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Stefan Tams

*Clemson University*, stefan.tams@hec.ca

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# Trust-Building in Electronic Markets: Relative Importance and Interaction Effects of Trust-Building Mechanisms

**Stefan Tams**

Department of Management  
Clemson University  
stams@clemson.edu

## ABSTRACT

We examine the relative and complementary effectiveness of trust-building strategies in online environments. While prior research has examined various antecedents to trust, we investigated two trust-building mechanisms more in depth: Web site trust and vendor reputation. We tried to understand the relative effectiveness of these two important mechanisms to provide online businesses with a clear recommendation of how to establish trust in an effective and efficient manner. Drawing from the literature on trust, we proposed vendor reputation to be more effective than Web site trust. Moreover, we examined a potential complementary effect of these mechanisms so as to provide online businesses with a deeper understanding of how to derive superior trust. We hypothesize a small such effect. The study proposes a laboratory experiment to test the model.

## Keywords

Trust, reputation, Web site trust, interaction, relative effectiveness, electronic markets, electronic commerce.

## INTRODUCTION

Trust has long been identified as an essential element of all social exchange relationships (Barber 1983; Barnard 1938; Deutsch, 1960). This is especially true for business relations, which rest upon the foundation of trust to be effective (Sitkin and Roth, 1993; Williamson, 1975). Trust is particularly important when two factors are present in a given transaction process: risk (uncertainty) and incomplete product information (information asymmetry) (Swan and Nolan, 1985).

Electronic commerce is a recent form of social exchange in which most transactions occur among social parties without any face-to-face contact. As in traditional social exchanges, trust has been regarded crucial for electronic market transactions (Ba, Whinston and Zhang, 1999; Benbasat, Gefen and Pavlou, 2008; Brynjolfsson and Smith, 2000; Pavlou and Gefen, 2004). Given the impersonal nature of electronic markets, trust can be considered even more difficult to establish in this environment (Ba and Pavlou, 2002; Lim, Sia, Lee and Benbasat, 2006).

The impersonal nature of electronic markets in general and the lack of face-to-face contact in particular imply higher risks associated with business transactions. These risks mainly stem from incomplete security regarding seller authentication. Additionally, online marketplaces have less of an opportunity to provide buyers with product information than do traditional marketplaces, which most often have the product in demand on their shelves. This lack of product information is particularly critical regarding product quality, since the products cannot be physically examined prior to any transaction (Ba and Pavlou, 2002).

In an attempt to help online vendors overcome the difficulty inherent in establishing trust in an electronic market context, several studies have been conducted to identify potential antecedents to trust in this impersonal environment (e.g., Ba and Pavlou, 2002; Pavlou and Gefen, 2005; Pennington, Wilcox and Grover, 2003). While several such factors have indeed been found, the nature of trust in electronic commerce and the mechanisms to establish trust remain ambiguous (Lim et al., 2006).

While recent research has provided online vendors with a rich set of potential trust-building mechanisms, their relative importance remains unclear. Since trust-building is a difficult endeavor, it is important to provide online vendors with a clear understanding of potential differences in the effectiveness of trust-building strategies. Moreover, potential synergies among those factors might yield superior results regarding trust-building and might thus generate extraordinary returns on investment for online vendors. Thus, we attempt to answer the following questions:

1. *Do different trust building mechanisms (namely, Web site trust and vendor reputation) have different effects on vendor trust in an electronic-market context?*
2. *Do different trust-building mechanisms (namely, Web site trust and vendor reputation) interact so as to allow for superior trust?*

The remainder of this proposal is structured as follows: the next section reviews the literature on trust and how it develops in electronic markets. It then develops the theoretical foundations of the concept of value-adding interaction effects. Afterwards, our theory will be developed, followed by a quick overview over the study's task, design, and methods. The paper will then turn to the hypotheses and methods. Subsequently, the expected results and their implications will be discussed.

## LITERATURE REVIEW

Due to the importance of vendor trust in online environments (Ba and Pavlou, 2002; Lim et al., 2006), a large number of studies have examined its antecedents and consequences (e.g., Ba and Pavlou, 2002; Lim et al., 2006; Pavlou and Gefen, 2004; Pavlou and Gefen, 2005; Pennington et al., 2003). While the consequences of trust have largely been clarified and mainly relate to its importance for purchasing intentions, actual purchase behavior, and price premiums (Ba and Pavlou, 2002; Lim et al., 2006; Pavlou and Gefen, 2005; Pennington et al., 2003; Schurr and Ozane, 1985), its antecedents or trust-building mechanisms are not yet well understood (Lim et al., 2006).

Important trust-building mechanisms include portal affiliation, satisfied customers' endorsements, vendor reputation, and Web site trust (Ba and Pavlou, 2002; Fuller, Serva and Benamati, 2007; Lim et al., 2006; McKnight, Cummings and Chervany, 1998; Pavlou and Gefen, 2004; Pennington et al., 2003). Portal affiliation has been studied as a promising mechanism to establish vendor trust (Lim et al. 2006; McKnight et al., 1998). It has been widely used by practitioners trying to influence consumer trust in online stores. Portal affiliation as a way to build trust is based on the concept of trust-transference, which posits that trust in an established vendor can be transferred to other vendors by virtue of their association. For example, an unknown vendor associated with Amazon.com could benefit from this link through trustworthiness being transferred from Amazon.com to the unknown vendor. Despite the potentially high practical importance of portal affiliation, studies so far have failed to show that it indeed has significant impacts on vendor trust (Lim et al., 2006).

Satisfied customers' endorsements are an important antecedent to trust in online vendors (Lim et al., 2006). Such endorsements refer to the display of one or more positive customer testimonials on a vendor's Web site and were supported, for example, by McKnight et al. (1998). They serve as an antecedent to trust by the means of unit grouping, which establishes group-based trust. Essentially, consumers who share common characteristics tend to trust each other so that the trust some people have towards a vendor can be transferred to other people who are similar (Lim et al., 2006).

Vendor reputation has also been studied as a potential antecedent to vendor trust and has been shown to explain a substantial amount of variance in trust (e.g., Ba and Pavlou, 2002; Fuller et al., 2007; Lim et al., 2006; Pennington et al., 2003). Higher vendor reputation is suggested to increase consumers' beliefs that the vendor has the ability to deliver products or services at the promised terms (Lim et al., 2006; Pennington et al., 2003). It also suggests a high level of integrity regarding potential problems with the contract fulfillment (Lim et al., 2006). Essentially, a vendor's reputation is the degree to which consumers believe that a vendor is honest and concerned about its customers. Reputation captures personal experiences, vendor history, and the social presence of the vendor, as well as its products and actions (Pennington et al., 2003).

System or Web site trust has been suggested to be another important determinant of vendor trust (McKnight et al., 1998; Pennington et al., 2003). Indeed, it has been found not only to be a highly significant determinant of vendor trust, but also to explain a substantial amount of variance in vendor trust (Pennington et al., 2003). The importance of Web site trust moreover becomes apparent from human factors research on automated systems positing that users are more likely to trust reliable systems, for example in the case of adaptive cruise control (Norman, 2006). Web site trust refers to the belief that the proper impersonal structures have been put into place, thus enabling a consumer to anticipate successful transactions with a vendor (Pennington et al., 2003).

Lim et al. (2006) examined the relative importance of portal affiliation and satisfied customers' endorsements as determinants of trust. The underlying commonality of these constructs is trust transference; both antecedents rely on trust being transferred from one entity to another. In the case of portal affiliation, trust is being transferred from one vendor to another, while in the case of satisfied customers' endorsements, it is being transferred through customers. Thus, both mechanisms differ in the proof source of trust, that is, trustworthiness is proven by other consumers in the case of satisfied customers' endorsements, while it is proven by other vendors in the case of portal affiliation (Lim et al., 2006). Since portal affiliation provides much less specific information about an online store than do satisfied customers' endorsements, which usually mention specific

events or experiences customers have had with a vendor, Lim et al. (2006) hypothesized and empirically verified that satisfied customers' endorsements are more effective than portal affiliation in enhancing vendor trust.

As we have just seen, several antecedents to trust in online stores have been examined. However, there is still no clear understanding as to what the strong determinants of trust are (Lim et al., 2006). While Lim et al. (2006) investigated the relative importance between portal affiliation and satisfied customers' endorsements, the result did not prove particularly insightful since portal affiliation by itself has not been positively related to trust.

Thus, the quest for a powerful determinant of trust as well as potential synergies among its antecedents remains. Several studies in the literature on organizational resources and activities have investigated potential synergistic effects among resources or activities and found superior results based on synergies (e.g., Milgrom and Roberts, 1995; Tanriverdi and Venkatraman, 2005). In the electronic commerce context, however, such research has been scarce in terms of formally proposed and tested hypotheses. This is surprising given the intense competition faced by many online vendors.

Since both vendor reputation and Web site trust have been found to be strong determinants of trust that individually explain a substantial portion of its variance, examining their relative and synergistic effects on trust appear to be important contributions. The next section will develop the theory regarding the relative importance of reputation and Web site trust as well as their potential synergies for trust-building.

## THEORY DEVELOPMENT

Both Web site trust and vendor reputation are important determinants of vendor trust (e.g., Ba and Pavlou, 2002; Pennington et al., 2006). In the following paragraphs, we develop rationales for (1) their relative importance regarding vendor trust and (2) their potential interaction, thus leading to superior trust.

As Web site trust and vendor reputation have different underlying sources of their effects on vendor trust, the strength of their effects on trust might differ significantly. Specifically, Web site trust is not directly associated with a vendor itself, but with its impersonal structures that have been put into place to enable consumers to anticipate successful transactions with the store. This type of trust-building mechanism establishes vendor trust indirectly through the features of the store's Web site. Reputation, in contrast, as the extent to which consumers believe that a vendor is honest and concerned about them, more directly refers to the vendor itself and its operations. Reputation captures personal experiences, vendor history, and the social presence of the store as well as its products and actions. These direct firsthand experiences along with the vendor's history provide more specific information for potential consumers to form an impression about the store than do the more indirect features of the vendor's Web site. Indeed, a trust-effective Web site only says that proper impersonal structures are in place. It does not provide as much specific and historic information about the store itself. Therefore, in the case of Web site trust, it may be more difficult for consumers to form a favorable impression toward the store.

Vendor reputation and Web site trust may also interact and hence complement each other, thus enabling superior trust. The concept of synergy is defined in the strategy and economics literature in terms of super-additive value (Tanriverdi and Venkatraman, 2005) and stems from the interaction of two or more variables. Both trust-building mechanisms could create super-additive value synergies if their interaction effect on trust is greater than the sum of their individual effects: Interaction effect (Web site trust, Vendor reputation) > Effect (Web site trust) + Effect (Vendor reputation).

To evaluate potential synergistic or interaction effects, it helps to think of one mechanism to be of limited value without the other (Shocker, Bayus, and Namwoon, 2004). For example, computer hardware is of very limited value without computer software, and vice versa. It then becomes reasonable that trust in a vendor's Web site is of limited value when personal experiences, vendor history, and social presence are low. For instance, if a potential consumer trusts a store's Web site and the vendor's ability to deliver, the consumer might still lack a perception of trust regarding the vendor's honesty and concern for its customers. Consequently, the potential consumer might keep searching for other vendors who also satisfy the other dimension of trust, given the low search costs on the internet (e.g., Grover and Ramanlal, 1999; Oh and Lucas, 2006). The vendor would thus have foregone the consumer's business, although it invested into Web site trust. Therefore, if an online store achieves high levels in one dimension, it might become more valuable to the vendor to also achieve high levels in the other dimension.

Given their similarity, we expect a small interaction between Web site trust and reputation (Porter, 2008). Thus, testing for the relative importance between the two individual effects remains an important issue since many vendors might want to invest in only one of the two antecedents to trust, given the costs for establishing both Web site trust and a good reputation. Moreover, many of those vendors intending to invest in both trust-building mechanisms might want to invest in one of them first and wait for monetary returns before investing in the other. Those vendors will then have to know which antecedent to invest in first, that is, which of the two has the greater effect on vendor trust.

## OVERVIEW OF TASKS, DESIGN, AND METHODS

This study will use vendor trust as the single dependent variable, which will be regressed on two independent variables: Web site trust and vendor reputation. The independent variables will have two conditions each. These are high and low Web site trust as well as high and low vendor reputation. Vendor trust will be captured using a five-point likert-scale.

Human subjects participating in this study will be given all possible combinations (four) of conditions of the independent variables (see Figure 1) and will then be asked for their vendor trust for each of these combinations. For example, a participant might be asked how likely she would buy a specific product (e.g. a toaster) from an online store with low Web site trust on the one hand, but high reputation on the other hand. The specific design of this study will be elaborated upon in the method section.

		System/Website trust	
		low	high
Vendor Reputation	high	Rating of vendor trust on a scale ranging from 1 (very low) to 5 (very high).	Rating of vendor trust on a scale ranging from 1 (very low) to 5 (very high).
	low	Rating of vendor trust on a scale ranging from 1 (very low) to 5 (very high).	Rating of vendor trust on a scale ranging from 1 (very low) to 5 (very high).

Figure 1. General design of the tasks

## HYPOTHESES

For reasons of completeness, we will test for the individual effects of the two independent variables first, although their relationship with vendor trust has been well documented in the literature (e.g., Ba and Pavlou, 2002; Pennington et al., 2003). Thus:

*H1: Vendor reputation will be positively associated with vendor trust.*

*H2: Web site trust will be positively associated with vendor trust.*

Given the different underlying sources of trust for vendor reputation and Web site trust, we expect their effect sizes on trust to differ significantly. Specifically, as mentioned before in the theory development section, Web site trust is not directly associated with the vendor itself, but establishes vendor trust indirectly through the features of the store's Web site. Reputation, in contrast, captures direct and firsthand experiences of consumers along with the vendor's history and thus provides more specific information for potential consumers to form an impression about the store. Hence, it may be more difficult for consumers to form a favorable impression toward the store in the case of Web site trust. Therefore, we argue:

*H3: Vendor reputation will be more effective than Web site trust in improving potential customers' trusting beliefs in an online store.*

Given the low search costs on the internet (Grover and Ramanlal, 1999; Oh and Lucas, 2006), we expect Web site trust and vendor reputation to be complementary to each other, that is, to interact. As mentioned before in the theory development section, it appears reasonable that trust in a vendor's Web site is of limited value when personal experiences, vendor history, and social presence are low. Thus, we propose:

*H4: The effect of vendor reputation on vendor trust will be higher for correspondingly high levels of Web site trust.*

However, as mentioned before, we expect an only small interaction between Web site trust and vendor reputation. Thus, testing for the relative importance between the two individual effects remains an important issue.

## METHODOLOGY

### Participants

We plan for 240 voluntary participants. The study will employ a questionnaire to exclude those prospective participants whose disposition to trust is either very high or very low so as to control for participant's disposition to trust. We plan for an age range of 18 to 25 to control for possible age effects and will have the same number of males and females participate. All participants will then be tested at the same day to control for potential external effects. The ethics committee will be asked to approve the experimental protocol and we will obtain a written consent from each participant prior to conducting the tasks.

### Design and tasks

We will conduct the experiment using a randomized complete block design with two blocks including the control group. The research instrument will be a Web site that participants will visit and the data will be collected through a questionnaire that the participants are to fill out and then submit. The participants will be instructed to open carefully designed Web sites. After viewing the Web sites, they will be asked to answer the questionnaire involving their opinion regarding vendor trust. The instrument will consist of 20 different vendor Web sites: one per each combination of conditions of the two independent variables, for example high Web site trust and low vendor reputation, for five different products, that is, five replications.

Essentially, participants will visit four different Web sites per each of the five products. Those four Web sites will reflect the four different combinations of the conditions of the independent variables (see Figure 1). The Web sites will use vendor feedback rating, which is a well-established measure for vendor reputation (e.g., Ba and Pavlou, 2002; Pavlou and Gefen, 2005), to differentiate between high and low levels of reputation. The feedback rating will be shown to the participants on a scale from one star to five stars per each Web site, where more is better. Consistent with Pennington et al. (2003), five different seals, for example "Verisign" or "SafeShopping", will be used to differentiate between high and low levels of Web site trust. The different seals will be shown to the participants, where a Web site having more seals is more trustworthy. Web site trust will thus be varied by varying the number of seals shown on a site. The validity of these measures will be established using a manipulation check, as elaborated upon later in the text. The four different Web sites are described below.

- High vendor reputation and low Web site trust: This Web site will exhibit only two out of five possible different seals, but four out of five possible stars for feedback rating.
- High vendor reputation and high Web site trust: This Web site will exhibit four out of five possible different seals and four out of five possible stars for feedback rating.
- Low vendor reputation and high Web site trust: This Web site will exhibit four out of five possible different seals, but only two out of five possible stars for feedback rating.
- Low vendor reputation and low Web site trust: This Web site will exhibit only two out of five possible different seals and only two out of five possible stars for feedback rating.

The participants will visit the full set of four Web sites five times, once for each product. We will replicate the experiment using the following products: a plasma TV, a toaster, a stereo, a notebook, and a hand calculator. All products are gender-neutral. They are also brand-neutral to account for the possible trust transference of brand names to vendors.

The subjects will have to rate their perceived vendor trust on a likert-type scale ranging from 1 (Fully disagree) to 5 (Fully agree) for each combination of conditions of the independent variables. The following three items, which are adapted from Pennington et al. (2003), will have to be answered:

"Do you agree or disagree with the following statements:

1. This vendor very much appears to be one who would keep promises and commitments (would deliver goods as expected).
2. I feel very confident buying this product from this vendor.
3. I am very suspicious of this vendor."

The participants will also fill out questionnaires pertaining to the perceived Web site trust and vendor reputation per each Web site so as to enable a manipulation check. This allows us to compare the participant's perceptions of the levels of Web site trust and reputation of each Web site with our own conceptualization of the Web site. For the manipulation check, the participants will have to rate vendor reputation and Web site trust on a likert-type scale ranging from 1 (Fully disagree) to 5 (Fully agree). The following items, which are adapted from Pennington et al. (2003), will have to be answered for Web site

trust and vendor reputation. The first three questions refer to Web site trust, while the subsequent items are meant to capture vendor reputation:

“Do you agree or disagree with the following statements:

1. Based on the appearance of this Web site, I very much believe this is a legitimate vendor.
2. I am very suspicious of this Web site.
3. On this Web site, I very much believe the proper technology has been put into place that would assure me of an error-free transaction (this Web site is functional).
4. This vendor has a very good reputation for being concerned about its customers.
5. This vendor has a quite bad reputation in the market.
6. The reputation of this vendor is very good.”

### Procedure

On arrival for their session, the voluntary participants will receive information on the experimental protocol and they will provide a codified consent. Afterwards, the participants will receive instructions on how to complete the tasks and to respond as quickly and accurately as possible to the survey items. Eventually, they will evaluate vendor trust, in counterbalanced order, with ten participants randomly assigned to each of the 24 permutations of the four conditions of vendor trust. When visiting those Web sites, they will also answer the appropriate questionnaires for the manipulation check. Finally, the participants will be debriefed.

Subsequently, the data will be analyzed using structural equation modeling, which allows us to test for significant differences in the effects of the two predictors by imposing constraints on the model (Byrne, 2006). Regarding the interaction effect of vendor reputation and Web site trust, we will conduct a test of simple slopes to further understand the interaction if the interaction main effect turns out to be significant. This follow-up test will then allow us to determine how exactly the effect of vendor reputation on vendor trust varies for different levels of Web site trust.

### EXPECTED RESULTS

Based on the grounding of our study in existing literature and the logical deduction of the hypotheses, we expect all of our hypotheses to be supported (see Table 1). Specifically, we expect the following results for our hypotheses:

<i>Hypothesis</i>	<i>Supported / not supported</i>
Hypothesis 1	Supported
Hypothesis 2	Supported
Hypothesis 3	Supported
Hypothesis 4	Supported

**Table 1. Expected support for hypotheses**

A support for all of our hypotheses implies the following effects:

- H1: A positive effect of vendor reputation on vendor trust.
- H2: A positive effect of Web site trust on vendor trust.
- H3: A higher effect of vendor reputation than Web site trust on vendor trust (see Figure 2).
- H4: A small positive interaction effect (see Figure 3).

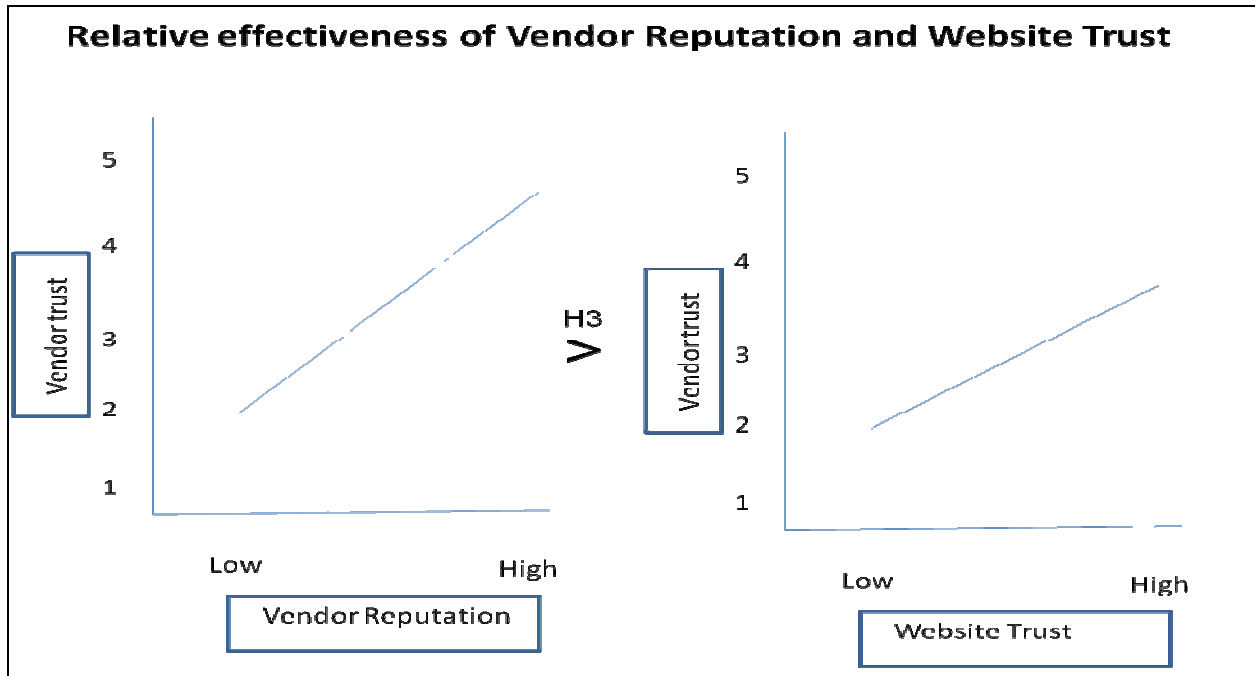


Figure 2. Results expected for Hypothesis 3

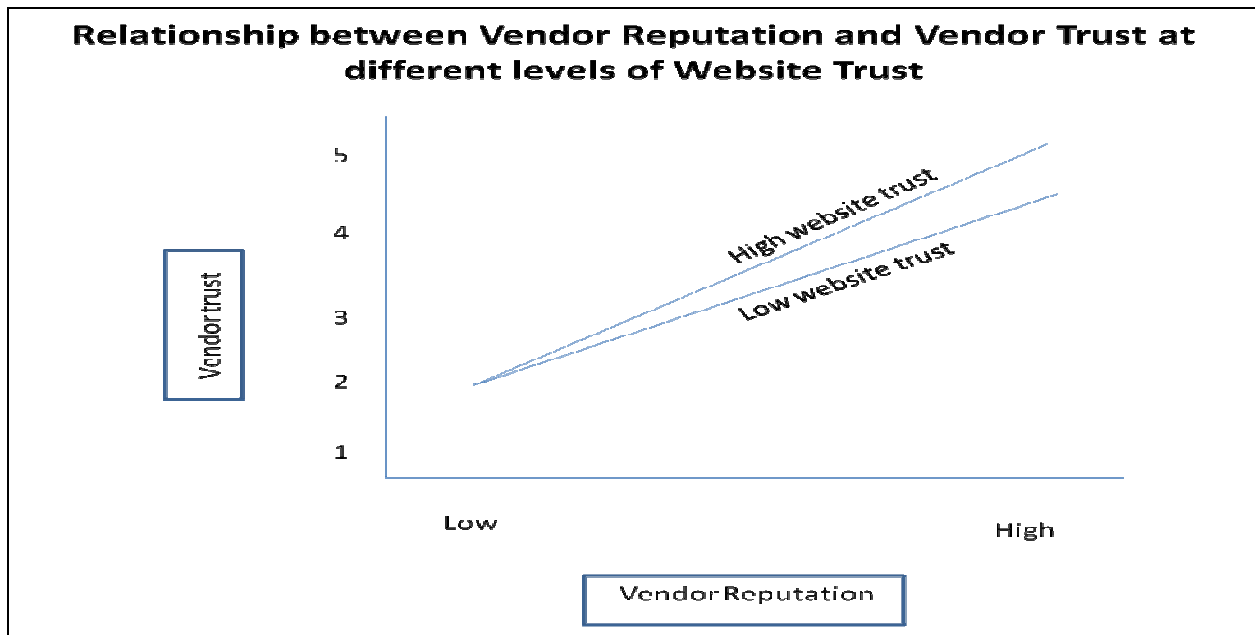


Figure 3. Results expected for Hypothesis 4

Two aspects deserve mentioning. First, regarding the expected results for hypothesis 4, please note that the lines in figure 3 are not exactly parallel, but exhibit a small difference, that is, the slope for vendor reputation is slightly steeper for high Web site trust. Second, we will provide the percent of variance explained along with the significance level for each hypothesis.



## CONCLUSION

Given our expected results, this study will extend the literature on trust in two important ways. First, people feel different levels of trust for different trust-building mechanisms. Specifically, by the means of our study, it will have been found that firms should focus more on reputation than on Web site trust if they are not implementing both mechanisms simultaneously. This finding enables online sellers to better leverage their investments in trust-building mechanisms. This is particularly true if firms decide to implement only one mechanism and thus forego the benefits of the interaction effect due to the cost associated with its implementation.

Second, if vendors have enough monetary capital at hand to implement both trust-building mechanisms, they can leverage a small interaction effect of Web site trust and vendor reputation that will lead to greater trust than the sum of the two individual effects. In conclusion, the study refines existing literature on trust and raises awareness of the importance of a deeper understanding of existing trust-building mechanisms.

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