,A} = \pi^*_{d,B} = \frac{u_1}{2}$.

Table A.2 Consumers' Utility Functions in the Absence of Context-Dependent Preferences When Firm B Differentiates

Purchase scenario	Utility functions
A-type consumer buys A_1	$u^{A_1}_{(A,\cdot)} = u_0 + u_1 - p_A$
A-type consumer who also likes firm B's new feature buys B_1	$u^{B_1}_{(A,b)} = u_1 - p_B$
A-type consumer who does not like firm B's new feature buys B_1	$u^{B_1}_{(A,n)} = -p_B$
A-type consumer makes no purchase	$u^{A_0}_{(A,\cdot)} = u_0$
B-type consumer buys B_1	$u^{B_1}_{(B,\cdot)} = u_0 + u_1 - p_B$
B-type consumer who also likes firm A's new feature buys A_1	$u^{A_1}_{(B,b)} = u_1 - p_A$
B-type consumer who does not like firm A's new feature buys A_1	$u^{A_1}_{(B,n)} = -p_A$
B-type consumer makes no purchase	$u^{B_0}_{(B,\cdot)} = u_0$

For $\frac{u_0(1+\alpha)}{\alpha} < u_1$, $\frac{(1+\alpha)(u_1-u_0)}{2} > \frac{u_1}{2}$. Therefore, for $\frac{u_0(1+\alpha)}{\alpha} < u_1$, unless firm A charges less than u_1, firm B would set $p_B = u_1 - u_0 - \varepsilon$ and sell to proportion α of A-type consumers. In this case, firm A would be able to sell A_1 only to proportion $(1-\alpha)$ of A-type of consumers and receive $\pi_{d,A} = \frac{u_1(1-\alpha)}{2}$. However, when firm A charges $p_A = \frac{u_1}{1+\alpha} + u_0$, where $\frac{u_1}{1+\alpha} + u_0 < u_1$, if firm B charges $p_B = u_1$, then $\pi^*_{d,B} = \frac{u_1}{2}$, and if it charges $p_B = \frac{u_1}{1+\alpha} - \varepsilon$, then $\pi^*_{d,B} = \frac{(1+\alpha)(u_1/(1+\alpha)-\varepsilon)}{2}$. Since $\frac{1+\alpha}{2}\left(\frac{u_1}{1+\alpha} - \varepsilon\right) < \frac{u_1}{2}$ for $\frac{u_0(1+\alpha)}{\alpha} < u_1 < \frac{2u_0(1+\alpha)}{\alpha}$, $\pi^*_{d,A} = \frac{u_1/(1+\alpha)+u_0}{2}$ and $\pi^*_{d,B} = \frac{u_1}{2}$. Note that since $\frac{u_1/(1+\alpha)+u_0}{2} > \frac{u_1(1-\alpha)}{2}$, firm A prefers to charge $p^*_A = \frac{u_1}{1+\alpha} + u_0$ rather than $p_A = u_1$ and serve all the A-type consumers.

For $u_1 > \frac{2u_0(1+\alpha)}{\alpha}$, $\frac{1+\alpha}{2}\left(\frac{u_1}{1+\alpha} - \varepsilon\right) > \frac{u_1}{2}$. Thus, for $u_1 > \frac{2u_0(1+\alpha)}{\alpha}$, unless firm A prices A_1 such that $(p_A - u_0 - \varepsilon)\frac{(1+\alpha)}{2} < (p_A + u_0 - \varepsilon)\frac{1}{2}$, firm B would set its price low enough to sell proportion α of A-type consumers, and as a result, firm A can sell only proportion $(1-\alpha)$ of A-type consumers. Therefore, if firm A charges $p_A = \frac{(2+\alpha)u_0}{\alpha}$, then $p_B = \frac{2(1+\alpha)u_0}{\alpha}$ and $\pi_{d,A} = \frac{(2+\alpha)u_0}{2\alpha}$, and if it charges $p_A = u_1$, then $p_B = u_1 - u_0$ and $\pi_{d,A} = \frac{u_1(1-\alpha)}{2}$. Since $\frac{(2+\alpha)u_0}{2\alpha} > \frac{u_1(1-\alpha)}{2}$ for $\frac{2u_0(1+\alpha)}{\alpha} < u_1 < \frac{u_0(2+\alpha)}{\alpha(1-\alpha)}$, firm A prefers to charge $p^*_A = \frac{(2+\alpha)u_0}{\alpha}$. In this case, $p^*_B = \frac{2(1+\alpha)u_0}{\alpha}$, $\pi^*_{d,A} = \frac{(2+\alpha)u_0}{2\alpha}$, and $\pi^*_{d,B} = \frac{(1+\alpha)u_0}{\alpha}$.

For $u_1 > \frac{u_0(2+\alpha)}{\alpha(1-\alpha)}$, $\frac{u_1(1-\alpha)}{2} > \frac{(2+\alpha)u_0}{2\alpha}$, and hence, firm A prefers to charge $p^*_A = u_1$. In this case, $p^*_B = u_1 - u_0$, $\pi^*_{d,A} = \frac{u_1(1-\alpha)}{2}$, and $\pi^*_{d,B} = \frac{(1+\alpha)(u_1-u_0)}{2}$.

In summary, under differentiation,

$$\pi^*_{d,B} = \frac{u_1}{2} \qquad \text{if } u_1 < \frac{2u_0(1+\alpha)}{\alpha},$$

$$\pi^*_{d,B} = \frac{(1+\alpha)u_0}{\alpha} \qquad \text{if } \frac{2u_0(1+\alpha)}{\alpha} < u_1 < \frac{u_0(2+\alpha)}{\alpha(1-\alpha)},$$

and

$$\pi^*_{d,B} = \frac{(1+\alpha)(u_1-u_0)}{2} \qquad \text{if } u_1 > \frac{u_0(2+\alpha)}{\alpha(1-\alpha)}.$$

Result. For $u_1 < 2u_0(1+\alpha)$, $\pi^*_{i,B} = \frac{\alpha u_1}{2} < \pi^*_{d,B} = \frac{u_1}{2}$. For $2u_0(1+\alpha) < u_1 < \frac{2u_0(1+\alpha)}{\alpha}$, $\pi^*_{i,B} = u_0(1+\alpha)\alpha < \pi^*_{d,B} = \frac{u_1}{2}$. For $\frac{2u_0(1+\alpha)}{\alpha} < u_1 < \frac{u_0(2+\alpha)}{\alpha(1-\alpha)}$, $\pi^*_{i,B} = u_0(1+\alpha)\alpha < \pi^*_{d,B} = \frac{(1+\alpha)u_0}{\alpha}$. For $u_1 > \frac{u_0(2+\alpha)}{\alpha(1-\alpha)}$, $\pi^*_{i,B} = u_0(1+\alpha)\alpha < \pi^*_{d,B} = \frac{(1+\alpha)(u_1-u_0)}{2}$. □

Proof of Proposition 2. By following the same logic of the proof of Proposition 1 and using the consumer utility functions given in Table A.3, under imitation, $\pi^*_{i,A} = \frac{u_1(3+2\gamma+\lambda)}{6(1+\gamma)}$ and $\pi^*_{i,B} = \frac{u_1(3+2\gamma+\lambda)\alpha}{6(1+\gamma)}$ for $u_1 < u_0(1+\alpha)$, $\pi^*_{i,A} = \left(\frac{u_1(3+2\gamma+\lambda)\alpha}{3(1+\gamma)(1+\alpha)} + \frac{u_0(3+2\gamma+\lambda)}{3(1+\gamma)}\right)\frac{1}{2}$ and $\pi^*_{i,B} = \frac{u_1(3+2\gamma+\lambda)\alpha}{6(1+\gamma)}$ for $u_0(1+\alpha) < u_1 < 2u_0(1+\alpha)$, and $\pi^*_{i,A} = \frac{u_0(3+2\gamma+\lambda)}{6(1+\gamma)}(1+2\alpha)$ and $\pi^*_{i,B} = \frac{u_0(3+2\gamma+\lambda)}{3(1+\gamma)}(1+\alpha)\alpha$ for $2u_0(1+\alpha) < u_1$.

Using the consumer utility functions given in Table A.4, under differentiation,

$$\pi^*_{d,A} = \pi^*_{d,B} = \frac{u_1(3+2\lambda+\gamma)}{6(1+\gamma)} \qquad \text{for } u_1 < \frac{u_0(3+2\gamma+\lambda)(1+\alpha)}{\alpha(3+2\lambda+\gamma)},$$

$$\pi^*_{d,A} = \left(\frac{u_1(3+2\lambda+\gamma)}{3(1+\gamma)(1+\alpha)} + \frac{u_0(3+2\gamma+\lambda)}{3(1+\gamma)}\right)\frac{1}{2},$$

Table A.3 Consumers' Utility Functions in the Presence of Context-Dependent Preferences When Firm B Imitates

Function	Base utility	Gain utility	Loss utility
$u^{A_1}_{(A,\cdot)}$	$u_0+u_1-p_A$	$\lambda\frac{u_0}{3}+\lambda\frac{u_1}{3}$	$-\gamma p_A$
$u^{B_1}_{(A,\cdot)}$	u_1-p_B	$\lambda\frac{u_1}{3}$	$-\gamma\frac{2u_0}{3}-\gamma p_B$
$u^{A_0}_{(A,\cdot)}$	u_0	$\lambda\frac{u_0}{3}$	$-\gamma\frac{2u_1}{3}$
$u^{B_1}_{(B,b)}$	$u_0+u_1-p_B$	$\lambda\frac{u_0}{3}+\lambda\frac{u_1}{3}$	$-\gamma p_B$
$u^{B_1}_{(B,n)}$	u_0-p_B	$\lambda\frac{u_0}{3}$	$-\gamma p_B$
$u^{A_1}_{(B,b)}$	u_1-p_A	$\lambda\frac{u_1}{3}$	$-\gamma\frac{2u_0}{3}-\gamma p_A$
$u^{A_1}_{(B,n)}$	$-p_A$		$-\gamma\frac{2u_0}{3}-\gamma p_A$
$u^{B_0}_{(B,b)}$	u_0	$\lambda\frac{u_0}{3}$	$-\gamma\frac{2u_1}{3}$
$u^{B_0}_{(B,n)}$	u_0	$\lambda\frac{u_0}{3}$	

and

$$\pi^*_{d,B}=\frac{u_1(3+2\lambda+\gamma)}{6(1+\gamma)}\quad\text{for } \frac{u_0(3+2\gamma+\lambda)(1+\alpha)}{\alpha(3+2\lambda+\gamma)}<u_1<\frac{2u_0(3+2\gamma+\lambda)(1+\alpha)}{\alpha(3+2\lambda+\gamma)},$$

$$\pi^*_{d,A}=\frac{u_0(3+2\gamma+\lambda)}{6(1+\gamma)}\frac{2+\alpha}{\alpha}$$

and

$$\pi^*_{d,B}=\frac{u_0(3+2\gamma+\lambda)}{3(1+\gamma)}\frac{1+\alpha}{\alpha}\quad\text{for } \frac{2u_0(3+2\gamma+\lambda)(1+\alpha)}{\alpha(3+2\lambda+\gamma)}<u_1<\frac{u_0(3+2\gamma+\lambda)(2+\alpha)}{\alpha(1-\alpha)(3+2\lambda+\gamma)},$$

$$\pi^*_{d,A}=\frac{u_1(3+2\lambda+\gamma)(1-\alpha)}{6(1+\gamma)}$$

and

$$\pi^*_{d,B}=\left(\frac{u_1(3+2\lambda+\gamma)}{3(1+\gamma)}-\frac{u_0(3+2\gamma+\lambda)}{3(1+\gamma)}\right)\frac{1+\alpha}{2}\quad\text{for } \frac{u_0(3+2\gamma+\lambda)(2+\alpha)}{\alpha(1-\alpha)(3+2\lambda+\gamma)}<u_1.$$

By comparing firm B's payoffs under imitation and differentiation, one can see that $\pi^*_{i,B}>\pi^*_{d,B}$ only if $\alpha>\frac{3+2\lambda+\gamma}{3+2\gamma+\lambda}$ and $u_1<\frac{2u_0(3+2\gamma+\lambda)(1+\alpha)\alpha}{(3+2\lambda+\gamma)}$. Let $\alpha^*=\frac{3+2\lambda+\gamma}{3+2\gamma+\lambda}$ and $u_1^*=\frac{2u_0(3+2\gamma+\lambda)(1+\alpha)\alpha}{(3+2\lambda+\gamma)}$. Therefore, firm B prefers to imitate only if $\alpha>\alpha^*$ and $u_1<u_1^*$. □

Proof of Proposition 3. By following the same logic of the proof of Proposition 1 and using the consumer utility functions given in Table A.5, under imitation,

Table A.4 Consumers' Utility Functions in the Presence of Context-Dependent Preferences When Firm B Differentiates

Function	Base utility	Gain utility	Loss utility
$u^{A_1}_{(A,n)}$	$u_0+u_1-p_A$	$\lambda\frac{u_0}{3}+\lambda\frac{2u_1}{3}$	$-\gamma p_A$
$u^{A_1}_{(A,b)}$	$u_0+u_1-p_A$	$\lambda\frac{u_0}{3}+\lambda\frac{2u_1}{3}$	$-\gamma\frac{u_1}{3}-\gamma p_A$
$u^{B_1}_{(A,b)}$	u_1-p_B	$\lambda\frac{2u_1}{3}$	$-\gamma\frac{2u_0}{3}-\gamma\frac{u_1}{3}-\gamma p_B$
$u^{B_1}_{(A,n)}$	$-p_B$		$-\gamma\frac{2u_0}{3}-\gamma\frac{u_1}{3}-\gamma p_B$
$u^{A_0}_{(A,n)}$	u_0	$\lambda\frac{u_0}{3}$	$-\gamma\frac{u_1}{3}$
$u^{A_0}_{(A,b)}$	u_0	$\lambda\frac{u_0}{3}$	$-\gamma\frac{2u_1}{3}$
$u^{B_1}_{(B,n)}$	$u_0+u_1-p_B$	$\lambda\frac{u_0}{3}+\lambda\frac{2u_1}{3}$	$-\gamma p_B$
$u^{B_1}_{(B,b)}$	$u_0+u_1-p_B$	$\lambda\frac{u_0}{3}+\lambda\frac{2u_1}{3}$	$-\gamma\frac{u_1}{3}-\gamma p_B$
$u^{A_1}_{(B,b)}$	u_1-p_A	$\lambda\frac{2u_1}{3}$	$-\gamma\frac{2u_0}{3}-\gamma\frac{u_1}{3}-\gamma p_B$
$u^{A_1}_{(B,n)}$	$-p_A$		$-\gamma\frac{2u_0}{3}-\gamma\frac{u_1}{3}-\gamma p_B$
$u^{B_0}_{(B,n)}$	u_0	$\lambda\frac{u_0}{3}$	$-\gamma\frac{u_1}{3}$
$u^{B_0}_{(B,b)}$	u_0	$\lambda\frac{u_0}{3}$	$-\gamma\frac{2u_1}{3}$

$$\pi^*_{i,A}=\frac{u_1(3+2\gamma+\lambda)}{6(1+\gamma)}\quad\text{and}\quad\pi^*_{i,B}=\frac{u_1(3+2\gamma+\lambda)\alpha}{6(1+\gamma)}\quad\text{for } u_1<u_0(1+\alpha)(1-\rho),$$

$$\pi^*_{i,A}=\left(\frac{u_1(3+2\gamma+\lambda)\alpha}{3(1+\gamma)(1+\alpha)}+\frac{u_0(3+2\gamma+\lambda)(1-\rho)}{3(1+\gamma)}\right)\frac{1}{2}\quad\text{and}$$

$$\pi^*_{i,B}=\frac{u_1(3+2\gamma+\lambda)\alpha}{6(1+\gamma)}\quad\text{for } u_0(1+\alpha)(1-\rho)<u_1<2u_0(1+\alpha)(1-\rho),$$

and $\pi^*_{i,A}=\frac{u_0(3+2\gamma+\lambda)}{6(1+\gamma)}(1+2\alpha)(1-\rho)$ and $\pi^*_{i,B}=\frac{u_0(3+2\gamma+\lambda)}{3(1+\gamma)}\cdot(1+\alpha)\alpha(1-\rho)$ for $2u_0(1+\alpha)(1-\rho)<u_1$.

Under differentiation,

$$\pi^*_{d,A}=\pi^*_{d,B}=\frac{u_1(3+2\lambda+\gamma)}{6(1+\gamma)}\quad\text{for } u_1<\frac{u_0(3+2\gamma+\lambda)(1+\alpha)(1-\rho)}{\alpha(3+2\lambda+\gamma)},$$

$$\pi^*_{d,A}=\left(\frac{u_1(3+2\lambda+\gamma)}{3(1+\gamma)(1+\alpha)}+\frac{u_0(3+2\gamma+\lambda)}{3(1+\gamma)}(1-\rho)\right)\frac{1}{2}$$

and

$$\pi^*_{d,B}=\frac{u_1(3+2\lambda+\gamma)}{6(1+\gamma)}\quad\text{for } \frac{u_0(3+2\gamma+\lambda)(1+\alpha)(1-\rho)}{\alpha(3+2\lambda+\gamma)}<u_1<\frac{2u_0(3+2\gamma+\lambda)(1+\alpha)(1-\rho)}{\alpha(3+2\lambda+\gamma)},$$

Table A.5 Consumers' Utility Functions When Brands Are Ex Ante Not Maximally Differentiated from Each Other

If firm B chooses to imitate	If firm B chooses to differentiate
$u^{A_1}_{(A,\cdot)} = u_0 + u_1 + \lambda\frac{(1-\rho)u_0}{3} + \lambda\frac{u_1}{3} - (1+\gamma)p_A$	$u^{A_1}_{(A,n)} = u_0+u_1+\lambda\frac{(1-\rho)u_0}{3}+\lambda\frac{2u_1}{3}-(1+\gamma)p_A$
$u^{B_1}_{(A,\cdot)} = \rho u_0 + u_1 + \lambda\frac{u_1}{3} - \gamma\frac{2(1-\rho)u_0}{3} - (1+\gamma)p_B$	$u^{A_1}_{(A,b)} = u_0+u_1+\lambda\frac{(1-\rho)u_0}{3}+\lambda\frac{2u_1}{3}-\gamma\frac{u_1}{3}-(1+\gamma)p_A$
$u^{A_0}_{(A,\cdot)} = u_0 + \lambda\frac{(1-\rho)u_0}{3} - \gamma\frac{2u_1}{3}$	$u^{B_1}_{(A,b)} = \rho u_0+u_1+\lambda\frac{2u_1}{3}-\gamma\frac{u_1}{3}-\gamma\frac{2(1-\rho)u_0}{3}-(1+\gamma)p_B$
$u^{B_1}_{(B,b)} = u_0+u_1+\lambda\frac{(1-\rho)u_0}{3}+\lambda\frac{u_1}{3}-(1+\gamma)p_B$	$u^{B_1}_{(A,n)} = \rho u_0-\gamma\frac{2(1-\rho)u_0}{3}-\gamma\frac{u_1}{3}-(1+\gamma)p_B$
$u^{B_1}_{(B,n)} = u_0+\lambda\frac{(1-\rho)u_0}{3}-(1+\gamma)p_B$	$u^{A_0}_{(A,n)} = u_0+\lambda\frac{(1-\rho)u_0}{3}-\gamma\frac{u_1}{3}$
$u^{A_1}_{(B,b)} = \rho u_0+u_1+\lambda\frac{u_1}{3}-\gamma\frac{2(1-\rho)u_0}{3}-(1+\gamma)p_A$	$u^{A_0}_{(A,b)} = u_0+\lambda\frac{(1-\rho)u_0}{3}-\gamma\frac{2u_1}{3}$
$u^{A_1}_{(B,n)} = \rho u_0 - \gamma\frac{2(1-\rho)u_0}{3}-(1+\gamma)p_A$	$u^{B_1}_{(B,n)} = u_0+u_1+\lambda\frac{(1-\rho)u_0}{3}+\lambda\frac{2u_1}{3}-(1+\gamma)p_B$
$u^{B_0}_{(B,n)} = u_0+\lambda\frac{(1-\rho)u_0}{3}$	$u^{B_1}_{(B,b)} = u_0+u_1+\lambda\frac{(1-\rho)u_0}{3}+\lambda\frac{2u_1}{3}-\gamma\frac{u_1}{3}-(1+\gamma)p_B$
$u^{B_0}_{(B,b)} = u_0+\lambda\frac{(1-\rho)u_0}{3}-\gamma\frac{2u_1}{3}$	$u^{A_1}_{(B,b)} = \rho u_0+u_1+\lambda\frac{2u_1}{3}-\gamma\frac{u_1}{3}-\gamma\frac{2(1-\rho)u_0}{3}-(1+\gamma)p_A$
	$u^{A_1}_{(B,n)} = \rho u_0-\gamma\frac{2(1-\rho)u_0}{3}-\gamma\frac{u_1}{3}-(1+\gamma)p_A$
	$u^{B_0}_{(B,n)} = u_0+\lambda\frac{(1-\rho)u_0}{3}-\gamma\frac{u_1}{3}$
	$u^{B_0}_{(B,b)} = u_0+\lambda\frac{(1-\rho)u_0}{3}-\gamma\frac{2u_1}{3}$

$$\pi^*_{d,A} = \frac{u_0(3+2\gamma+\lambda)}{6(1+\gamma)}\frac{(2+\alpha)}{\alpha}(1-\rho)$$

and

$$\pi^*_{d,B} = \frac{u_0(3+2\gamma+\lambda)}{3(1+\gamma)}\frac{(1+\alpha)}{\alpha}(1-\rho)$$

$$\text{for } \frac{2u_0(3+2\gamma+\lambda)(1+\alpha)(1-\rho)}{\alpha(3+2\lambda+\gamma)} < u_1 < \frac{u_0(3+2\gamma+\lambda)(2+\alpha)(1-\rho)}{\alpha(1-\alpha)(3+2\lambda+\gamma)},$$

$$\pi^*_{d,A} = \frac{u_1(3+2\lambda+\gamma)(1-\alpha)}{6(1+\gamma)}$$

and

$$\pi^*_{d,B} = \left(\frac{u_1(3+2\lambda+\gamma)}{3(1+\gamma)} - \frac{u_0(3+2\gamma+\lambda)}{3(1+\gamma)}(1-\rho)\right)\frac{(1+\alpha)}{2}$$

$$\text{for } \frac{u_0(3+2\gamma+\lambda)(2+\alpha)(1-\rho)}{\alpha(1-\alpha)(3+2\lambda+\gamma)} < u_1.$$

By comparing firm B's payoffs under imitation and differentiation, one can see that $\pi^*_{i,B} > \pi^*_{d,B}$ only if $\alpha > \alpha^* = \frac{3+2\lambda+\gamma}{3+2\gamma+\lambda}$ and $u_1 < \frac{2u_0(3+2\gamma+\lambda)(1+\alpha)\alpha(1-\rho)}{(3+2\lambda+\gamma)}$, where $\frac{2u_0(3+2\gamma+\lambda)(1+\alpha)\alpha(1-\rho)}{(3+2\lambda+\gamma)} = u_1^*(1-\rho)$.

Note that because α is a function of ρ if for small ρ-values α is less than $\frac{3+2\lambda+\gamma}{3+2\gamma+\lambda}$, firm B would not even consider imitation. Thus, if $\frac{\partial(\alpha(1+\alpha)(1-\rho))}{\partial\rho} > 0$ for ρ-values such that $\alpha(\rho) > \frac{3+2\lambda+\gamma}{3+2\gamma+\lambda}$, it means that the region in which firm B prefers to imitate expands as ρ increases. Note that $\frac{\partial(\alpha(1+\alpha)(1-\rho))}{\partial\rho} > 0$ if $1 - \frac{\alpha(1+\alpha)}{\alpha'(1+2\alpha)} > \rho$. In the following we will show by an example that there exist small enough ρ-values such that $\frac{\partial(\alpha(1+\alpha)(1-\rho))}{\partial\rho} > 0$ and $\alpha(\rho) > \frac{3+2\lambda+\gamma}{3+2\gamma+\lambda}$. Let $\alpha = \frac{1+\rho}{2}$. It is obvious that $1 - \frac{\alpha(1+\alpha)}{\alpha'(1+2\alpha)} > \rho$ as long as $\rho < 0.155$. Given that $\alpha(\rho \leq 0.155) \leq 0.58$, for high enough γ-values (i.e., γ must be higher than $(7.8+8.8\lambda)$), $\alpha(\rho < 0.155)$ would be higher than $\frac{3+2\lambda+\gamma}{3+2\gamma+\lambda}$. □

Proof of Proposition 4. By following the same logic of the proof of Proposition 1 and using the consumer utility functions given in Table A.3, under imitation,

$$\pi^*_{i,A} = \frac{u_1(3+2\gamma+\lambda)(1+n)}{6(1+\gamma)}$$

and

$$\pi^*_{i,B} = \frac{u_1(3+2\gamma+\lambda)(1-n)\alpha}{6(1+\gamma)}$$

$$\text{for } u_1 < \frac{u_0(1+\alpha+n(1-\alpha))}{(1+n)},$$

$$\pi^*_{i,A} = \left(\frac{u_1(3+2\gamma+\lambda)\alpha(1-n)}{3(1+\gamma)(1+\alpha+n(1-\alpha))} + \frac{u_0(3+2\gamma+\lambda)}{3(1+\gamma)}\right)\frac{1+n}{2}$$

and

$$\pi^*_{i,B} = \frac{u_1(3+2\gamma+\lambda)(1-n)\alpha}{6(1+\gamma)}$$

$$\text{for } \frac{u_0(1+\alpha+n(1-\alpha))}{(1+n)} < u_1 < \frac{2u_0(1+\alpha+n(1-\alpha))}{(1+n)},$$

$$\pi^*_{i,A} = \frac{u_0(3+2\gamma+\lambda)(1+2\alpha+n(1-2\alpha))}{6(1+\gamma)}$$

and

$$\pi^*_{i,B} = \frac{u_0(3+2\gamma+\lambda)}{3(1+\gamma)}\frac{(1+\alpha+n(1-\alpha))(1-n)\alpha}{1+n} \quad \text{for } \frac{2u_0(1+\alpha+n(1-\alpha))}{(1+n)} < u_1.$$

Using the consumer utility functions given in Table A. 4, under differentiation,

$$\pi^*_{d,A} = \frac{u_1(3+2\lambda+\gamma)(1+n)}{6(1+\gamma)}$$

and

$$\pi^*_{d,B} = \frac{u_1(3+2\lambda+\gamma)(1-n)}{6(1+\gamma)} \quad \text{for } u_1 < \frac{u_0(3+2\gamma+\lambda)(1+\alpha-n(1-\alpha))}{\alpha(1+n)(3+2\lambda+\gamma)}.$$

If $\alpha > \frac{2n}{1+n}$,

$$\pi^*_{d,A} = \left(\frac{u_1(3+2\lambda+\gamma)(1-n)}{3(1+\gamma)(1+\alpha-n(1-\alpha))} + \frac{u_0(3+2\gamma+\lambda)}{3(1+\gamma)}\right)\frac{(1+n)}{2}$$

and

$$\pi^*_{d,B} = \frac{u_1(3+2\lambda+\gamma)(1-n)}{6(1+\gamma)} \quad \text{for } \frac{u_0(3+2\gamma+\lambda)(1+\alpha-n(1-\alpha))}{\alpha(1+n)(3+2\lambda+\gamma)} < u_1 < \frac{2u_0(3+2\gamma+\lambda)(1+\alpha-n(1-\alpha))}{\alpha(1+n)(3+2\lambda+\gamma)},$$

$$\pi^*_{d,A} = \frac{u_0(3+2\gamma+\lambda)}{6(1+\gamma)}\frac{(2(1-n)+\alpha(1+n))}{\alpha}$$

and

$$\pi^*_{d,B} = \frac{u_0(3+2\gamma+\lambda)}{3(1+\gamma)}\frac{(1+\alpha-n(1-\alpha))(1-n)}{\alpha(1+n)} \quad \text{for } \frac{2u_0(3+2\gamma+\lambda)(1+\alpha-n(1-\alpha))}{\alpha(1+n)(3+2\lambda+\gamma)} < u_1 < \frac{u_0(3+2\gamma+\lambda)(2+\alpha-n(2-\alpha))}{\alpha(1-\alpha)(1+n)(3+2\lambda+\gamma)},$$

$$\pi^*_{d,A} = \frac{u_1(3+2\lambda+\gamma)(1-\alpha)(1+n)}{6(1+\gamma)}$$

and

$$\pi^*_{d,B} = \left(\frac{u_1(3+2\lambda+\gamma)}{3(1+\gamma)} - \frac{u_0(3+2\gamma+\lambda)}{3(1+\gamma)}\right)\frac{1+\alpha-n(1-\alpha)}{2} \quad \text{for } \frac{u_0(3+2\gamma+\lambda)(2+\alpha-n(2-\alpha))}{\alpha(1-\alpha)(1+n)(3+2\lambda+\gamma)} < u_1.$$

If $\alpha < \frac{2n}{1+n}$,

$$\pi^*_{d,A} = \left(\frac{u_1(3+2\gamma+\lambda)(1-n)}{3(1+\gamma)(1+\alpha-n(1-\alpha))} + \frac{u_0(3+2\gamma+\lambda)}{3(1+\gamma)}\right)\frac{1+n}{2}$$

and

$$\pi^*_{d,B} = \frac{u_1(3+2\lambda+\gamma)(1-n)}{6(1+\gamma)} \quad \text{for } \frac{u_0(3+2\gamma+\lambda)(1+\alpha-n(1-\alpha))}{\alpha(1+n)(3+2\lambda+\gamma)} < u_1 < \frac{u_0(3+2\gamma+\lambda)(1+\alpha-n(1-\alpha))}{\alpha(2n-\alpha(1+n))(3+2\lambda+\gamma)},$$

$$\pi^*_{d,A} = \frac{u_1(3+2\lambda+\gamma)(1-\alpha)(1+n)}{6(1+\gamma)}$$

and

$$\pi^*_{d,B} = \left(\frac{u_1(3+2\lambda+\gamma)}{3(1+\gamma)} - \frac{u_0(3+2\gamma+\lambda)}{3(1+\gamma)}\right)\frac{(1+\alpha-n(1-\alpha))}{2} \quad \text{for } \frac{u_0(3+2\gamma+\lambda)(1+\alpha-n(1-\alpha))}{\alpha(2n-\alpha(1+n))(3+2\lambda+\gamma)} < u_1.$$

By comparing firm B's payoffs under imitation and differentiation, $\pi^*_{i,B} > \pi^*_{d,B}$ if $\alpha > \max\{\frac{2n}{1+n}, \frac{3+2\lambda+\gamma}{3+2\gamma+\lambda}\}$ and $u_1 < \frac{2u_0(3+2\gamma+\lambda)(1+\alpha+n(1-\alpha))\alpha}{(3+2\lambda+\gamma)(1+n)}$ or if $\frac{3+2\lambda+\gamma}{3+2\gamma+\lambda} < \alpha < \frac{2n}{1+n}$, $u_1 < \min\{\frac{2u_0(3+2\gamma+\lambda)(1+\alpha+n(1-\alpha))\alpha}{(3+2\lambda+\gamma)(1+n)}, \frac{u_0(3+2\gamma+\lambda)(1+\alpha-n(1-\alpha))}{\alpha(2n-\alpha(1+n))(3+2\lambda+\gamma)}\}$. Therefore, if $\alpha < \frac{3+2\lambda+\gamma}{3+2\gamma+\lambda}$, then firm B would never prefer to imitate. Note that $\frac{2u_0(3+2\gamma+\lambda)(1+\alpha+n(1-\alpha))\alpha}{(3+2\lambda+\gamma)(1+n)} < u_1^*$.

Let $\hat{u}_1 = \frac{2u_0(3+2\gamma+\lambda)(1+\alpha+n(1-\alpha))\alpha}{(3+2\lambda+\gamma)(1+n)}$ if $\alpha > \max\{\frac{2n}{1+n}, \frac{3+2\lambda+\gamma}{3+2\gamma+\lambda}\}$, $\hat{u}_1 = \min\{\frac{2u_0(3+2\gamma+\lambda)(1+\alpha+n(1-\alpha))\alpha}{(3+2\lambda+\gamma)(1+n)}, \frac{u_0(3+2\gamma+\lambda)(1+\alpha-n(1-\alpha))}{\alpha(2n-\alpha(1+n))(3+2\lambda+\gamma)}\}$ if $\frac{3+2\lambda+\gamma}{3+2\gamma+\lambda} < \alpha < \frac{2n}{1+n}$. Therefore, firm B prefers to imitate only if $\alpha > \alpha^*$ and $u_1 < \hat{u}_1$.

Recall that firm A is the dominant firm if $n > 0$ and firm B is the dominant firm otherwise. By looking at the conditions derived above, u_1 must be less than $\frac{2u_0(3+2\gamma+\lambda)(1+\alpha+n(1-\alpha))\alpha}{(3+2\lambda+\gamma)(1+n)}$ for firm B to imitate. Since $\frac{1+\alpha+m(1-\alpha)}{1+m} < \frac{1+\alpha-m(1-\alpha)}{1-m}$ $\forall m \in [0,1]$, and for $n < 0$, the binding condition for firm B to imitate is $u_1 < \frac{2u_0(3+2\gamma+\lambda)(1+\alpha+n(1-\alpha))\alpha}{(3+2\lambda+\gamma)(1+n)}$, the region in which firm B prefers to imitate is bigger when firm B is the dominant firm than when firm B is the dominated firm. Therefore, firm B has more incentive to imitate when it is the dominant firm. □

Proof of Proposition 5. *Without context-dependent preferences.* Obviously, when firm A develops f_2, imitation is not a viable option. When firm A develops f_1, firm B can choose one of the following three strategies: (1) imitate, (2) differentiate by developing an f_1-type new feature, or (3) differentiate by developing an f_2-type new feature. From the proof of Proposition 1, if firm B pursues strategy 1, then $\pi^*_{i,B} = u_1/2$ for $u_1 < 4u_0$ and $\pi^*_{i,B} = 2u_0$ otherwise. If firm B follows strategy 2, then $\pi^*_{i,B} = \frac{u_1}{2}$ for $u_1 < 4u_0$ and $\pi^*_{i,B} = 2u_0$, otherwise. If firm B pursues strategy 3 because none of the A-type consumers would like firm B's new feature, both firms would be able to charge monopoly prices. In this case, $\pi^*_{d,A} = \pi^*_{d,B} = u_1/2$. Therefore, firm B would never strongly prefer imitation over differentiation, and it is better off pursuing strategy 3.

With context-dependent preferences. When firm A chooses to develop f_1, firm B can choose one the following three strategies: (1) imitate, (2) differentiate by developing an f_1-type new feature, or (3) differentiate by developing an f_2-type new feature. We also know from the proof of Proposition 2 that if firm B imitates, by setting α equal to 1, $\pi^*_{i,A} = \pi^*_{i,B} = \frac{u_1(3+2\gamma+\lambda)}{6(1+\gamma)}$ for $u_1 < 2u_0$, $\pi^*_{i,A} = (\frac{u_1(3+2\gamma+\lambda)}{6(1+\gamma)} + \frac{(3+2\gamma+\lambda)u_0}{3(1+\gamma)})\frac{1}{2}$ and $\pi^*_{i,B} = \frac{u_1(3+2\gamma+\lambda)}{6(1+\gamma)}$ for $2u_0 < u_1 < 4u_0$, and $\pi^*_{i,A} = \frac{(3+2\gamma+\lambda)u_0}{2(1+\gamma)}$ and $\pi^*_{i,B} = \frac{2(3+2\gamma+\lambda)u_0}{3(1+\gamma)}$ for $4u_0 < u_1$. If firm B pursues strategy 2, from the proof of Proposition 2, by setting α equal to 1, $\pi^*_{d,A} = \pi^*_{d,B} = \frac{u_1(3+2\lambda+\gamma)}{6(1+\gamma)}$ for $u_1 < \frac{2u_0(3+2\gamma+\lambda)}{(3+2\lambda+\gamma)}$, $\pi^*_{d,A} = (\frac{u_1(3+2\lambda+\gamma)}{6(1+\gamma)} + \frac{(3+2\gamma+\lambda)u_0}{3(1+\gamma)})\frac{1}{2}$ and $\pi^*_{d,B} = \frac{u_1(3+2\lambda+\gamma)}{6(1+\gamma)}$ for $\frac{2u_0(3+2\gamma+\lambda)}{(3+2\lambda+\gamma)} < u_1 < \frac{4u_0(3+2\gamma+\lambda)}{(3+2\lambda+\gamma)}$, and $\pi^*_{d,A} = \frac{(3+2\gamma+\lambda)u_0}{2(1+\gamma)}$ and $\pi^*_{d,B} = \frac{2(3+2\gamma+\lambda)u_0}{3(1+\gamma)}$ for $\frac{4u_0(3+2\gamma+\lambda)}{(3+2\lambda+\gamma)} < u_1$. If firm B pursues strategy 3, because none of the A-type consumers would like B_1, firm A sets its price equal to $p^*_A = \frac{u_1(3+2\lambda+\gamma)}{3(1+\gamma)}$ and firm B sets its price to $p^*_B = \frac{u_1(3+2\lambda+\gamma)}{3(1+\gamma)}$; hence, $\pi^*_{d,A} = \pi^*_{d,B} = \frac{u_1(3+2\lambda+\gamma)}{6(1+\gamma)}$ $\forall u_1$. Therefore, by comparing the profits under three strategies, one can see that $\pi^*_{i,B} > \pi^*_{d,B}$ only if $u_1 < \frac{4u_0(3+2\gamma+\lambda)}{(3+2\lambda+\gamma)}$, where $u^*_1(\alpha = 1) = \frac{4u_0(3+2\gamma+\lambda)}{(3+2\lambda+\gamma)}$. □

Proof of Proposition 6. If firm A develops f_2, imitation would not be feasible and firm B would differentiate by developing either an f_1-type new feature or an f_2-type new feature. If firm B differentiates by developing an f_2-type new feature, because A-type consumers would not be willing to buy B_1 and B-type consumers would not be willing to buy A_1, $p^*_A = p^*_B = \frac{u_1(3+2\lambda+\gamma)}{3(1+\gamma)}$ and $\pi^*_{d,A} = \pi^*_{d,B} = \frac{u_1(3+2\lambda+\gamma)}{6(1+\gamma)}$ $\forall u_1$. On the other hand, if firm B develops an f_1-type new feature, $\pi^*_{d,A} = \pi^*_{d,B} = \frac{u_1(3+2\lambda+\gamma)}{6(1+\gamma)}$ for $u_1 < \frac{2u_0(3+2\gamma+\lambda)}{(3+2\lambda+\gamma)}$, and $\pi^*_{d,A} = (\frac{u_1(3+2\lambda+\gamma)}{6(1+\gamma)} + \frac{(3+2\gamma+\lambda)u_0}{3(1+\gamma)})\frac{1}{2}$ and $\pi^*_{d,B} = \frac{u_1(3+2\lambda+\gamma)}{6(1+\gamma)}$ for $\frac{2u_0(3+2\gamma+\lambda)}{(3+2\lambda+\gamma)} < u_1 < \frac{4u_0(3+2\gamma+\lambda)}{(3+2\lambda+\gamma)}$.

Recall from the proof of Proposition 5 that if firm A develops f_1, then $\pi^*_{i,A} = \frac{u_1(3+2\gamma+\lambda)}{6(1+\gamma)}$ for $u_1 < 2u_0$, $\pi^*_{i,A} = (\frac{u_1(3+2\gamma+\lambda)}{6(1+\gamma)} + \frac{(3+2\gamma+\lambda)u_0}{3(1+\gamma)})\frac{1}{2}$ for $2u_0 < u_1 < 4u_0$, and $\pi^*_{i,A} = \frac{(3+2\gamma+\lambda)u_0}{2(1+\gamma)}$ for $4u_0 < u_1$. By comparing the profits when firm A develops f_1 and firm B imitates with the profits when firm A develops f_2 and firm B differentiates by developing an f_1-type new feature, $\pi^*_{i,A} > \pi^*_{d,A}$ $\forall u_1 < \frac{4u_0(3+2\gamma+\lambda)}{(3+2\lambda+\gamma)}$. However, by comparing the profits when firm A develops f_1 and firm B imitates with the profits when firm A develops f_2 and firm B differentiates by developing an f_2-type new feature, $\pi^*_{i,A} > \pi^*_{d,A}$ for $\gamma > \frac{3+5\lambda}{2}$ and $u_1 < \frac{3u_0(3+2\gamma+\lambda)}{(3+2\lambda+\gamma)}$ or $\gamma < \frac{3+5\lambda}{2}$ and $u_1 < \frac{2u_0(3+2\gamma+\lambda)}{3(1+\lambda)}$. Note that $\frac{3u_0(3+2\gamma+\lambda)}{(3+2\lambda+\gamma)} < \frac{2u_0(3+2\gamma+\lambda)}{3(1+\lambda)}$ if $\gamma > \frac{3+5\lambda}{2}$ and $\frac{3u_0(3+2\gamma+\lambda)}{(3+2\lambda+\gamma)} > \frac{2u_0(3+2\gamma+\lambda)}{3(1+\lambda)}$ otherwise. Therefore, firm A prefers firm B to imitate and hence develops f_1 only for $u_1 < \min\{\frac{3u_0(3+2\gamma+\lambda)}{(3+2\lambda+\gamma)}, \frac{2u_0(3+2\gamma+\lambda)}{3(1+\lambda)}\}$. Let $\tilde{u}_1 = \min\{\frac{3u_0(3+2\gamma+\lambda)}{(3+2\lambda+\gamma)}, \frac{2u_0(3+2\gamma+\lambda)}{3(1+\lambda)}\}$. □

Proof of Proposition 7. If firm A develops f_1 and firm B imitates, then from the proof of Proposition 4, by setting α equal to 1:

$$\pi^*_{i,A} = \frac{u_1(3+2\gamma+\lambda)(1+n)}{6(1+\gamma)}$$

and

$$\pi^*_{i,B} = \frac{u_1(3+2\gamma+\lambda)(1-n)}{6(1+\gamma)} \qquad \text{for } u_1 < \frac{2u_0}{1+n},$$

$$\pi^*_{i,A} = \left(\frac{u_1(3+2\gamma+\lambda)(1-n)}{6(1+\gamma)} + \frac{u_0(3+2\gamma+\lambda)}{3(1+\gamma)}\right)\frac{1+n}{2}$$

and

$$\pi^*_{i,B} = \frac{u_1(3+2\gamma+\lambda)(1-n)}{6(1+\gamma)} \qquad \text{for } \frac{2u_0}{1+n} < u_1 < \frac{4u_0}{1+n},$$

$$\pi^*_{i,A} = \frac{u_0(3+2\gamma+\lambda)(3-n)}{6(1+\gamma)}$$

and

$$\pi^*_{i,B} = \frac{2u_0(3+2\gamma+\lambda)(1-n)}{3(1+\gamma)(1+n)} \qquad \text{for } \frac{4u_0}{1+n} < u_1.$$

If firm A develops f_1 and firm B differentiates by developing an f_1-type new feature, then from the proof of Proposition 4, by setting α equal to 1:

$$\pi^*_{d,A} = \frac{u_1(3+2\lambda+\gamma)(1+n)}{6(1+\gamma)}$$

and

$$\pi^*_{d,B} = \frac{u_1(3+2\lambda+\gamma)(1-n)}{6(1+\gamma)} \qquad \text{for } u_1 < \frac{2u_0(3+2\gamma+\lambda)}{(1+n)(3+2\lambda+\gamma)},$$

$$\pi^*_{d,A} = \left(\frac{u_1(3+2\lambda+\gamma)(1-n)}{6(1+\gamma)} + \frac{u_0(3+2\gamma+\lambda)}{3(1+\gamma)}\right)\frac{1+n}{2}$$

and

$$\pi^*_{d,B} = \frac{u_1(3+2\lambda+\gamma)(1-n)}{6(1+\gamma)}$$
$$\text{for } \frac{2u_0(3+2\gamma+\lambda)}{(1+n)(3+2\lambda+\gamma)} < u_1 < \frac{4u_0(3+2\gamma+\lambda)}{(1+n)(3+2\lambda+\gamma)},$$

$$\pi^*_{d,A} = \frac{u_0(3+2\gamma+\lambda)(3-n)}{6(1+\gamma)}$$

and

$$\pi^*_{d,B} = \frac{2u_0(3+2\gamma+\lambda)(1-n)}{3(1+\gamma)(1+n)} \qquad \text{for } \frac{4u_0(3+2\gamma+\lambda)}{(1+n)(3+2\lambda+\gamma)} < u_1.$$

If firm A develops f_1 and firm B differentiates by developing an f_2-type new feature, because A-type consumers would not be willing to buy B_1, $p^*_A = p^*_B = \frac{u_1(3+2\lambda+\gamma)}{3(1+\gamma)}$, and hence $\pi^*_{d,A} = \frac{u_1(3+2\lambda+\gamma)(1+n)}{6(1+\gamma)}$ and $\pi^*_{d,B} = \frac{u_1(3+2\lambda+\gamma)(1-n)}{6(1+\gamma)}$ $\forall u_1$.

By comparing firm B's profits when firm A develops f_1, firm B prefers to imitate only if $u_1 < \frac{4u_0(3+2\gamma+\lambda)}{(1+n)(3+2\lambda+\gamma)}$, where $\hat{u}_1(\alpha = 1) = \frac{4u_0(3+2\gamma+\lambda)}{(1+n)(3+2\lambda+\gamma)}$.

If firm A develops f_2 and firm B differentiates by developing an f_2-type new feature, because A-type consumers would not be willing to buy B_1 and B-type consumers would not be willing to buy A_1, $p^*_A = p^*_B = \frac{u_1(3+2\lambda+\gamma)}{3(1+\gamma)}$; hence, $\pi^*_{d,A} = \frac{u_1(3+2\lambda+\gamma)(1+n)}{6(1+\gamma)}$ and $\pi^*_{d,B} = \frac{u_1(3+2\lambda+\gamma)(1-n)}{6(1+\gamma)}$ $\forall u_1$.

If firm A develops f_2 and firm B differentiates by developing an f_1-type new feature,

$$\pi^*_{d,A} = \frac{u_1(3+2\lambda+\gamma)(1+n)}{6(1+\gamma)}$$

and

$$\pi^*_{d,B} = \frac{u_1(3+2\lambda+\gamma)(1-n)}{6(1+\gamma)} \qquad \text{for } u_1 < \frac{2u_0(3+2\gamma+\lambda)}{(1+n)(3+2\lambda+\gamma)},$$

$$\pi^*_{d,A} = \left(\frac{u_1(3+2\lambda+\gamma)(1-n)}{6(1+\gamma)} + \frac{u_0(3+2\gamma+\lambda)}{3(1+\gamma)}\right)\frac{1+n}{2}$$

and

$$\pi^*_{d,B} = \frac{u_1(3+2\lambda+\gamma)(1-n)}{6(1+\gamma)}$$
$$\text{for } \frac{2u_0(3+2\gamma+\lambda)}{(1+n)(3+2\lambda+\gamma)} < u_1 < \frac{4u_0(3+2\gamma+\lambda)}{(1+n)(3+2\lambda+\gamma)}.$$

By comparing the profits when firm A develops f_1 and firm B imitates with the profits when firm A develops f_2 and firm B differentiates by developing an f_1-type new feature, $\pi^*_{i,A} > \pi^*_{d,A}$ $\forall u_1 < \frac{4u_0(3+2\gamma+\lambda)}{(3+2\lambda+\gamma)(1+n)}$. However, by comparing the profits when firm A develops f_1 and firm B imitates with the profits when firm A develops f_2 and firm B differentiates by developing an f_2-type new feature,

$$\pi^*_{i,A} > \pi^*_{d,A}$$

$$\text{for } \gamma > \frac{3(1+n)+\lambda(5+n)}{2(1-n)} \text{ and } u_1 < \frac{u_0(3+2\gamma+\lambda)(3-n)}{(3+2\lambda+\gamma)(1+n)}$$

$$\text{or for } \quad \gamma < \frac{3(1+n)+\lambda(5+n)}{2(1-n)} \quad \text{and}$$
$$u_1 < \frac{2u_0(3+2\gamma+\lambda)}{3(1+\lambda)+n(3+2\gamma+\lambda)}.$$

Note that $\frac{u_0(3+2\gamma+\lambda)(3-n)}{(3+2\lambda+\gamma)(1+n)} < \frac{2u_0(3+2\gamma+\lambda)}{3(1+\lambda)+n(3+2\gamma+\lambda)}$ if $\gamma > \frac{3(1+n)+\lambda(5+n)}{2(1-n)}$ and $\frac{u_0(3+2\gamma+\lambda)(3-n)}{(3+2\lambda+\gamma)(1+n)} > \frac{2u_0(3+2\gamma+\lambda)}{3(1+\lambda)+n(3+2\gamma+\lambda)}$ otherwise. Therefore, firm A prefers firm B to imitate and hence, develops f_1 only for

$$u_1 < \min\left\{\frac{u_0(3+2\gamma+\lambda)(3-n)}{(3+2\lambda+\gamma)(1+n)}, \frac{2u_0(3+2\gamma+\lambda)}{3(1+\lambda)+n(3+2\gamma+\lambda)}\right\}.$$

Let $\check{u}_1 = \min\{\frac{u_0(3+2\gamma+\lambda)(3-n)}{(3+2\lambda+\gamma)(1+n)}, \frac{2u_0(3+2\gamma+\lambda)}{3(1+\lambda)+n(3+2\gamma+\lambda)}\}$. Note that $\partial(\frac{u_0(3+2\gamma+\lambda)(3-n)}{(3+2\lambda+\gamma)(1+n)})/\partial n < 0$ and $\partial(\frac{2u_0(3+2\gamma+\lambda)}{3(1+\lambda)+n(3+2\gamma+\lambda)})/\partial n < 0$. Thus, firm A would have more incentive to accommodate imitation if it is the dominated firm (i.e., if $n < 0$). □

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