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**How do institutional actors in the financial market assess
companies' product design? The quasi-rational evaluative schemes**

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ABSTRACT

While various strategic business issues related to product design have been explored by academicians and practitioners, one issue has largely been ignored: How do financial markets assess and evaluate companies' product design? The purpose of this article is to examine this issue, especially when it comes to the assessments and evaluations made by the most essential actors of contemporary financial markets: investment analysts and institutional investors. We develop propositions concerning the product design-related evaluative schemes and heuristics used by the financial market actors in evaluating companies as investment opportunities. We illustrate our propositions with examples from e.g. the mobile phone industry as well as with interview excerpts from interviews with investment analysts and institutional investors. Propositions are provided both for assessments of companies' individual end products ('design as the end product' perspective) and for assessments of companies' design capabilities ('design as a capability' perspective). In essence, our propositions highlight that the evaluative schemes used by financial market actors are partly rational, yet involve biases and are likely to lead to overvaluation and undervaluation of certain kinds of product designs by certain kinds of companies. Thus, even from the perspective of profit-maximization, many of the evaluative schemes of the financial market actors are, at most, quasi-rational. Moreover, the evaluative schemes of the financial market actors may motivate company managers to pursue certain kinds of product design rather than others – and may even lead to self-reinforcing (vicious or virtuous) circles of certain kinds of product designs being advocated.

KEYWORDS: strategic design, design strategy, financial market, investors, investment analysts

INTRODUCTION

Both academicians and practitioners in design management have been increasingly interested in the strategic role of product design with respect to companies' business (e.g., Borja de Mozota & Clipson, 1990; Borja de Mozota, 2002; Buchanan, 2008; Hertenstein & Platt, 1997; Heskett, 2001). However, one important, strategic business aspect has been largely ignored in extant literature. That is: How do financial market actors, such as investors and investment analysts, assess, evaluate, and react to companies' product design?

If, indeed, product design is to be strategic issue, the above question is certainly highly relevant – considering that financial market actors are, in the contemporary view, the ultimate overseers of a company's strategies, as well as suppliers of capital needed for implementing the strategies. What is more, the role of financial market as overseer of company strategies has been ever-growing in recent years, as there has in recent years been increasing "financialization" of the corporate world and society in general (Berry, 2000; Clark, 2007; E. P. Davis, 2002; Fligstein & Shin, 2004; Folkman, Froud, Johal, & Williams, 2007; Hawley & Williams, 2000; Krippner, 2005; Martin, Casson, & Nisar, 2007; Tainio, 2003; Zorn, Dobbin, Dierkes, & Kwok, 2004, 2005). And yet, design management -related literature has not been able to provide much insights to the question – not beyond superficially noting that in future, design will play an increasingly important role in firm's financial (owner) relationships, among other relationships (Borja de Mozota, 2003, p. 113).

Thus, the purpose of this article is to examine how financial market actors, especially investment analysts and institutional investors, evaluate and react to companies' product design. In so doing, we contribute to design management literature concerning the issue how design appears to

investors (Borja de Mozota, 2006) – and even to the general management/strategy literature concerning the how investment markets influence and are influenced by companies' product market strategies (e.g., Benner, 2007; Beunza & Garud, 2005; Moreton & Zenger, 2005; Zuckerman, 1999, 2000, 2004) . Our examination shows that while investment analysts and representatives of institutional investors rather rationally view various aspects of product design as signals of companies' quality as investment targets, their understanding of companies' product design is rather superficial, gives rise to biased estimates of companies quality as investment targets, and may even exert institutional pressure on companies to make them adopt pursue certain kinds of product design(s) rather than others. We essentially ground our propositions by integrating piecemeal theories and findings from earlier research. Moreover, we provide illustration to our propositions from an interview study that we have conducted with financial market actors in Scandinavia. Especially, we use examples from the mobile phone industry to elucidate our arguments.

DATA AND METHOD

The interviews, from which excerpts are used to illustrate our propositions, were conducted among Finnish investment analysts and representatives of institutional investors in the winter of 2007/2008. The interviews totaled 16 altogether, with eight investment analysts and eight institutional investors interviewed. Part of the interviewees were employed by Finnish banks or institutions, while part were employed by international institutions (e.g., ABM Amro, Deutsche Banck, Glitnir, Handelsbanken). In addition to companies based in Finland, most of the interviewees analyzed or followed some companies based in other European countries.

In addition to the investment analysts and institutional investors, we interviewed several investor relations managers of large Finland-based, globally operating companies – concerning their views of financial market's ways of assessing the product design of publicly-listed companies. Of these interviews, we utilize especially excerpts from the interview of Nokia's investor relations manager, since Nokia is the most globally operating company of Finland, and since the mobile phone industry provides illustrative examples of our propositions.

Our interview method was semi-structural, and involved a rather free-form discussion with the interviewees concerning the issues how financial market actors in general and/or the interviewee herself tended to assess companies' products and product design. When it comes to our theoretization, we developed our propositions in an essentially iterative way – based on a dialogue between earlier literatures related to financial market actors' practices of evaluating companies' product strategies, on one hand, and the themes emerging from the interviews, on the other.

BACKGROUND:

FINANCIAL MARKET ACTORS AND THEIR EVALUATIVE SCHEMES

In contemporary society, the most important financial market actors can be considered to be (i) institutional investors and (ii) investment (or security) analysts (see e.g., Zorn et al., 2004, 2005). Institutional investors – such as public and private pension funds, mutual funds, banks, and insurance companies – control the majority of wealth that exists in the society and invest it in companies through the financial market, thus exerting a greatest influence on companies' market valuation as well as strategies (e.g., Bushee, 2004; G. F. Davis, Diekmann, & Tinsley, 1994; Edwards & Hubbard, 2000; Grinstein & Michaely, 2005; Hawley & Williams, 2000; Hotchkiss

& Strickland, 2003; Minsky, 1993; Useem, 1996; Whalen, 2002). Investment analysts, in turn, give investment advice (including buy and sell recommendations) to investors, thus acting as *de facto* "surrogate investors" and indirectly influencing company valuations and strategies (e.g., Nicolai, Schulz, & Thomas, 2009; Rao & Sivakumar, 1999; Useem, 1996; Zuckerman, 1999, 2000). To do so, investment analysts conduct research on companies' financial situations as well as current and foreseeable strategies and competitiveness; interrogate top managers concerning potential problems; and elicit information on possible corrective measures (Nicolai et al., 2009; Rao & Sivakumar, 1999). Notably, in this article I refer primarily to these actors – institutional investors and investment analysts – when referring to "financial market actors".

For the financial market actors, companies essentially represent investment opportunities. To them, the quality of a company as an investment opportunity is equivalent to the company's expected financial returns – as constituted by the expected profile of the company's earnings or cash flows in future years¹, as well as the perceived risks related to those earnings. Nevertheless, while the quality of a company as an investment opportunity means to financial market actors essentially the same as the goodness or attractiveness of the company's return-risk profile, the actors – like all of us – face a world of great uncertainty. Under this uncertainty, it is highly difficult to accurately calculate the return-risk profile (i.e., probabilities) for any company. This, in turn, leads the financial market actors to rely on certain simplified calculative or evaluative frames or schemes to evaluate companies (Beunza & Garud, 2005). These frames are, in a way, mental models about how certain cues associated with companies (should) approximately

¹ The expected earnings or profits (as "discounted" to their present value) determine the price that the investors are willing to pay for the company's stock – which, if bought, essentially gives its holder-investor a right to a share of the company's future earnings – and, hence, also determine the stock's market valuation/price.

influence their financial returns. The *cues*, when combined with beliefs about their financial returns implications, thus serve as *signals* for the financial actors about the expected financial returns (Fanelli, 2003) – i.e., as rule of thumb -like *heuristics* (cf. Beunza & Garud, 2005; Frieder & Subrahmanyam, 2005; Gigerenzer, Todd, & ABC Research Group, 1999). Notably, cues, signals, and heuristics is what economic actors in general rely on, when the real future quality of an object (e.g., a product or service) is unobservable to them in the present (Fombrun, 2001; Shapiro, 1983; Zeithaml, Rust, & Lemon, 2001) – like is certainly the case with investment objects.

Moreover, it is not uncommon that the mental models that include evaluative schemes or heuristics become quite widely shared among financial market actors or professionals (Benner, 2007; Beunza & Garud, 2005; Rao, Greve, & Davis, 2001) – just as mental models tend to become shared (institutionalized) in professional, interorganizational fields in general (Porac, Ventresca, & Mishina, 2002). This notion is also consistent with the neo-institutional, omnibus assumption of “collective rationality of organizational fields” (DiMaggio & Powell, 1983). Indeed, examples of cues and heuristics that financial actors commonly utilize include: a company’s current financial soundness and overall reputation (Fombrun, 2001; Shefrin & Statman, 1995; Shefrin, 2001), management competence or charisma (Fanelli & Grasselli, 2006; Lakonishok, Shleifer, & Vishny, 1994; Shefrin, 2001), and brand strength (Frieder & Subrahmanyam, 2005). Thus, a company is often viewed the better investment, the more sound its current financial standing, the stronger its overall reputation, the more competent/charismatic its management, and the higher brand awareness or esteem its products enjoy in markets.

Going beyond these above example heuristics, the purpose of this article is to examine, in particular, the utilization of product design -related cues and heuristics among financial market actors. Essentially, there are two broad types of cues related to companies' product design which financial actors can be observed to assess – the assessments which further affect their evaluations of companies as investment targets. First, financial actors tend to assess (1) companies' individual products (whether current products or announced, new products). Second, financial actors also assess (2) companies' (organizational) capabilities of design(ing). Design assessments in these two senses correspond to the two senses of design often discussed in design research: (1) design as the characteristics of individual end products vs. (2) design as the quality of company's processes (Garner, 2004; Nelson & Stolterman, 2003; Olson, Cooper, & Slater, 1998) or capabilities (Jevnaker, 2000, 2005; Johansson & Holm, 2006; Johansson & Woodilla, 2008; Terrey, 2008) of designing.

DESIGN AS THE PRODUCT:

FINANCIAL ACTORS' ASSESSMENTS OF INDIVIDUAL PRODUCTS OF A COMPANY

In this section, we focus on financial market actors' assessments of the design of companies' individual end-products – especially on assessments of products that companies already and currently have in the market and how these assessments can serve as cues, for financial market actors, about the quality of the companies as investment targets. Note that assessments of companies' new products – or new product announcements – which are not yet in the market will be elaborated on later, in the section dealing with design capabilities.

With respect to assessments of companies' existing, individual products, the financial market actors are likely to seek for and find evaluative cues from (i) certain product category-specific

features of the products, on one hand, and from (ii) more universal product features such as usability, appearance, and overall attractiveness, on the other. These cues and the related heuristics utilized by financial market actors will be elucidated in the following two subsections.

Product category-specific product features

To the extent that financial market actors seek evaluative cues from features of a company's individual products, they are likely to pay particular attention to certain product features that they "know" to be such features that are presently valued (or found important) by the company's product market customers. Notably, these features are not usually specific to one firm only, but are faced by most or all the (competing) companies that produce products in the same product category and serve the same product market. The use of the product category (and the related product market) as the vantage point relates to the general fact that financial market actors, especially in investment analysis, tend to operate to a large extent on industry-category basis. Indeed, when valuing a company's stock, financial market actors usually compare "peer firms" from the same industry, which most often means comparing firms that serve the same product market (Zuckerman, 2004). Furthermore, investment analysts as well as many investors usually specialize in just one or few industries – so as to economize on the costs of information gathering and analysis (Benner, 2007; Boni & Womack; Bradshaw, 2004; Moreton & Zenger, 2005; Schipper, 1991; Zuckerman, 1999). Therefore, they are likely to have at least some specialized knowledge about the product category-specific features that are important to the product market customers of companies of the industry.

Given this context, a basic heuristic that many financial market actors seem to utilize is that the better a company's product excels on a feature that is presently valued or found important by the

product market customers of the product, the higher valuation the company is warranted. Now, on one hand, this heuristic will be quite rational because insofar as a company's product performs well on a feature that is valued by the company's product market customers, the company is likely to enjoy increased demand and sales for the product and even ability to charge premium prices for the product (and, thus, higher profit margins). Conversely, if a company's product performs poorly on a feature that is valued by its product market customers – or misses such a feature altogether –, its demand, sales, and/or price will be undermined, warranting lowered company valuation. In effect, the use of this heuristic is manifest in the case of mobile phone companies, for example, in the fact how Motorola's stock was relatively highly valued in 2006, when the company's main cell phone product Razr excelled on thinness – a feature valued at that time by many consumers. In contrast, the stock market valuation of Nokia suffered, at the same time, from the fact that its products did not perform well in terms of thinness.

An investment analyst: “[In mobile phone industry,] we do look into the product features. Does the product have, for instance 2,5G, 3G, display properties, camera properties, etc.? Things that you can list and see whether the products have them or not, according to the market trends. In this way, product design does matter.”

An investment analyst: “For instance, in 2005-6, Nokia lacked thinness in its products, and the [stock] market punished the company for it.”

Nokia's investor relations professional: “It was not necessarily a fully rational thing [that Motorola was so highly valued in 2005-6]... But the financial community tends to focus on a few current features, and at that time, they believed Motorola's message about thinness.”

Thus, our first proposition is:

Proposition P1: Financial market actors utilize the heuristic that ‘the better a company’s product design excels on a feature that is presently valued by product market consumers of the product, the higher valuation the company is warranted’.

On the other hand, while this heuristic may be partly rational, it is quite dependent on the financial market actors’ *perceptions or beliefs* about what features are valued in the product markets – and even further, on beliefs about what features are valued *presently*. This dependence on perceptions and beliefs, in turn, makes the heuristic essentially vulnerable to perceptual biases. Underlying the potential biases is specifically the fact the financial market actors have no way of accurately knowing all the product feature preferences of all the product market customers of a given product – let alone how those preferences develop in future, on a global scale. This fact leads to a situation whereby financial market actors tend to overweight the influence of certain product features while underweighting or even ignoring the influence of other product features on the future financial earnings of a company.

Especially, one perceptual process that is likely to lead to over- vs. underweighting of certain product features is “availability bias” (e.g., Damasio, 1994; Kuran & Sunstein, 1999). This bias essentially suggests that the sheer volume of messages or signals that imply that some people prefer a certain thing – and that are expressly available in a human observer’s local and physical context – lead the observer to overestimate how predominant the preference for that thing is among people in general. For instance, media attention to some people’s favorable attitudes towards wind power – or vociferous public demonstrations in favor of it – might lead people to overestimate how favorable attitudes people in general have towards wind power. In the present context, thus, the sheer volume of available, local signals implying that a certain feature is valued

by product markets may lead financial market actors to overweight the importance of that feature – and underweight features that are less available in local information environment.

Most notably in the present context, a factor potentially causing availability bias is the fact that financial market actors are likely to have more available information about the product market's preference for certain features when it comes to markets geographically or socially close to the actors themselves. To grasp this, consider that financial market actors in the world are concentrated in financial centers of North America (e.g., New York, Chicago), Western Europe (e.g., London, Frankfurt), and developed Asia (e.g., Tokyo, Hong Kong) and typically represent – in socioeconomic terms – high-income, business-oriented, young or middle-aged, urban adults. This being the case, it is likely that the financial market actors overweight, due to availability bias, product features that they observe to be valued by customers and consumers in markets nearby the actors themselves (e.g., around New York and London), and in socioeconomic markets segments close to the actors' own – while underweighting features valued by customer segments that represent lower social classes or highly different lifestyles, or are geographically farther away (e.g., peripheral Americas, peripheral Europe, Asia, Australia, or Africa).

In the mobile phone market, for example, the above pattern seems to be reflected in the fact that the stock market valuation of Nokia – albeit being the world's product market leader – has again lagged, in relative terms, behind competitors whose product features have been especially valued by business-oriented and high-end consumer segments around New York, London, and Tokyo. The competing companies that have recently fared better with respect to stock market valuation include Research in Motion (RIM), whose Blackberries' have been tuned featurewise for American business people's email use – and Apple Computer, whose iPhones have been tuned

generally for higher income, young urban professionals living in metropolises. While Nokia's products have indeed been shunned by these higher-end segments especially in North America and Japan, it seems that the financial market actors have expressly undervalued Nokia's excelling in product features (e.g., durability, feature richness relative to price, Chinese letter input) that are valued elsewhere – i.e., by ordinary, lower-income mass market customers in e.g., Mainland China, India, South America, and Central/Eastern Europe.

Nokia's investor relations professional: "Clearly, RIM has enjoyed relatively high valuation compared to us recently. Even ridiculously high... They have been emphasizing this feature that they call 'great email experience', to the high-growing niche of business users especially in North America. Nokia, in turn, has had some clear problems in that market.. "

Thus, we propose:

Proposition P2a: Assuming that the design of a company's product excels on a certain product feature X: The more the product market customers of the product presently value feature X (i) in markets *close to* world's financial centers (e.g., New York, London) and (ii) in market segments *close to* the socio-economic profile of financial market actors (e.g., high-income, business-oriented, young adults), the more likely will the financial market actors overvalue the company.

Proposition P2b: Assuming that the design of a company's product excels on a certain product feature X: The more the product market customers of the product presently value feature X (i) in markets *far from* the world's financial centers (e.g., South America, Africa, India) and (ii) in market segments *far from* the socio-economic profile of financial market actors, the more likely will the financial market actors undervalue the company.

Furthermore, note that in the aforementioned heuristic utilized by the financial market actors (proposition P1), the question is essentially about features that are valued in the product markets *presently*. This is likely to give rise to an additional perceptual bias to those suggested above. To simplify, financial market actors have evidently even less knowledge of which features product market customers will value in future than what they know about the presently valued features.

Investment analyst: It is rather impossible for us to try to forecast what products or product features will become the next big or important thing... So, we don't even try or want to be the messenger that knows and tells what new innovation is coming to the world.

Nokia's investor relations professional: "The financial community focuses pretty much on the topics and features of the day: Who's perceived to have the strongest product and product features presently... The valuation is also done mostly based on what is current."

Consequently, due to the lack of knowledge as well as lack of motivation to study what features will be emerging as valuable to product market customers in near or farther future, financial market actors are likely to expressly underweight future product features, while emphasizing product features currently valued in the product markets. This leads to an additional proposition:

Proposition P3: Assuming that the design of a company's product excels on a certain product feature X: The less the feature X is valued by the product market customers of the product in future (vs. presently), the more likely will the financial market actors undervalue (overvalue) the company.

Finally, it is to be noted that the product features in question in the above propositions can be, in principle, either technical/tangible product features or more abstract features or benefits. In mobile phones, for instance, relevant technical features could include "thinness", "battery-time", "display resolution", "camera pixels", "3G data transmission", "touch screen", etc., whereas the

more abstract features could include the mentioned “email experience”, “availability of value-adding applications”, “reliability”, “durability”, and “sound/loudspeaker quality”. Moreover, the abstract features also include product usability, aesthetic appearance, and overall attractiveness. As these are more general, universal features – i.e., independent of product category or industry – and ones that financial market actors themselves especially often associate with the term “design”, we will discuss heuristics related to them separately in the next section. Notably, along with individual product features, the more universal aspects of appearance, usability, and overall attractiveness are also viewed as central factors of product design both in design research and literature (e.g., Buchanan, 2001) and in business research and literature (e.g., Creusen & Schoormans, 2005; March, 1994).

Appearance, usability, and overall attractiveness

With aesthetic appearance and usability, the question to financial market actors is not whether they are valued dimensions for the company's product market customers – as these dimensions are assumingly always valued (“good to have”) – but, specifically, *how much* they contribute product market customers' buying decisions in the company's product category. For instance, in mobile phone markets, the appearance and usability factors are believed to rather central for customers' buying decisions, whereas in some non-durable consumer goods and especially industrial goods, these factors are believed not to contribute much.

Investment analyst: “In mobile phones, I do put quite a lot effort to browse through the products of the different companies and ponder how they look and feel in use.”

Investment analyst: “It depends a whole lot on the industry and product category... With some firms' product categories, you do pay attention to what they look like... Especially in durable consumer ‘hard-goods’. But not so much in e.g., daily consumer products... And also the usability and ergonomic aspects

may be important... But it really depends on whether the consumers of the products care for these aspects when they buy the products... That is what we try to find out in some measure.”

Investment analyst: “At the end of the day, the appearances and usabilities don’t matter extremely much – but may be a sort of additional component that moves our valuation estimates a bit up or down... And this happens mostly in such product categories, where the end consumer cares for these issues... Of course, in some categories, it may be even “all in all”, such as for a fashion or interior decoration company. And in some firms [such as a garden tool company or ski equipment company], it has some effect that the products are good to use and look nice to your eye.... Because these things matter to the consumers’ choices.”

Similarly, even the influence of overall attractiveness of the product to the user or customer is seen as an industry- or category-specific issue.

Investment analyst: “In general, the financial markets do not pay much attention to how attractive a company’s products are to end users. This is especially the case in most industrial products, whereby all the competitors’ products are usually somewhat similar – and it’s also difficult for us to assess whether they are attractive or not, since we are not technical experts. For instance, in industrial equipment or e.g. harbor cranes, these factors do not make any difference. But in products that are closer to consumers, it may matter a bit... Insofar it influences consumers’ purchase decisions and we can assess it.”

Thus, our first proposition concerning the appearance, usability, and attractiveness factors becomes:

Proposition P4: The greater the financial market actors’ belief that the buying decisions of the product market customers of a company’s product are influenced by product appearance/usability/attractiveness, the more will they utilize the heuristic that ‘the better a company’s product is in terms of appearance/usability/attractiveness, the higher valuation the company is warranted’.

While the proposition implies rational reasoning in part, financial market actors' reactions to product appearance and usability may also, again, be analyzed in terms of overweighting and underweighting. First of all, as conveyed by the above interview excerpts, financial market actors seem to have the categorical (dis)belief that in products that are *not* consumer durables, appearance, usability, and attractiveness factors do not matter to buyers or customers – industrial equipment and services (as well as consumer non-durables) being cases in point. Therefore, appearance, usability, or attractiveness of products in categories that are not consumer durables hardly affect the valuation of companies producing them, either. In addition, financial market actors may find it excessively difficult to assess the influence of appearance, usability, or overall attractiveness on customers' buying decisions – again especially in industrial markets, where the customers are often highly specialized technical experts. In any case, considering that from marketing and design research, we know that appearance, usability, and/or overall attractiveness may matter surprisingly much to buyers of industrial equipment as well (REFREF), financial market actors' categorical disbelief or ignorance of the influence of these factors is likely to lead to underweighting of these factors in company valuation. Thus:

Proposition P5: The farther a company's product is from durable consumer goods, the more likely will financial market actors undervalue a company whose product design excels in terms of (a) appearance (b) usability, and/or (c) overall attractiveness.

Secondly, similarly as with category-specific product features, financial market actors may be underweight or overweight appearance, usability, and attractiveness factors due to availability bias, depending on the degree to which consumers in markets that are geographically or socially close to the actors themselves value these factors. For instance, if high-end consumers in New York or London seem to be influenced a lot by mobile phones' appearance and little by their

usability, mobile phone makers whose products excel on the appearance dimension are more likely to be overvalued while ones whose products excel on usability are more likely to be undervalued.

Proposition P6: Assuming that the design of a company's product excels in terms of appearance/usability/attractiveness: The more the buying decisions of product market customers of the product are influenced by appearance/usability/attractiveness (i) in markets close to (vs. far from) the world's financial centers and (ii) in market segments represented by people close to (far from) the socio-economic and lifestyle profile of financial market actors, the more likely will the financial market actors overvalue (undervalue) the company.

Thirdly, there is another potential bias involving the availability bias and geographical or social closeness: The degree to which the financial market actors perceive the company's product to be good in appearance, usability, or overall attractiveness. Notably, this perception is different from the perception or belief of the extent to which the dimensions of product appearance, usability, or overall attractiveness are valued by the consumers of a given product in the first place. This aspect becomes significant especially due to the fact that consumers' conception of what makes up good appearance, good usability, or good overall attractiveness often varies significantly from one market to another (both across geographic markets and across socioeconomic market segments). For instance, in mobile phones, different geographic markets have in recent years differed in terms of whether good appearance (or usability) has meant clamshell design or bar design, touch screen display or QWERTY keyboard, aluminum colored shell or brightly colored shell, and haptic usability or software usability.

Investment analyst: "It is admittedly pretty difficult to measure the goodness of design in terms of form or appearance. Should the product have rounded or have corners, for example? So, quite often I rely to some

extent on my own and my colleagues impressions of whether the product gives you a 'wow' effect when you look and test it... Sometimes you can also go to nearby stores and see how people react to certain products...."

Nokia's investor relations professional: "In some markets such as USA, touch screen and software usability, for example, are currently valued pretty much when it comes to design and usability... But it's not the same everywhere, the markets differ considerably."

Investment analysts: "Sometimes you forget that beauty ideals can differ from market to market quite a lot. For instance in China... people may find a certain phone very fancy, while we in Europe find it totally horrible. And in the US, they have their own things... Also in usability, a majority of Nokia's basic users in Europe and India, for instance, like their phones' usability, they are accustomed to it... But in the US market, consumers typically consider that Nokia's usability is very bad – in the US market, Nokia indeed receives very low scores in usability ratings."

Our proposition here is analogous to the previous one. Namely, financial market actors are likely to tend towards overestimating the degree to which the excellence of a company's product along the *standards* of appearance, usability, and attractiveness *that are prevalent in markets close to the financial market actors themselves* will signal about the company's overall sales, earnings, and financial returns (and, thereby, overall valuation). For instance, Motorola's market valuation in 2006 was enhanced by its thin RZR product at the time when the good appearance meant extreme thinness to consumers in markets close to the world's financial centers, especially in the US and Western Europe – even if extreme thinness was not similarly preferred in other parts of the world. Similarly, Apple's market valuation has been enhanced in 2007-2009 by iPhone's featuring touch screen, at the time when consumers in the US, especially, have associated touch screen with good aesthetics and usability – even if in many parts of the world, touch screen has been associated rather with poor usability and dull aesthetics. At the same time, Nokia's market valuation has lagged behind, as it first did not provide models of extreme thinness preferred in

the US, and then was considerably delayed with touch screen phones – even if it made record profits with phones featuring other kind of aesthetics and usability in the huge markets of India, China, and Central Europe, for instance.

Proposition P7: The more does the design of a company's product excel in terms of such appearance/usability/attractiveness standards that are presently cherished by the product market customers of that product (i) in markets close to (vs. far from) the world's financial centers and (ii) in product market segments close to (far from) the socio-economic and lifestyle profile of financial market actors, the more likely will the financial market actors overvalue (undervalue) the company.

DESIGN AS A CAPABILITY: FINANCIAL ACTORS' ASSESSMENTS OF A COMPANY'S NEW PRODUCTS AND CAPABILITIES TO DESIGN SUCH

The above discussion and propositions have pertained primarily to the relationship of companies' existing products and financial market actors' valuation of the companies. In this section, we move to consider *new* products that companies announce. In principle, the above propositions also apply to new products, in a sense that a new product may enhance market valuation insofar as it is viewed to perform well on a feature that is presently valued by product market consumers of the product (cf. proposition P1) or on a feature especially valued presently by product market customers of the product in markets close to world's financial centers (cf. proposition P2), for example. Nevertheless, in addition to reactions implied in above propositions, new products, the development or introduction of which a company announces, are likely to also elicit other valuation reactions. Essentially, these valuation reactions involve, as elaborated below, financial market actors' perceptions of the companies design capabilities.

Announced, new products – vis-à-vis design capability perceptions

Notably, new products that companies announce can range from ones that are quite immediately introduced to the market and start to be sold (see e.g., Lane & Jacobson, 1995; Pauwels, Silva-Risso, Srinivasan, & Hanssens, 2004; Srinivasan, Pauwels, Silva-Risso, & Hanssens, 2009) to ones that are merely in the development stage and will be introduced to the market only later, if ever (see e.g., Chaney, Devinney, & Winer, 1991; Pauwels et al., 2004). In any case, what is characteristic to new product announcements is that the new product in question is not sold yet in the market. Thus, financial market actors (nor anyone else) has basically no information of the product's prior sales, on the basis of which one could judge or estimate the product's likely future sales and, hence, earnings value. This being the case, financial market actors do not tend to have much "trust" in a random new product's future sales – not until the product has actually started to sell and the company itself or another source reports information about the sales.

Investment analyst: "Its quite hard to know about [a new product's success] beforehand. Therefore its difficult for you to update your valuation estimates on the basis of them – and we don't even want to do that... In the financial market 'seeing is believing', you know. As long as a product is not physically ready and touchable and not in the market, you don't include it to your valuation estimates too much... Usually, you will not do it until the sales has started off -- when you can judge whether the development and design has been successful. "

In addition to the "unknowable" forthcoming sales of a new product that is announced, the remaining development and design work – and, hence, development and design costs – as well as market launch costs are also unknowable and subject to great uncertainty at the time of the announcement. What is more, the eventual costliness of producing and delivering the product continuously after the launch is subject to uncertainty (i.e., production and delivery costs) as is also the risk how quickly competitors can and will imitate the product once it is in the market

(thus driving down the market share and prices of the product). Due to all these reasons as well as the fact that the company may not ever be able to even finish the design work of a pre-announced product (i.e., actually introduce it to the market), there is indeed considerable uncertainty related to the future profits of an announced, new product. Therefore, there is hardly any universal pattern of financial market actors' reactions to a new product announcements. This is consistent with the marketing research finding that new product introductions bring little change to company's stock valuations (e.g., Chaney et al., 1991; Pauwels et al., 2004) – not until the product has actually been introduced to the market and actual sales and profit figures start to come in. Thus, we propose:

Proposition P8: Financial market actors' reactions to companies new product announcements have no unanimous direction or intensity.

However, one clear pattern is in any case discernable in financial market actors' reactions to companies' new products or new product announcements – and this pattern centrally involves financial market actors' perceptions of companies' (design) capabilities. Namely, while financial market actors are primarily interested in the quality of a new product in terms of its profit potential, they often seem to make, as elaborated below, judgments of the product's profit potential on the basis of their perceptions of the company-specific capability of designing new products to the market. Thus, financial market actors – when they face the uncertainty of nature and quality of the announced new product in terms of future profit implications – appear to use an additional heuristic that is rather analogous to the heuristic to which consumers often resort when the quality of a product is unobservable to them: the supplier's reputation as a signal of the product's quality (Fombrun, 2001; Shapiro, 1983; Zuckerman, Kim, Ukanwa, & von Rittmann, 2003). Especially, the question here is about supplier reputation in terms of its perceived degree

of “productive knowledge assets” (Rindova, Williamson, Petkova, & Sever, 2005) – the capability to design and introduce new products being such an asset in the present context. At the same time, the utilization of this heuristic is indicative of the fact that not only are financial market actors’ evaluations of companies influenced by their perceptions of the features of companies’ end products but also by their perceptions of companies’ “design capabilities” (cf. Jevnaker, 2000, Jevnaker, 2005; Johansson & Holm, 2006; Johansson & Woodilla, 2008; Terrey, 2008) – especially when companies announce new products.

Specifically, in the context of financial market, a company’s perceived design capability counts at least in three ways when the company announces a new product. First, there is the issue of the company’s current product category or product categories. In simple terms, financial market actors are likely to perceive a company to have a better capability of designing successful products in their current product categories or categories close to the current categories, rather than in other categories that are far from the current categories.

Fund manager of an institutional investor: “The product category is important in the trust you have when a firm announces it will introduce a new product.. For instance, I might be suspicious of the capability of a sports equipment manufacturer to design a clothing line.”

Second, the question can often be also about the company’s perceived capability concerning individual product features which are emphasized in the company’s new product as its main competitive features. Let us call these the (claimed) *competitive features*: i.e., those features that the company implies as such features that are especially important in the new product, for its

market success². The question here can be about certain product category-specific features – such as sound quality or email experience in mobile phones – or universal features such as appearance or usability.

Investment analyst: “Apple, for instance, has the reputation that it has the ability to create very intuitively usable products, with true ‘plug-and-play’ functionality. So, you tend to believe that their new products achieve that ease of use as well... In contrast, RIM and Nokia have had problems in how easy their products are to take into use – and you wouldn’t necessarily believe that a new product from them is easy to take into use even if they claimed so... On the other hand, Nokia, for instance, has in Asia and India the reputation of producing highly reliable and durable phones. So, it’s easy to believe they have they perform well in this sense with their new products, as well.”

The heuristics implied by the two capability issues above leads to a pattern whereby the greater capability a company is perceived to have in designing successful products (1) in certain categories and/or (2) emphasizing certain competitive features, the more positively the financial market actors are likely react to such new products by the company which belong to the same categories and/or emphasize the same features. Conversely, the less positively the financial market actors are likely to react to other kinds of products, i.e., products in categories non-related to the company’s earlier product categories as well as products which claim to perform well on certain competitive features on which the company does not have the reputational/perceived capability of performing well.

² When announcing new products, companies indeed imply – in their customer and/or investor communication – some of their features as the most important ones, relative to existing products in the market. This can be done explicitly by pointing out “the most important new features” of the new product, or implicitly by listing or mentioning certain features while not mentioning others.

Now, superficially, these heuristics are again quite rational since according to a commonplace notion, to company's sustained profitability is based on utilization and leveraging of its existing (core) capabilities (e.g., Hamel & Prahalad, 1994; Prahalad & Hamel, 1990; Priem & Butler, 2001). However, the heuristics are – again – also likely to lead to misjudgments and biases if/when used in a unilateral and “taken-for-granted” way. Namely, on one hand, companies often know and have the ability to do more than what they can be perceived, by outsiders, to know or be capable of (Benner, 2007; Brusoni, Prencipe, & Pavitt, 2001). Thus, a company may well have design capabilities beyond those perceived or observed, by outsiders, as its existing capabilities. For example, a company's geographically and organizationally dispersed processes related to understanding users' needs around the globe and across social classes, and processes of designing tailored products to suit different segments, may be highly difficult for outsiders to discern – and yet these processes may incorporate significant design capabilities. On the other hand, it is also – conversely – possible that a company may not truly have the design capabilities that it is perceived to have. For instance, Amazon was widely perceived, by financial market actors, to have the capabilities for designing an on-line retailing service for toys that it announced (Benner, 2007) – a product/service which was close to its current product category of on-line book store, and which emphasized the same competitive features of on-line usability and convenience. Therefore, the initial reactions of financial market actors to the new service were highly positive – yet the new service eventually failed miserably. Thus, we propose:

Proposition P9: The closer (farther) a company's new product is to (from) the company's existing product categories, the greater (lesser) capability is perceived to have in designing the product, and the more likely will financial market actors tend towards overvaluing (undervaluing) the company as a reaction to its announcing the new product.

Proposition P10: The greater (lesser) capability a company is perceived to have in designing products that excel on a feature X, the more likely will financial market actors tend towards overvaluing (undervaluing) the company as a reaction to its announcing a new product emphasizing feature X.

Thirdly, it can be noted that in addition to analysts and investors' being reactive to companies' capabilities in designing products in certain product categories and in designing products with certain features, they are also reactive to companies' capabilities in designing and introducing new-to-market or imitative products. This relates to the commonplace distinction that new product introduced by companies may sometimes be truly new-to-market or -world, whereas often they are "merely" new kinds of products to the introducing firm – i.e., somewhat imitative of other companies existing products in the market (cf. Booz, Allen, & Hamilton, 1982; Garcia & Calantone, 2002). In any case, a company may be seen to have (or lack) special capability of designing and profitably introducing new-to-market products vs. imitative products.

Nokia's investor relations professional: "For instance, the financial community sees that Apple has the track record to introduce innovative, new-to-market products, even product categories – whereas Nokia is seen to be rather a fast imitator or follower. The financial market's reactions to our new products are influenced by these perceptions.

Here, the heuristic is, again, partly rational – yet is likely to cause biased evaluations valuations when applied unilaterally. Thus, we propose, analogously as above:

Proposition P11a: The greater (lesser) reputational capability a company is perceived to have in designing successful new-to-market products, the more likely will financial market actors tend

towards overvaluing (undervaluing) the company as a reaction to its announcing a new product that is new-to-market.

Proposition P11b: The greater (lesser) reputational capability a company is perceived to have in designing successful imitative products, the more likely will financial market actors tend towards overvaluing (undervaluing) the company as a reaction to its announcing a new product that is imitative.

Sources of design capability perceptions: Assessments of a company's track record

The above propositions involving the issue of company capabilities expressly suggest that financial market actors' perceptions of a company's capability in designing (and introducing) certain kinds of new products influence their assessments of the profit potential of individual new products and, thereby, company valuation. However, the above propositions are somewhat silent concerning the issue where the capability perceptions stem from. In this section, we shed additional light on this issue.

While above, we viewed that financial market actors' reactions to a company's new product are influenced by its perceived reputational capability of designing successful products of the kind, we extend this point here by proposing that the reputation or perceived capability is mainly constituted by the company's past performance in designing successful products of the same kind. This proposition is analogous to the view in economics (Shapiro, 1983), strategy (Grewal, Kayande, & Roberts, 2005; Rindova et al., 2005; Weigelt & Camerer, 1988), and sociological research (Raub & Weesie, 1990; Zuckerman et al., 2003) that the relevant capability reputation of a product's supplier, which is used as a signal of the quality of the product, is mainly constituted

by the supplier's past performance – or “track record” – of supplying similar high-quality products. The same notion can be applied to the perceived capability that a company is perceived to have in designing products in its certain, existing product categories (cf. proposition P9) and products that emphasize or perform well on certain features (cf. proposition P10) as well as in designing new-to-market products (cf. proposition P11a) and/or imitative products (cf. proposition P11b).

With respect to a company's capability to design products primarily in the product categories of its earlier or existing products, financial market actors seem to view a firm's capabilities somewhat narrowly, indeed pertaining mostly to the company's prior or current product categories (proposition P9). Even further, the design capability may often be presumed to pertain rather exclusively to a certain sub-category of the firm's current products (e.g., cancer drugs) rather than a broader category to which they belong (drugs in general).

Fund manager of an institutional investor: “Of course, I expect that a company that has a track record of designing cancer drugs, has the capability to do it in future, too... On the other hand, track record in cancer drugs does not make you a good heart disease drug developer.”

In the context of mobile phone manufacturers, this is manifested in, for example, financial market actors' initial suspicion about Nokia's ability to design successful gaming devices the N-Gage device was announced (considering Nokia's existing categories being mobile phones and networks) and, conversely, about Apple Computer's ability to design a successful mobile phone (considering its prior product categories being computers and mp3 players). Notably, in the former case, the suspicion turned out to be justified (with the market failure and losses incurred

by N-Gage), while in the latter case, the suspicion turned out to be unfounded (with the huge market success and profits of iPhone).

With respect to certain product features, in turn, financial market actors view that a company has capability in designing products that excel on such features on which its products have previously excelled, as well.

Investment analyst: "For instance, if KONE [the elevator company] introduced a new product that features a new space-saving solution, it's easy for me to be confident about its success, since KONE has introduced such solutions earlier, too. The same is true for the reliability and safety of their elevators."

In mobile phones, in turn, Motorola has been seen to have capability to design thin and "sexy" phones; Samsung products with flashy outlooks and high-quality displays; RIM products with email experience and business use compatibility; Nokia products with usability, durability, and reliability; and Apple products with user interface experience, plug-and-play compatibility, and minimalistic styling – all mostly because of the companies' respective track records in designing successful products emphasizing and performing well on these features.

Finally, with respect new-to-market and imitative products, a company's track record in designing (many) successful new-to-market products over the years tends to reinforce its perceived capability (reputation) in designing new-to-market products in future, too. Likewise, a track record in designing (many) imitative products – that successfully follow or imitate innovations made by competitors – tends to reinforce its perceived capability in designing imitative products again.

Investment analyst: "For instance, Apple has a somewhat good track record in designing innovative products that are in a way totally new to the world. In a way, creating new product categories altogether. So, you kind of expect and trust that they can do it again, too... In contrast, Nokia has more of a track record of being a good and fast follower of others."

In sum, hence, our final propositions become:

Proposition P12: The greater (smaller) the number of products that a company has successfully designed and introduced in the past in a certain product category, the greater (lesser) capability the company is perceived to have in designing successful products in that category.

Proposition P13: The greater (smaller) the number of products that a company has successfully designed and introduced in the past and that excel on a certain feature, the greater (lesser) capability the company is perceived to have in designing successful products emphasizing that feature.

Proposition P14a: The greater (smaller) the number of innovative, new-to-market products that a company has successfully designed and introduced in the past, the greater (lesser) capability the company is perceived to have in designing successful new-to-market products.

Proposition P14b: The greater (smaller) the number of imitative products that a company has successfully designed and introduced in the past, the greater (lesser) capability the company is perceived to have in designing successful imitative products.

DISCUSSION

On one hand, our theoretization and propositions implicate that financial market actors such as investment analysts and institutional investors are to some extent quite rational in evaluating and

reacting to companies' product design. They pay some attention to both of the main aspects of product design discussed in contemporary design research – (1) design as the characteristics and features of individual end products and (2) design as a company capability (Jevnaker, 2000, Jevnaker, 2005; Johansson & Holm, 2006; Johansson & Woodilla, 2008; Terrey, 2008) – in a quest to assess how the current and new products of a company are likely to influence the company's expected financial earnings and, thereby, to evaluate the quality of the company as an investment opportunity. Indeed, the rationality of the heuristics that we propose the financial market actors to utilize is partly justified. For instance, utilization of the heuristic that assumes that 'the better a company's product performs on a feature that is presently valued by product market consumers of the product, the higher valuation the company is warranted' (proposition P1) is fairly rational – considering that design research (e.g., Boztepe, 2007; Aspara, 2008) as well as strategy (e.g., Adner & Zemsky, 2006; Bowman & Ambrosini, 2000; Mol, Wijnberg, & Carroll, 2005; Priem, 2007) and basic marketing literatures (e.g., Anderson & Narus, 1999; Kotler, 2000) stress that the ultimate profits captured by a product are likely to be significantly determined by how product market customers value the product. As another example, it is fairly rational for the financial market actors to react to a company's new (announced) product the more positively, the closer the product is to the categories of the company's existing categories (cf. proposition P9) and the more capability the company is perceived to have in designing products that excel on those features that are emphasized in the new product (cf. proposition P10). After all, one of the omnibus prescriptions of strategy literature is that the company's profitability is best enabled by focused utilization and leveraging of its prior or existing core resources and capabilities (Hamel & Prahalad, 1994; Prahalad & Hamel, 1990; Priem & Butler, 2001).

On the other hand, however, the evaluative schemes of the financial market actors are, indeed and at best, *quasi-rational*. That is, while involving partially rational heuristics, the heuristics also are somewhat superficial and may give rise to biased assessments of companies' qualities as investment opportunities – relative to their true potential. This is implied by the proposed tendencies towards over- and undervaluation of companies on the basis of assessments of their existing products, and as reactions to new product announcements. For instance, insofar as financial market actors overvalue (undervalue) – due to availability bias – a company whose product performs well (badly) on features that are valued presently by product market customers in markets close to financial market actors themselves (e.g., New York/USA, London/Western Europe), a potential bias with respect to the true value of the company inevitably emerges (especially if the company's main product markets are geographically or socially far from the businessmen of New York and London). Similarly, a bias is more than likely to emerge, as financial market actors are likely to undervalue a company whose product performs well in terms of (a) appearance (b) usability, and/or (c) overall attractiveness but whose product does not represent durable consumer goods.

Moreover, when it comes to perceived design capabilities, less than rational, biased reactions to companies' new product announcements are likely to occur insofar as financial market excessively base their estimate of the new product success and profitability on the company's presumed capability to design successful products of the kind – as judged quite unilaterally by the company's earlier track record of designing and introducing such products. This may lead to stock price reactions whereby new products close to the company's existing product categories and featuring the same, good-old features are evaluated overly positively whereas new products

farther to the company's existing product categories and featuring novel features (for which the company does not have track record) are evaluated overly negatively.

As a matter of fact, especially the latter tendency and potential bias may also cause severe implications in company strategies. This is because company managers are in general likely to be motivated to choose and implement such company strategies to which the financial market actors react positively – due to e.g., managers' salaries being tied to companies' stock valuations (Benner, 2007; G. Davis & Useem, 2002; Froot, Perold, & Stein, 1992; Rao & Sivakumar, 1999; Rhodes-Kropf, Fisman, & Khurana, 2005). Thus, insofar as a company's decision to design a new product that deviates from the company's existing product categories and/or have certain new-to-company features is likely to be evaluated negatively by financial market actors, the company managers may be less motivated to implement such product design strategies – and instead choose to design products that suit the company's existing product categories and that have features for which the company has track record. This pattern may even come to involve a self-reinforcing, vicious circles. Namely, insofar a company C has track record for a certain feature X (e.g., thinness, clamshell form, minimalistic styling, display, or sound quality), financial market actors are likely to react positively to such new products by company C that emphasize feature X. Now, this fact is likely to increase the motivation of company managers to pursue product designs that emphasize feature X, which is likely to lead to company C introducing new products emphasizing feature X, which in turn further reinforces company C's track record for designing products that emphasize feature X. This example is illustrated in Figure 1, and clearly involves a potential self-reinforcing, circular chain of effects. For instance, the fact that mobile phone makers for quite long stick to exclusively producing mobile phones (until, only very recently, expanding to new product and service categories) might be explained

with this kind of self-reinforcing circle – as might also each company's continuously focus on designing products that emphasize the same few features (e.g., Nokia's focusing on bar forms, feature richness, and technical usability; Motorola's focus on thinness and sexiness; Samsung's focus on clamshell forms and flashy appearance).

In sum, thus, the financial markets – or, the (micro-)practices and heuristics of investment analysts and investors – may actually act as a rather conservative force with respect to companies' design strategies. The financial market's apparent encouragement of new products that fit to the company's existing product categories and discouragement of new products outside the existing categories is a case in point – as is the encouragement of product designs that incorporate "good-old" features for which the company has track record and discouragement of new features for which the company does not have track record. In effect, concentration on the same may be detrimental to companies' innovation – and it is not fully rational from the behalf of profit-seeking financial market actors, either. Indeed, companies often have a broader range of knowledge and capabilities than is suggested by their earlier products categories and product features (those for which they have track record) – firms often do know and are capable of more than what they currently make or have previously done (Benner, 2007; Brusoni et al., 2001). This is likely to apply to design capabilities as well – meaning that excessively relying on track record assessments will not be fully rational, as companies are often capable of more than what their track record suggests.

Yet, finally, it must also be noted that the self-reinforcing circle may in some cases be virtuous (as opposed to vicious) as well. This might be true especially with "universally good" features such as aesthetic appearance and usability (as opposed to product category-specific technical

features). In the case of such design features, the track record of a company (e.g., on usability) may enhance the motivation of the company to design further products that excel on the same feature – leading to further track record, and thus potentially to a self-reinforcing virtuous circle. Perhaps the case of Apple Computer is an instance of just this kind of virtuous circle, where the company has excelled continuously in terms of usable new products and at the same been increasingly rewarded by the financial market for doing so. Notably, in Apple's case, a similar virtuous circle might have occurred with its track record of radical new-to-world products, as well, whereby a few of Apple's new-to-world offerings (e.g., graphic computer operating system, iPod/iTunes combination, and iPhone smartphone with related "apps") may have lead to perceived capability of designing successful new-to-world products, which in turn has motivated the company to design even more new-to-world products.

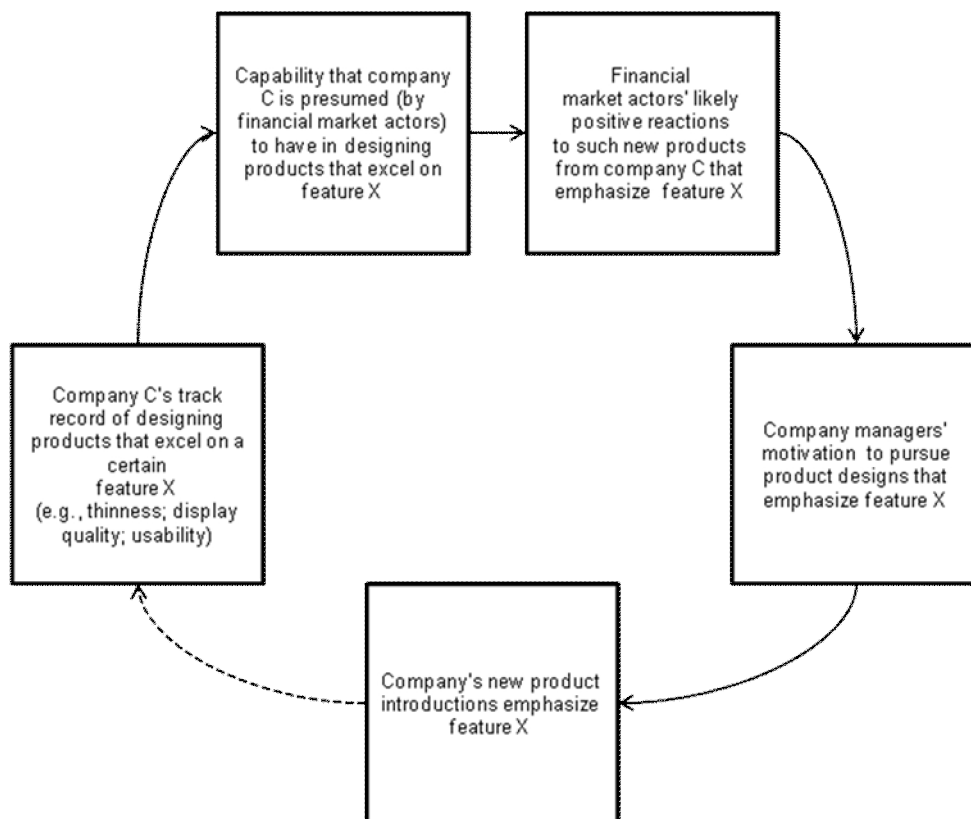


Figure 1. Self-reinforcing circle of design track records, capabilities, and new products

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