

Abstract

The purpose of this thesis is to shed light on how product complementarity affects the variety of possible equilibrium outcomes in a vertically differentiated market. Complementarity is not uncommon. Many vertically differentiated goods have value for the consumer as complements, that is only if they are used in combination with other goods which can also be of different qualities (e.g. piano with tuning service, business trip with hotel accommodation, computing platform with web browsing application, etc.).

Complementarity between goods brings an exogenous expense that the consumer must pay on top of the price of any of the goods available in a vertically differentiated market. However, firms are only partially able to compensate consumers for the exogenous expense by charging lower prices. Some might also be prompted to increase the qualities of their goods. Then, however, the general validity of the maximum-differentiation choice cannot be taken for granted as in the classical no-complementarity case. How many firms will have positive market shares and whether they will serve all consumers at equilibrium cannot be decided based only on the distribution of the consumer identification characteristic~(income or taste). By taking this into account, this thesis reveals a set of possible equilibrium outcomes that have been (with few exceptions) mostly omitted in the existing literature.

In the first essay, exogenous expense is modeled as a lump-sum tax imposed on consumer incomes. The aim is to show that the maximum-differentiation principle does not need to be an optimal quality-choice strategy at any size of the exogenous expense. The larger the tax, the lower the ability (income) or willingness (taste-driven valuation) of consumers to pay for a given level of quality. Accordingly, there is a critical size of exogenous expense, above which the entrant with smaller quality choice is forced to increase the quality of its good, in order to keep consumers interested in buying. Hence, its good should not be maximally differentiated from the higher-quality good at equilibrium.

In the second essay, a multi-market setting is introduced in which two complementary types of goods are sold independently by single-product firms but consumed in a fixed one-to-one ratio. That is, any two goods of a different type form a pairwise combination. As a result, the good of each actual entrant could be present in more than one combination. In this new setting it is shown that the well-known maximum-differentiation principle could take a new form. Specifically, firms prefer to choose prices at which the so called "mixed-quality combinations", consisting of one high-quality good and one low-quality good each, remain unsold.

In the third essay, again a dual-market setting is analyzed, but one of the firms is assumed to be a potential entrant in both markets. It could face competition from a potential superior-quality entrant in one of the markets, and from a potential inferior-quality entrant in the other market. The aim is to check if, at equilibrium, the multi-market entrant could effectively deter entry in either of the two markets by selling its goods only together in a bundle. The results imply that, on the one hand, the entry of the superior-quality entrant should never be excluded, as long as it could enhance the quality of the multi-product firm's bundle, because both firms would then gain. On the other hand, the entry of the inferior-quality entrant can be deterred via bundling. However, the entry-deterrence outcome at equilibrium appears to depend in the first place on the variability of consumer tastes and the quality differentiation of the available combinations, rather than on the pricing or bundling strategies of the multi-product firm.