

## **Critical Success Factors for Stock Brokerage over the Internet: An Exploratory Study in the Brazilian Market under the Perspective of the Investor**

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### **Abstract**

*The aim of this study is to investigate, using the perspective of the investor, the determinant factors for the success of the stock brokerage process over the Web, using financial portals on the Brazilian Internet. A framework of the online stock trading process is presented in order to compare the traditional form of stock brokerage with that made possible by the Internet and to discuss some of the issues regarding the intermediation and desintermediation that occurs during the process.*

*The conclusions were obtained from a survey, conducted with Brazilian investors that operate using Internet stockbrokers for the intermediation of their stock operations. The findings showed that the Critical Success Factors for online stock trading in the Brazilian market relate more to fundamental issues, like ease of use, security and brokerage costs, than with more sophisticated services, like active monitoring of stock prices. At the same time, areas for further research will be identified and proposed.*

### **1. Introduction**

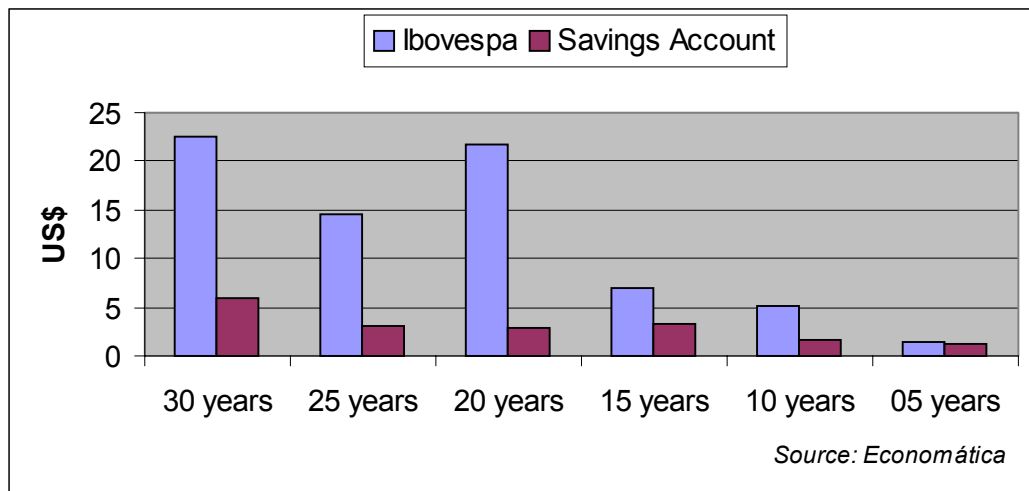
The objective of this paper is to develop an exploratory study that will identify some of the Critical Success Factors (CSF) for stock brokerage over the Internet in the Brazilian market. The findings described are based on a survey that has been conducted with a group of investors who use Brazilian financial portals for trading stocks and are discussed using the perspective of the investor, i.e., what do they perceive to be the determinant factors for the success of the stock trading process over the web.

Following this introduction, section two will develop a contextualization of the problem, in order to discuss relevant factors in the Brazilian and worldwide stock markets within the context of this study. Section three will present the theoretical framework where the differences between traditional and online stock trading will be examined and where the intermediation and desintermediation concepts will be discussed. Section four briefly

discusses the methodology used in the research. Finally, section five presents the findings of the survey followed by the conclusions of this study in section six.

## 2. Contextualization of the Problem

After the stabilization of the Brazilian economy in the mid-90's a new reality was presented to Brazilian Investors. Previously, the high inflation rates determined preferences toward investment strategies attached to low risk assets, and the main target was to protect financial assets from corrosion caused by inflation. However, a stable economy made it necessary for investors to find new investment alternatives and in response to this the Brazilian investor has started to migrate to the stock market to look for higher return rates (Fortuna, 1999). Halfeld (2000) strongly supports this change in the investment strategies of the Brazilian investor, by presenting a study developed by *Economática*, a Brazilian financial institute, that compares the gains obtained by a hypothetical Brazilian investor, in various timeframes, who had invested US\$ 1.00 in the Brazilian stock market in a portfolio similar to that one used in the IBOVESPA index (the index of the largest Brazilian stock market), with another one who supposedly invested the same amount in a traditional savings account. The comparison can be seen in graph 1 below and the analysis of this study makes it possible to clearly observe the higher returns provided by the stock market, which are mainly in the long term.



**Graph 1:** Gains on US\$ 1 Invested in the Brazilian Stock Market and in a Savings Account in Different Timeframes

At the same time, the use of the Internet exploded in Brazil and all over the world and in addition to the rapidly growing number of people connected to the network, one of the sectors that witnessed the most fundamental improvements in Brazil was the financial market. Halfeld (2000) states that due to the progressive availability of better services and the lower costs of transactions made over the Internet and in relation to the fast uptake of the large consumer banks, a significant part of the population started operating its bank accounts using the new channel. Actually, as suggested by Albertin (2001), the Internet is now part of the everyday life of a large part of the population.

Finally, an important event in the context of this research was the creation of the home-broker system in the biggest Brazilian stock market, the *Bolsa de Valores do Estado de São Paulo – BOVESPA*. Before the home-broker system, stock trading used to be done through trading societies which used to act as the bridge between the investor and the stock market, and most of the transactions were conducted using a conventional phone line. After March of 1999, the home-broker system delivered to the investor the possibility to issue trading orders directly over the Internet to a broker, and to follow it up on a real time basis using the network (BOVESPA, 2001).

These three factors taken together – the stabilization of the Brazilian economy; the explosion of the Internet; and the launch of the home-broker system in the Brazilian stock market – were determinants for the emergence of the financial portals on the Brazilian Internet.

At the same time, the process of trading stocks over the Internet has been growing all over the world. As an example, Prabhudev *et al.* (2000) states that the stockbrokers operating over the Internet in the North-American market attracted a contingent of 12 million investors since the launch of this service in 1994. These investors were also responsible for 33% of the stocks traded in the US market in the year 2000. Barber e Odean (2001) present in their work a study developed by Cerulli who estimated that 42 million investment accounts will be opened by private investors in the on-line stock brokers in the USA. Fan, Stallaert and Whinston (2000) also discuss the expansion of online investments in the USA based on projections made by Jupiter Communications according to which the online brokerage market will reach \$3 Trillion by 2003.

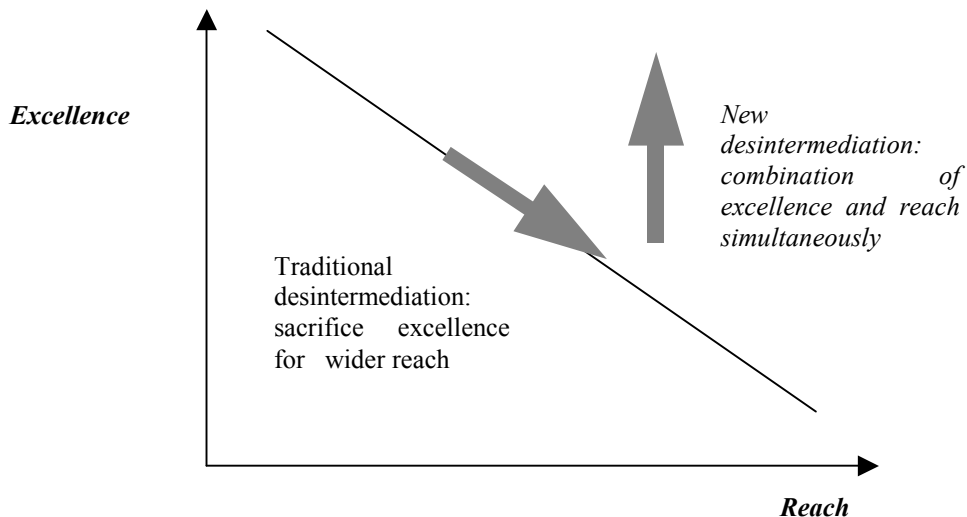
### **3. Theoretical Reference**

#### **3.1 Intermediation and Desintermediation in Electronic Commerce**

According to Evans and Wurster (2000), intermediaries usually make their profit based on an exchange between excellence and reach. In the first case the profit is obtained based on a differentiated service with high levels of excellence, which are usually superior to the levels that could usually be delivered straight to the final consumer without the intermediary's participation. In the case of the value extraction based on reach, the intermediaries exploit their capacity of reaching a higher number of customers to make their profit.

With the growing use of the new technologies by the companies targeting the practice of electronic commerce, some have argued that this would be the end of the intermediation (Carr, 2000). However, according to Evans and Wurster (2000), a more correct approach would be to view these changes as a path to the emergence of a new kind of intermediary, which can take advantage of a new form of desintermediation, as shown in figure 1 below.

Evans and Wurster (2001) go further in explaining these ideas, by arguing that, in the history of desintermediation, usually the new competitors compete with the intermediaries who are already in the market and who offer a wider reach but neglect excellence. Typically, different versions of the same product or service are offered, characterizing a proposition with different value but not necessarily higher value.



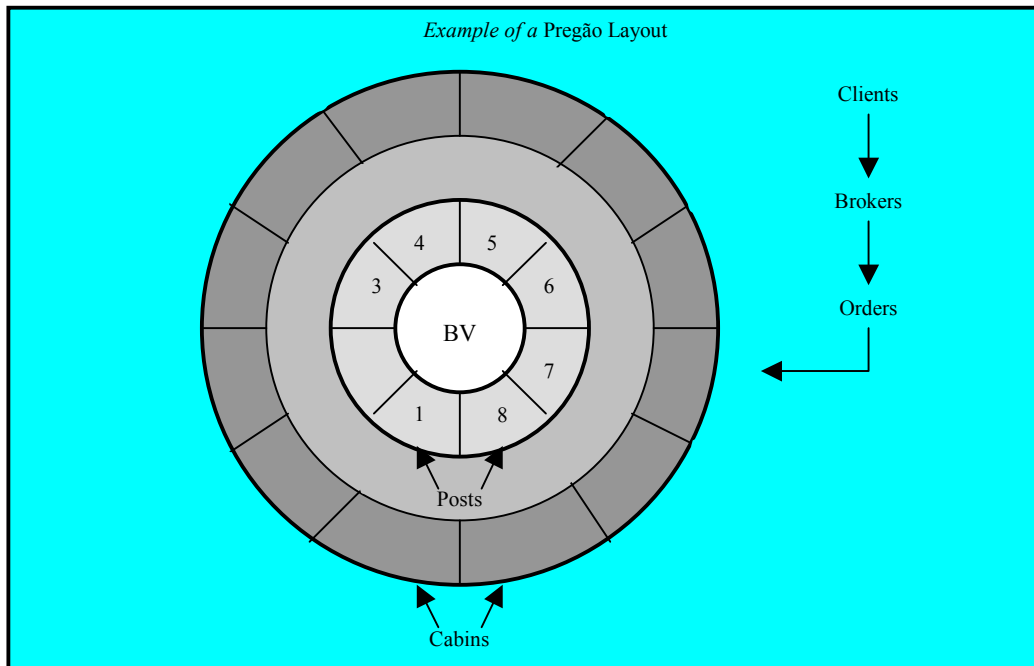
**Figure 1:**

Source: Evans and Wurster (2001:70)

In the new form of desintermediation proposed by the authors, a more radical event occurs when the technology makes it possible to alter the whole curve, i.e., competitors offer a wider reach at the same time as they offer more facilities and resources to the customer. According to Evans and Wurster (2001), this is exactly what happened in the North American stock trading market. New players such as Charles Schwab, took advantage of the possibilities provided by the Internet and amplified their reach, while at the same time delivering to the customers a full range of products and services that related to the stock trading process and which were not available previously.

### **3.2 The Stock Market in Brazil**

The stock trading process in the Brazilian market requires intermediation by brokerage societies, which are responsible for taking the clients' orders so that they can execute them in the market. These orders are executed in a place called the *Pregão*, which is the Portuguese expression used in Brazil to denote the place where the agents of the brokerage societies come together to execute the orders received from their clients (Pinheiro, 2001). Only registered agents have access to the *Pregão* and around it are distributed tables and cabins owned by the brokerage societies. Each of the societies transmits to their agents in the *Pregão* the orders that must be executed. After receiving the order, the agents look for the post that corresponds to specific stocks and then tries to execute them. This mechanism is represented in figure 2 below:

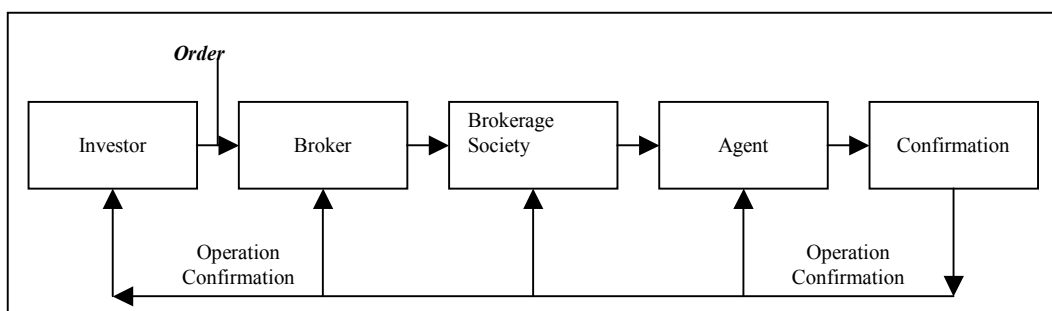


**Figure 2:** Example of a Pregão Layout

Source: Pinheiro (2001)

### 3.3 Stock Trading in the Real World vis-à-vis over the Internet

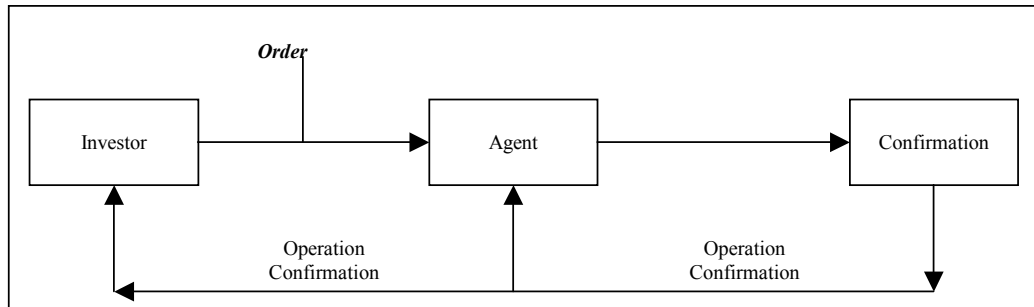
Every process of investment in stocks includes four steps: (i) the trading order by the investor; (ii) the routing of this order for execution; (iii) the establishment of the price; and finally, (iv) the execution of the order (Dasgupta and Dickinson, 1999). In the traditional model of brokerage, the investor calls a broker by telephone. The broker receives the order and transfers it to the brokerage society. The society then routes the order again to the agent who will try to find the best offer for the execution of the order (Sharma and Bingi, 2000). Figure 3 below illustrates the process:



**Figure 3:** Trading Process – Traditional Brokerage Model

Source: Sharma and Bingi, 2000

The same transaction in the electronic system presents the following configuration, as described by Sharma and Bingi (2000) and presented in figure 4 below: the investor places the trading order directly through his computer; the order is routed by the brokerage society's system directly to the agent that will arrange the price and execute the order using the best possible offer.



**Figure 4:** Trading Process – Web-based Brokerage Model

Source: Sharma and Bingi, 2000

The analysis and comparison of the two models presented shows that the operation realized using the traditional model has a minimum of two additional intermediaries. The elimination of these two steps helps to decrease the costs involved in the transaction, and this reduction is usually transferred to the investor (Sharma and Bingi, 2000).

Beside the cost reduction, the online process also provides the investor with other advantages. Cotsakos (2001) describes some of the tasks that can be realized by the investor using the online operation:

- i. To analyze preferred stocks in any market, by any index;
- ii. To analyze stocks' performance using graphic tools;
- iii. To compare prices and information of two or more stocks at the same time;
- iv. To research the financial situation and the historical profitability of a specific company or sector;
- v. To access up to date reports that have been generated by specialists.

#### 4. Research Methodology

This work can be described as an exploratory study due to the scarcity of research and published material on the issue proposed. The methodology was based on a survey, conducted with investors on the Brazilian Internet, using an online questionnaire published on the web at the time of the data collection. According to Blaxter, Hughes and Tight (2001:77), "surveys are usually associated as a research approach with the idea of asking groups of people questions". This appears to be the most useful approach for this work, once its findings have been based on investor's opinions about the Brazilian online stockbrokers.

The population parameters for the research can be described as a group of private individuals who have used Internet portals for trading stocks online. Due to the difficulty

of identifying these individuals, a non-probabilistic approach was used to select a sample, based on the definitions of Rea and Parker (2000). This approach can be seen, as having a lower degree of scientific strictness, yet it is also a very useful tool for the researcher. This statement is based on the fact that this kind of non-probabilistic approach can quickly generate a preliminary comprehension of the key questions in a piece of research, while allowing the researcher to refine his research instruments (Rea and Parker, 2000).

The non-probabilistic sampling strategy used has been defined by Rea and Parker (2000) as snowball sampling. They describe this technique as being particularly useful when it is hard for the researcher to identify potential respondents. After the identification of some respondents, they are asked to indicate other individuals that could answer the questionnaire and this process is used until the sample is complete. Another useful definition of this technique is given by Kumar (1999:162), according to whom “snowball sampling is the process of selecting a sample using networks”.

The sample size was defined based on statistical criteria, with a 95% confidence level and a tolerated error of 5%. Based on Rea and Parker (2000:128), the minimum sample size for a survey with these characteristics is 97 individuals, therefore, this is the minimum number of individuals to be interviewed in the data collection.

As stated before, the target of this research is to investigate the Critical Success Factors (CSF) for the process of trading stocks over the Internet using the perspective of the investor. The main questions this research purports to answer are:

- What are the CSF's in the selection of an electronic stockbroker by the investor?
- What CSF's relate to the quality and quantity of information available for the investor by using electronic stockbrokers?
- What are the CSF's regarding the resources available for the investors using electronic stockbrokers?
- What are the CSF's that relate to the ease of use of the tools available on the electronic stockbrokers?
- What are the CSF's that relate to the alternatives provided to the investor in order to establish and maintain its relationship with the electronic stockbroker?
- What are the CSF's regarding the investor's concerns about security?
- What are the CSF's regarding the costs involved in the trading process for the investor?

## **5. Data Collection and Analysis**

The survey was conducted with a sample of 100 individuals in the first semester of 2002. The data collected was treated with the statistical software Sphinx Léxica, version 2.09 the analysis of which was used to form the conclusions presented in this section.

The findings described are presented based entirely on the findings of the survey conducted with the sample described before. In a general way, these findings did not present any relationship with other variables related to the investor profile (e.g. prior experience in the stock market, gender or time spent using the home-broker system), once the potential relationships were investigated through the use of cross tabulations and statistical tests and no relationships could be identified. Therefore, it is possible to conclude that the findings presented can be attributed to the whole sample independently of any specific attributes.

The questionnaire was planned with three objectives. First, identify the profile of the investors that were included in the sample. Second, based on a single multiple answer question, directly ask the investors about the critical factors for them when selecting an online stockbroker. Third, conduct a further investigation based on the use of a summated rating scale, or Likert scale, to identify the perception of the investors about different variables and aspects. The scale used was a five-point, three-directional categorical scale, where the variables were rated as 'non-important', 'low importance', 'indifferent', 'important', and 'very important'. For the selection of the Critical Success Factors, the criteria adopted was to consider as critical the factors which were classified as important or very important by more than 70% of the respondents.

### **5.1 The Investor Profile**

The analysis of the investors' profile showed the following characteristics:

- 45% of the sample have invested on the stock market for more than one year, with the other 55% being less experienced with this kind of investment;
- The home-broker system looks to be an important factor in the attractiveness of new investors to the stock market, because 61% of the investors in the survey started their operations with this kind of investment after the creation of this system;
- The sample can be divided almost equally between small and large investors, as suggested by the percentage that 49% invest amounts smaller than R\$ 10,000 (approximately € 4,000 at the date of the survey);
- Regarding their objectives, 54% of the investors in the sample have a medium/long term horizon for their investments against 46% who can be considered short-term investors and speculators;
- 67% of the individuals have a portfolio with no more than five different companies with this proportion growing to 95% if we consider the individuals whose portfolios have 15 companies. This reveals a tendency toward low diversification in the Brazilian investor's portfolio;
- A very significant percentile (74%) of the sample relies on the information provided by their stockbrokers to obtain information about the market and opportunities for investment. However, other online stockbrokers (66%), financial newspapers (55%) and general sites on the Internet (41%) also appeared with a elevated frequency.

### **5.2 The Critical Success Factors in the Selection of an Electronic Stockbroker**

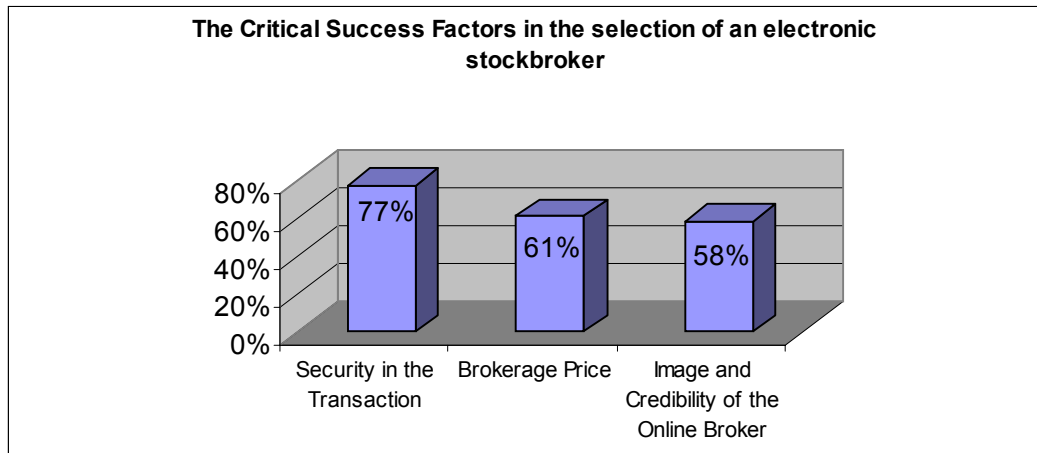
In order to determine the critical factors in the selection process of an online stockbroker, a multiple answer question was used where the following factors could be rated as relevant or not by the investors:

1. Image and credibility of the online stock broker
2. Security of the transaction
3. Level of information available on the online stockbroker
4. Response time of the online broker's system



5. Brokerage rates
6. Protection of the investor's privacy
7. Relationship channels available to contact the online broker
8. Offer of free Internet access for the clients
9. Association of the online stock broker with a large retailing bank

According to the survey, three items were considered more relevant, as can be seen in graph 2 below:



**Graph 2:** The Critical Success Factors in the Selection of an Electronic Stockbroker

### 5.3 The Critical Success Factors Regarding Information Available on Electronic Stockbrokers

The survey demonstrated that the Brazilian investor does not tend to attribute a high level of importance to the quality or the quantity of information available on the Brazilian online stockbrokers, despite the fact that this is a frequent source of information for them, as stated before. Among the variables investigated, as shown in table 1 below, none were ranked as being critical using the perspective of the investors.

**Table 1:** Evaluation of the Critical Success Factors for the Online Brokerage Process Regarding to the Information Available on the Electronic Stockbroker

Variable	% of positive evaluation
Quality of information available about investments through online stock brokers	65%
Quantity of information available about investments through online stock brokers	47%
Availability of online courses and tutorials for auto-instruction	45%
Availability of games and simulations for practice and learning about the home-broker mechanism	42%
Availability of online courses with attendance by a consultant	28%

The only aspect that scored highly was that regarding the quality of information available, but even so, this amount was not enough for consider it as a Critical Factor, according to the criteria defined previously.

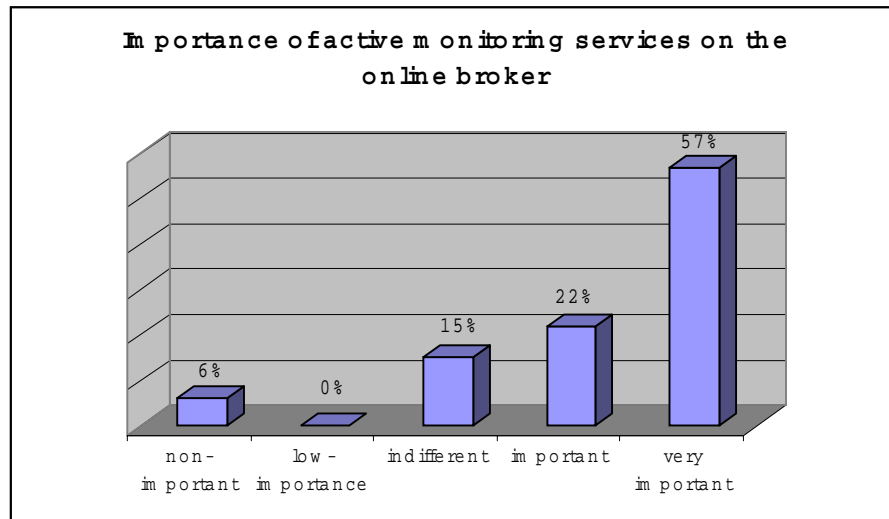
#### 5.4 The Critical Success Factors Regarding Resources Available at the Electronic Stockbrokers

This was the group where more variables were investigated and therefore, is also the section where more critical factors could be identified. The variables investigated regarding the resources available at the online broker were the following:

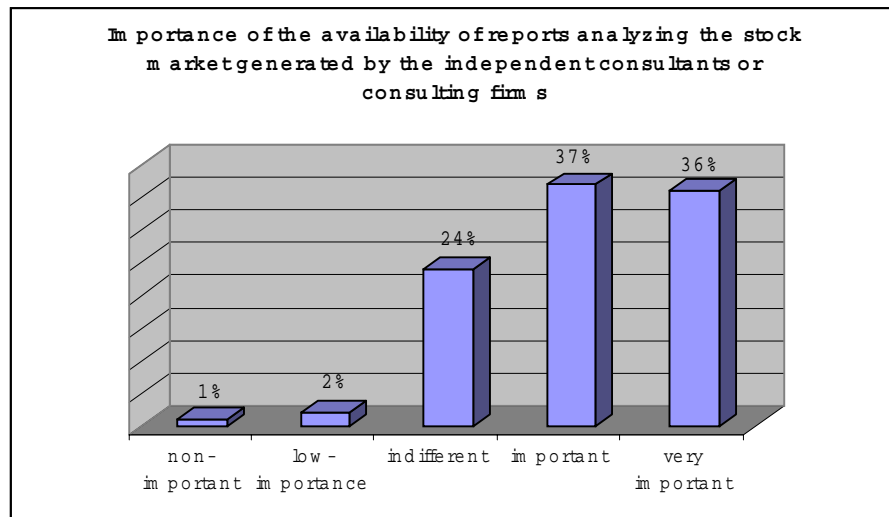
**Table 2:** Evaluation of the Critical Success Factors for Online Brokerage Process Regarding to the Resources Available to the Investor on the Electronic Stockbroker

Variable	% of positive evaluation
Active monitoring of the stock prices with warnings sent to the investor according to pre-defined parameters	79%
Availability of reports analyzing the stock market generated by independent consultants or consulting firms	73%
Availability of graphical information about the stock market generated by the online broker	71%
Availability of graphical information about the stock market generated by independent consultants or consulting firms	69%
Availability of reports analyzing the stock market generated by the online broker	64%
Periodic newsletters sent by e-mail with stock prices and market information	62%
Recommendations about specific stocks and strategies elaborated by independent consultants or consulting firms	57%
Recommendations about specific stocks and strategies elaborated by the online broker	51%
Availability of reports about the macro-economic scenario generated by the online broker	49%
Availability of reports about the macro-economic scenario generated by independent consultants or consulting firms	49%
Availability of tools to elaborate simulations and projections about return on investment	44%

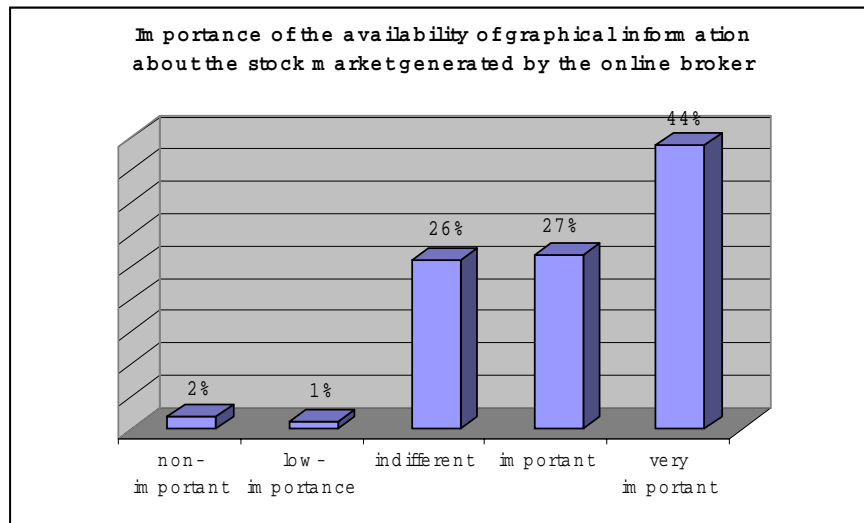
Graphs 3, 4 and 5 below show the level of importance attributed to the variables considered as critical:



Graph 3: Importance of the Availability of an Active Monitoring Service



Graph 4: Importance of the Availability of Reports Analyzing the Stock Market Generated by Independent Consultants or Consulting Firms



**Graph 5:** Importance of the Availability of Graphical Information about the Stock Market Generated by the Electronic Stockbroker

### 5.5 The Critical Success Factors Regarding the Ease of Use of the Tools Available on the Electronic Stockbrokers

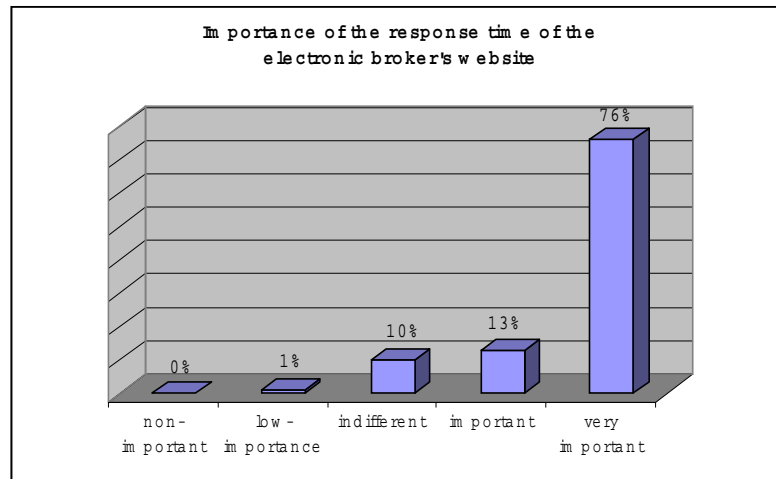
In this section, all the variables were classified as critical by the investors that took part in the survey, as can be seen in table 3 below:

**Table 3:** Evaluation of the Critical Success Factors for the Online Brokerage Process Regarding the Ease of Use of the Tools on the Electronic Broker

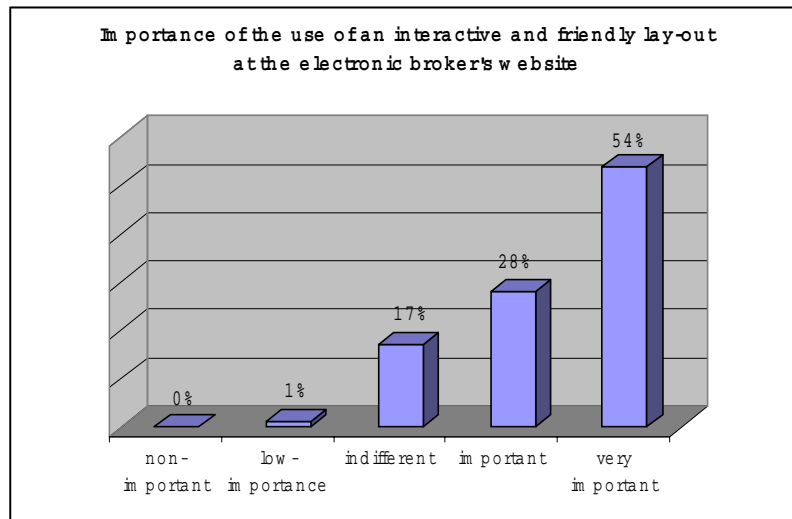
Variable	% of positive evaluation
Response time of the electronic broker's website	89%
Use of an interactive and friendly lay-out at the electronic broker's website	82%
Use of an interface simple and intuitive at the electronic broker's website	82%

Besides the fact that all the variables were marked as critical, this section also carries the factor that received the highest evaluation by the respondents. The response time of the electronic broker's website was considered the single most critical factor. What is important to observe is that the ease of use is not related to the experience of the user, as one could suppose (more experienced users could rank this aspect as less important than less experienced ones) because there is no dependence between any of these variables, as explained before.

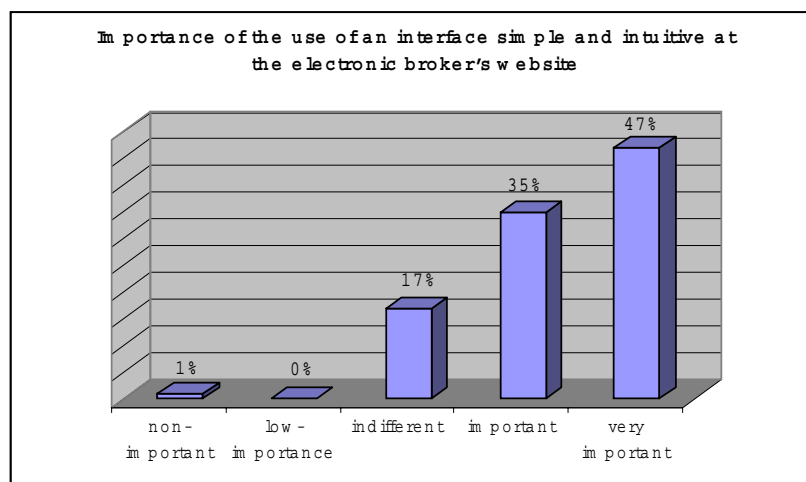
The individual values for each of the variables in this section can be seen in graphs 6, 7 and 8 below:



Graph 6: Importance of the Response Time of the Electronic Broker's Website



Graph 7: Importance of the Use of an Interactive and Friendly Lay-Out at the Website



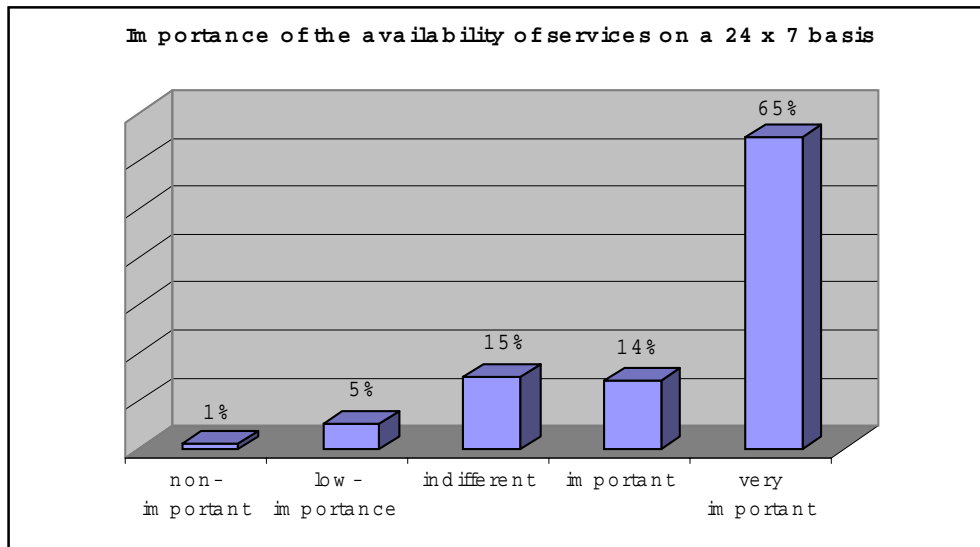
Graph 8: Importance of the Use of an Interface Simple and Intuitive at the Website

### 5.6 The Critical Success Factors Regarding the Alternatives for Establishing a Relationship with the Electronic Stock Brokers

Four variables were investigated in this section, as presented in table 4. The only one ranked as critical was the “availability of services on a 24 x 7 basis”. This fact shows coherence with one of the most important benefits for the consumer made possible by the Internet, which is to present to the consumer the possibility of buy and make transactions 24 hours a day, from virtually anywhere (Turban *et al.*, 2000). The specific values for this critical factor are shown in graph 9.

**Table 4:** Evaluation of the Critical Success Factors for the Online Brokerage Process Regarding the Relationship Possibilities with the Electronic Stockbroker

Variable	% of positive evaluation
Availability of availability of services on a 24 x 7 basis	79%
Availability of consultants for interaction through telephone	55%
Availability of consultants for interaction through “chat”	42%
Existence of investors communities around and supported by the online broker for exchange of ideas and opinions about investments and the market	41%



**Graph 9:** Relative Importance of the Availability of Services on a 24 X 7 Basis

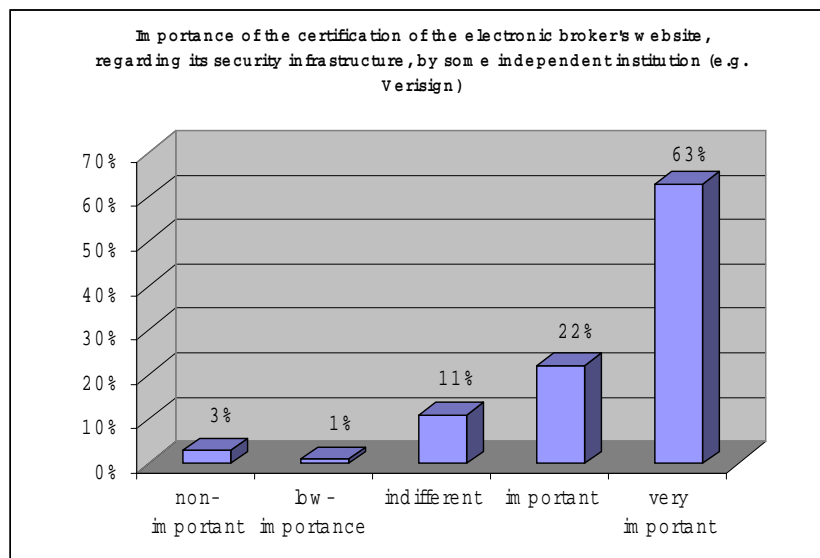
### 5.7 The Critical Success Factors Regarding to the Security Provided by the Online Stock Broker

This group of factors was ranked as the single most important factor in the process of choosing an online stockbroker, as presented in section 5.2, and the further investigation conducted with the variables related to this issue confirms this investor’s perception. As presented in table 5, 85% of the respondents classified the security certification of the electronic broker’s website as an important or very important aspect, and 63% of these

observations ranked as very important (graph 10). This makes evident the necessity for electronic brokers to take security issues seriously because they are a fundamental concern.

**Table 5:** Evaluation of the Critical Success Factors for the Online Brokerage Process Regarding to the Security Provided by the Electronic Stockbroker

Variable	% of positive evaluation
Certification of the electronic broker’s website, regarding its security infrastructure, by some independent institution (e.g. Verisign)	85%
Association of the online broker with a large retailing bank	60%



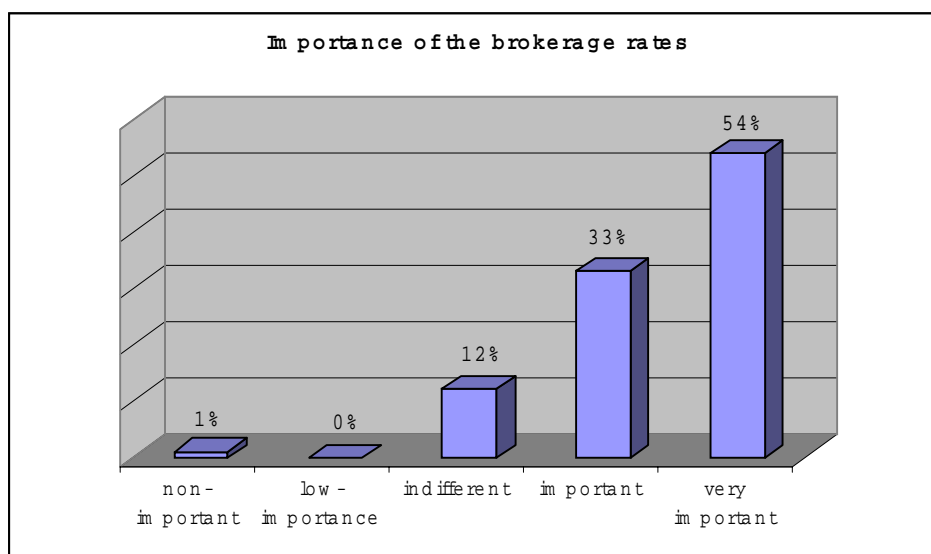
**Graph 10:** Relative Importance of the Availability Certification of the Electronic Broker’s Website, Regarding Its Security Infrastructure, by Some Independent Institution (E.G. Verisign)

### 5.8 The Critical Success Factors Regarding the Brokerage Costs

Brokerage costs also appeared on the top of the list of critical factors for choosing online brokers, having “brokerage rates” that were often attributed as “important” or “very important”, as shown in table 6 and in graph 11 below.

**Table 6:** Evaluation of the Critical Success Factors for the Online Brokerage Process Regarding the Brokerage Costs

Variable	% of positive evaluation
Brokerage rates	87%
Availability of a free-tool line for contacting the online broker	66%
Offer of free Internet access for clients of the online broker	37%



**Graph 11:** Importance of the Brokerage Rates

## 6. Conclusions

As stated before, this work must be seen as an exploratory study. Therefore, its findings are not intended to be conclusive, but they do try to illuminate some issues related to the subject of “online stock brokerage over the Internet”. As an exploratory study, higher levels of details or deeper analysis of specific issues can not be expected. However, some relevant observations can be seen in the results of the survey. The groups of factors where some of the critical factors investigated were considered as being more critical than others related to the ease of use of the broker’s website, security concerns and brokerage costs, as presented in table 7 below. These findings corroborate the findings of the second section of the survey, where the investors were asked directly about the critical factors in the process of choosing an online stockbroker, presented on graph 2 of section 5.2.



**Table 7: More Important Critical Factors for the Success of the Stock Brokerage Process over the Internet Using the Investors' Perspective**

<b>Group</b>	<b>Critical Success Factors</b>	<b>Positive Evaluation</b>
Ease of use	Response time of the broker's website	89%
Ease of use	Use of an interactive and friendly layout at the electronic broker's website	82%
Ease of use	Use of an interface simple and intuitive at the electronic broker's website	82%
Security	Certification of the electronic broker's website by independent organizations	85%
Brokerage costs	Brokerage rates	87%

It is important to observe that the factors presented as more critical by the investors, reinforce the fact that investors are still getting used to operating through online brokers in the Brazilian market. This statement is based on the fact that most of the Critical Success Factors identified on the survey reflect concerns about fundamental questions, e.g. security and price, to the detriment of more sophisticated services. If on one hand we can deduct that the success of the electronic stockbrokers can be dependent on how professionally and efficiently the simplest issues are taken, on the other hand we can reflect that this market is still evolving. This tendency can be confirmed by the information in table 2, where the "active monitoring service of the stock prices with warnings being sent to the investor according to pre-determined parameters" was considered important or very important by 79% of the respondents. Therefore, as the market keeps evolving, the relative importance for more sophisticated services often tends to become higher. This will certainly pressure online stockbrokers to find ways to differentiate their service from each other.

Finally, the study also intends to contribute by providing directions for additional research that is necessary to continue exploring the issues discussed here. Further research is recommended in other countries and markets where online stockbrokers are operating, in order to initiate the construction of wider knowledge about the online investor's profile and its needs. At the same time, segmented investigation could be conducted to investigate additional relationships between the factors considered as critical and variables not considered in this study, like geographical location or investor's income.

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