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PhD. In Economics

# **TITLE: THEORY AND POLICY OF COMPETITION IN WEB BASED BUSINESS**

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## List of Publications

1. Iulian Caraganciu – “An Approach towards the problem of competition stability. Application: e-Commerce companies Amazon and e-bay”, IMINOVA University, Chisinau, Moldova Republic of
2. Iulian Caraganciu, Livia Oltean – “Financing Sources for Small and Medium-Sized Enterprises” – Revista Economica, Issue 2, 2011, p121-125
3. Iulian Caraganciu, Dicoi Daniel – “The Phenomenon of Shadow Economy within Different Countries” – Revista Economica, Issue 5, 2011, p215-219
4. Iulian Caraganciu – “Defining the Coordinates of the web market in nowadays business” – Revista Economica, Supplement Nr 3, 2012
5. Iulian Caraganciu – “Describing the Web Based Business by the content of its segments” – ICEA – FAA 2012, Bucharest, Romania, Conference Proceedings
6. Iulian Caraganciu – “Market Theories Analysis for the web Market and Incorporation of Reputation as a competitive factor for web companies” – Studies in Business Economics, Sibiu, Romania, Vol. 8.1
7. Iulian Caraganciu – “Competition on the web market both against other web based market companies and against their real market analogues”, International Journal on Digital Economy, Accepted for Publishing, Pending
8. Iulian Caraganciu – “Competition on the web treated by the Economics of Networks” - *The International Journal of Management Science and Information Technology*, Accepted for Publication, Pending
9. Iulian Caraganciu – “APPLICATION OF VANIN MODEL FOR THE WEB MARKET”, ICEA-FAA 2013, Bucharest, Romania, Conference Proceedings
10. Iulian Caraganciu – “Inapplicability of the Ordinary Least Square Method for the web. Theoretical Concepts” – Revista Economica, 2013, Accepted for publishing, Pending

## **Abstract for the PhD Thesis with the title “Theory and Policy of Competition in Web based Business”**

The doctorate thesis, entitled “Theory and Policy of Competition in Web based Business”, consists of 6 chapters. The structure of these chapters is as follows:

- Chapter 1, entitled “Web market segments’ presentation and classification”, has the role of presenting the segments that make up the entire web market as well as presenting the source of their revenue. In this chapter will be presented how competition between a web company and a real market company takes place as well as how competition takes place between two web companies.
- In chapter 2, entitled “Economic theory analysis for the web and the inapplicability of such”, we will be presenting classic market theories starting with Adam Smith and up until the Chicago and Harvard Schools of economic thought, as well as we will be presenting some aspect why these cannot be applied to describe the web market. As the classic theory doesn’t provide us with an answer about how the web market behaves we will try to use reputation as to describe customer incentives to buy from a certain company and not the other. In this chapter we are going to present the concept of reputation and the way country’s reputation and company’s reputation in that country can play a role when going abroad.
- Chapter 3, entitled “Market Power and Relevant market analysis models”, has the role of presenting the concept of market power as well as the relevant market. This chapter is important in order to illustrate the tools which are frequently used to determine the aforementioned market power and the relevant market.
- Chapter 4, having the title “Market models and Market analysis Tools”, presents market models as well as market analysis tools. In this chapter the market analysis tool presented is the Ordinary Least Square method and we

also try to show some theoretical concepts about why the latter cannot be applied accurately for the web market.

- Chapter 5, entitled “Web market models and a 5 stage reputation-awareness game for modeling the web market”, contains web market models and the classification of such, it has the role of familiarizing the reader with how the web is treated by researchers. This part also contains an adaptation of Vanin 4 stage reputation game, for the web, by introducing the awareness coefficient into the game model.
- In Chapter 6, entitled “Web market analysis through the prism of Economics of Networks”, we have presented the concepts related to the economics of networks which are necessary in order to understand the country rank model, presented in this chapter. The country rank model is a model which has a use in establishing the market of competitive collusion between two e-commerce companies.

Further we will present the importance of the topic.

Web based business is a growing sector in the modern day economy. It is divided into multiple sectors. Its sheer size is constantly growing with the increase in numbers of internet users all around the globe. The market itself is different from the real market in some key aspects.

The aforementioned aspects include firstly web market company revenue can be generated by something called traffic, which would be the analogue of rating for a TV show or the placement of a commercial banner in a real market. This traffic basically shows the amount of visitors for a website as well as the time they spend on this website. (The time spent on a website can be detected via traffic web page size ratio.)

Another aspect that is specific to the web market is donations, which are frequent in some sectors of the web based business. This type of revenue for a website is based on the consumers’ desire to support a certain possibly free service or product. Mainly game or gambling web companies support this type of behavior.

An important aspect that is not to be forgotten is the fact that web market goods that are generated for the web or network usage, behave differently in terms of economy

of scale, since the main cost of these products is the development process itself and the costs to replicate and reproduce for sale purposes tend to zero.

The main premise of this thesis is based around the difficulty for accurately determining the relevant market for web based business as well as the existence of some conceptual differences between the web market and the real market. Web based businesses are international by definition, since being established in a certain country or region they can still sell to any consumer willing to pay the price plus the cost of transport (in case of tangible goods). In case of software resellers or software e-commerce the international aspect of the company is more evident since the cost of transport is not directly applied to the good itself.

The inapplicability of the market analysis techniques to the web environment gives room for trying to develop a framework that would at least make us understand the way the web market behaves and determine in what manner competition between the web market and the real market takes place.

The sale volumes for the web market companies are constantly growing which in time could prove to be comparable to the real market. Therefore, in time the web market would provide competition to the real market businesses.

For now however it is unclear where competition between two e-commerce companies from different regions takes place. Also we have to determine what drives the consumers to choose one company over the other on the web, since it is not exactly a price driven market. As we are going to establish in this thesis, the web market is more driven by reputation, trust and awareness, towards a certain point and when the rest of the factors are the same then it is all brought down to price based competition.

Another interesting topic is why consumers migrate to buy from e-commerce and why they haven't done it before, since the price is mostly lower than that of the real market.

In the following chapters we are going to discuss the way the web market behaves, as well as some concepts why market analysis tools cannot be accurately applied to this market. We also are going to determine the segments of the web market and define the source of these segments' revenue.

The increase in user communication (forums, social networks) has given opportunity for the information not to be one-sided as it used to be. Since now users can interact with each other as well as with companies, it is more vital to deliver high quality goods with a good service attached to these. The information circulation is enabled both ways and the user communities can exchange experiences from buying certain goods as well as the usage and quality of these goods themselves. This gives incentive to a more pro-active market. Even though sometimes consumers might not be qualified to give quality feedback on the good it still has impact on the sales of the good itself, forcing the company to deliver high quality service attached to the goods. This service can include, guides as to how to use the good, the terms of the extended warranty, access to a certain platform of sales (example apple app store and android google play market).

In **Chapter 1**, as we mentioned before, we present the segment of the web market as well as the revenue source for the latter.

First before trying to separate the web based business market into different segments, we need to establish what we are going to define as web based business. Web based business can be defined as a type of business model which strongly relies on digital means and can't exist without the digital world, more precisely - the internet, at least not as the same business model.

Web based business sector is one of the developing markets at the moment. It has started to develop more intense since the appearance of Web 2.0 technology, which enables users to influence content filtering as well as content management, in some. (Tim O Reilly 2005)

The necessity for describing the market segments arose as a mean to show how different and large this market is. Although e-commerce is the most frequent segment to be referred to, it is but a part of the market. Limiting the research to just e-commerce activity will enable an accurate analysis to become nearly impossible. (Isla Gower 2008)

The first web based business segment we are going to mention is the gaming industry. This segment has 2 types of game publisher companies, specialized in: Browser Games and Online Multiplayer games.

Browser games are those games which do not require an installation to your computer and the gameplay itself is based in a browser window. These types of games



may vary by content from strategy games to gambling. Of course depending on the type we can see the way this or that type of game generates revenue.

Online multiplayer games are the ones that are required to be installed on your system in order to run. These can be purchased or with monthly subscriptions or both. The genres can be rather varied as well as the browser game types. To understand better this segment of web business we have to keep in mind that this industry relies mainly on providing a service and not just a product.

The game publishing segment generates revenue in a number of ways. The revenue generation may be via one-time purchase for online multiplayer games as well as for the browser games. This type of revenue generation is mainly based on the popularity of the game and on the number of customers who are willing to play. It is most frequent that these types of companies do not charge subscriptions to play the game itself, although they may use other methods of attracting additional funds from the customers.

The second popular method of generating profit for companies, for both browser and online multiplayer platform games, is to ask for donations in exchange for some small benefits in-game. This method is sometimes used with the one mentioned above, although it is not very frequent, as the imbalance created by such may upset and force customers to leave. An example of such method of generating profit could be [travian.com](http://travian.com). While card and casino type of games sometimes use this method as well, they tend to limit themselves to the gambling with real money, which means that the clients supplies his account with real money in order to play, thus the losses being also real. This type of revenue comes mainly from the concept of commission's fee for withdrawing money or even for the organization of the tournaments. A good example of a big card playing game website could be [PokerStars.com](http://PokerStars.com).

The third method to create income, for the gaming segment, could be the subscription fee used by some multiplayer online games. This fee is basically a monthly fee for the support service provided by the publisher's team of specialists, as well as for the use of the company's servers to play. This type of generating revenue is most suited for games which require a high amount of time to play as it maximizes the amount of clients willing to pay. A good example of such game could be *World of Warcraft*, published by Blizzard.

The second web based business segment is the Software Development sector. This sector has an interesting particularity, although it produces a good, this good mostly behaves like a service, usually with regular updates and tech support. It is also very difficult to determine the cost involved in obtaining the product, because the main component of the product is qualified labor force – programmers.

The revenues of this type of business are mainly coming from software sales, via digital purchase or the actual DVD purchase. Additional costs may come from subscriptions or the license extension, thus behaving more like a service than a product.

The software development sector has two important branches the customizable software development and the mainstream software development. The mainstream software development is when clients buy a finished product, which may or may not be adaptable, but is available to every client in almost the same package. While the customized software development companies are the type ones that create software to specifically meet your requirements and needs, which make it unique software per client.

Another sector, probably the most well known, is the one of e-commerce. These types of websites can either be retail or aimed to meet the requirements of B2B sector (Karthik N.S. Iyer, Richard Germain, Cindy Claycomb).

The e-commerce sector, is formed of the following 3 subcategories: Auction based E-commerce, Pure E-commerce (or stand alone e-commerce) and real shop duplicate. The software reseller type is not included in this category as it is a part of the software development network and not exactly e-commerce.

Auction based e-commerce is a type of e-commerce where the product goes to the higher bidder. This type of e-commerce is mainly driven by client to client transactions, and is based on used goods. A good example of such type of e-commerce is the eBay.com website. Ebay.com is a large website with renown and most of the products on ebay.com are user posted, thus being second hand products. Although eBay.com started selling new products as well, but the stereotype formed in user minds makes it not so popular in the field of new products, as people are used to buying used goods on ebay.com.

Pure or stand alone E-commerce is the type of company which does not have a real presence via a local store, or a store at all. This type of e-commerce has a specific characteristic that it can be considered international by default as its web presence is

already global but the sales can be carried out in any country via the fast mailing service, such as FedEx, UPS, American Express. E-commerce companies of this type have in common the fact that the entry barriers are rather low, as compared to the other types from the e-commerce sector. In this type of e-commerce it is quite hard to determine the geographical market as well as the market share and the market size, which makes it hard to analyze properly.

Real store duplicate type e-commerce is basically the easiest to define as it is the type of e-commerce which is just a supplement for web-presence of a real market shop. Thus the market geographical position is well known as it is the same with the market size. This type of e-commerce mainly has as clients the same customers the real shops have, which makes it easier to analyze. Although it is a store's presence on the web, it can also facilitate the company by accepting more payment methods than the real market store.

The revenues for e-commerce obviously come from selling products, but it's the type of payments which make it more flexible and feasible. There is a multitude of types of payments for the e-commerce sector, as the costs involved in the e-commerce maintenance are lower than those of the maintenance of a real store. These payments methods most frequently include: credit card payments, paypal.com payments and payment on receiver of the product. A lot of them also offer good credit terms to customers which can be made without it becoming a setback, because of the rather low costs involved. E-commerce websites can also earn profit via obtaining a sponsorship, which could even greater diminish their costs, or present a benefit.

The next sector which we are going to discuss is the Marketing data and database sales. These are the type of websites who sell statistics to large companies, to be used in their market analysis. These vendors could be: consulting agencies, search engines or even social network websites. Although the latter are stating that they use the user data just to create personalized ads in conformity with what the user likes.

The revenue of these companies is basically from traffic generation, which makes them attractive to place advertisement on. The more traffic a website generates the higher the price to post advertisement on that website.

We also have to mention how competition takes place between web market companies and a real market company.

As the web market started growing it was inevitable for the competition to occur with the real market. Although insignificant at first, due to its comparatively small size, now it can be considered a worthy competitor to the companies from the real market. Even though real market companies are also present on the web, their presence, in most cases, isn't as strong as their web market counterparts.

The competition generated by the web market is mainly between retailing companies. This is due to the fact that e-commerce is one of the most developed types of internet business at the moment.

When it comes to competition between the web market and the real market we should take into account the fact that e-commerce has an advantage, that it is international by definition. If we were to overlook this factor and just compare an e-commerce website to a local company, activating on the same market, we would find an interesting analysis which would also have to include the type of goods which are being sold.

As we mentioned earlier an e-commerce company has lower cost than a real market store, due to the lack of certain costs involved in the real market sector. Lower costs make web market companies be able to lower their prices as compared to the real market. (Michael R. Baye 2002)

While the e-commerce company might be having lower prices on the market, it still relies on one essential factor – trust. This factor is crucial in deciding whether to buy from the web or not. Some customers do not trust e-commerce website due to the delay between the payment date and the receive date of the product (most websites practice a pay then receive type of sales). Although this can be overcome by the support of payment on receive, by the e-commerce company, some customers are still reticent to pay for a product, which they cannot feel at that same moment they pay for it.

With trust being a real issue for e-commerce companies we can assume that digital retailers tend to attract consumers with lower prices than the real market. And as the trust level rises towards an e-commerce, the prices can get closer to the real market stores.

Companies that present themselves as the real market duplicates do not have to earn trust of the consumers, as they already have a brand name behind the e-commerce

website, which drives the consumers. If to take on a local market this type of companies might have an advantage against their pure e-commerce counterparts, although in some cases the trust of customers towards an e-commerce is so high that the absence of presence on the real market is not an issue. (Paul Shaw 2001)

For the B2B sector trust plays a crucial role in the decision making process. When companies search for a supplier and decide whether to include that company into its supply chain, the buying company wants to feel secure. This subject affects delivery terms, prices, stock availability etc.

Besides trust there are other factors that could influence the decision to buy online or go to a local store. These factors include such things as how prepared are the customers from the market to buy online. Although more and more customers every day are seeing online payments as being friendlier, a lot of them are still skeptical.

Other customers aren't willing to buy online due to the delivery terms, which might take up to 2 weeks, while if they buy from a local store they receive the good at the moment of the payment. This delay, even though it implies lower prices, sometimes, makes customers renounce on the web market stores.

The most sold products on the web being, electronics this is where the web market can create a more serious competition to the real market. The market of electronics is more flexible towards delivery dates, for the customer, because the sole decision of buying an electronic gadget requires time.

The electronics market is extremely price sensitive as the products that clients might be interested in, are already well known to them. This makes the websites or real market stores just places where customers buy the products which they already know and want to buy.

In terms on sale volumes, although e-commerce companies are growing fast, they do not present a serious threat at the moment for the real market companies. As a percentage of the total sales the amount of sales on the web market are relatively low in any country.

The competition between e-commerce companies revolves around the concept of price and the term of willingness of the customers to buy online. The real market stores gain a possible advantage by having shop assistants who can inform the customers about

the best products for their needs; it would seem that the web market couldn't keep up with all this, but it has. E-commerce websites nowadays can show you products which would be useful exactly for you. This is done by taking a short questionnaire, the answers do not have a technical aspect to them, and it basically has to do with expressing the features of your product with user-friendly terms.

While the e-commerce companies have a real competition with the real market, companies such as streaming media websites do not. There is no specific analogue to the streaming media companies from the web market sector on the real market. Thus we cannot accurately analyze its state of competition with the real market.

However the competition between two web companies is a little bit different.

The competition between web companies is not only price based, but also service based. This is due to the fact that on the web, the decision to buy from a certain website is not only related to the price, but also to the service that is incorporated in that price.

Web market has lower prices than the real market, due to lower costs, but among the companies from the web this difference doesn't create a serious advantage. Thus the competition on web companies is more oriented towards the quality of the service offered.

The differentiation between companies on the web market is based more on the service side of the company, rather than the prices of the products themselves. Thus the client will choose the company that provides a better service with the product. Such services might include things like: extended warranty, free delivery, faster delivery, customer service etc.

With this being said we have to think of another aspect. If a web company, let it be company A, is better known than company B, which in turn provides a better service, then we will notice customers still buying more from company A. This is the effect of awareness on the web market. The market being so large in terms of web addresses that we have companies of which customers are more aware. Because the web is based on awareness we can state that some companies remain unnoticed and never grow to have a large client base.

The awareness of a company's web presence can be done with the help of ads, which sometimes are accompanied by attractive offers. In order to increase awareness of

a website the ads have to be placed on frequently visited websites and on websites with more or less the same profile. I.E. if we place an ad of an e-commerce selling digital cameras on a website of photography, it would have more effect than if it were placed on a website that sells footwear.

After customers are aware of the website's existence and decide to buy online, they will buy from the website which they trust most. As we already mentioned trust plays an important role in the decision to buy from a certain website. The larger the trust towards a website the more customers would be willing to pay for their goods, of course not as much as they would be willing to pay on a real market store. If we are going to have two distinct web companies, that sell the same products, but one is more trusted, then the one with more trust can charge more for the same products/services.

Trust plays a crucial role not only in the web retail segment, but in other sectors as well. If a customer is deciding whether to get his ads posted on the web by an unknown company but cheap or get them posted by google.com but for a higher price, most customers will go for google.com. This effect is due to the trust that clients have in a brand name. Trust is important on the real market as well, but on the web where companies can offer only some images of the product or a description of a service and nothing more, it can be a difference between success and failure.

Presumably two web companies are trusted the same and have the same level of awareness on the web, then the sales volume will depend on reputation. Although reputation is connected to trust, it means something more. Reputation incorporates company's previous experiences be it good or bad. It is the way customers perceive a company.

If a company's reputation is good this means that the satisfaction of previous customers was high. This means that the potential customers might expect their satisfaction from using a company's service to be at the same level as the previous companies. I.E. we will take two companies which are trusted the same, but with different reputations on the international level. Let the first company be amazon.com and the second one be buy.com. Both companies are trusted that they will fulfill their part of the deal, but consumers tend to buy more from amazon.com as it has a reputation of leaving their customers satisfied.

The price competition on web is stronger in the last instance, that is if the companies have the same level of awareness, level of trust and more or less similar reputations, and then prices might influence consumers to buy from a company instead of another. To be easier understood the decision of buying online from one company or the other has the following form.

**Figure1: The hierarchy of web market factors for competition between two web companies**



*Source: Developed by the author*

In the Figure 1 we can see that first a customer has to be aware of a web company's presence, and then the customer has to trust the company, if the trust is equal then the reputation comes into play. If both companies are perceived the same by all previously stated factors then the consumers will be driven by the lowest price, thus maximizing the price/value ratio.

The factors presented in Figure 5 might apply to the web companies which have the same products or offer the same services. If the services are slightly difference as in the purchase of an antivirus software, then we will see that reputation and trust play an even greater role and the price is not exactly relevant as long as it stays in roughly the same price category.

In general for all web companies that offer services instead of products, trust and reputation play a much greater role than the price itself.

In **Chapter 2**, entitled "Economic theory analysis for the web and the inapplicability of such", we present classic market theories. After presenting them we give some theoretical aspects as to why these theories are inapplicable for the web market. After presenting the aforementioned market theories, we try to determine the role of reputation as well as how the latter affects a company's competitive position depending on the reputation of the country of origin.



As explained in some sources reputation presents a competitive advantage on the real market. This reputation can be associated with a brand or a specific retailer in some cases.

Even on the real market reputation can influence a consumer's willingness to buy from a specific retailer or to choose a specific brand. This is due to the fact that reputation incorporates the company's previous experiences. These in turn helps potential customers see the company as a trustworthy place to make their purchases.

Researchers often associate good reputation of a brand to the competitive advantage of its products. This in turn brings us to another conclusion that a bad reputation can pose a competitive disadvantage of the products, thus leading to the decline of the company's sales figure.

Michael E. Porter (1998) determines that we can speak of a global market, and the companies that operate on this market are grouped into clusters. This diminishes their costs and leads to a high quality and innovative product. In some way this can be thought of as being a kind of reputation of regions. I.E. people consider the Silicon Valley as being an innovative cluster, this is due to its reputation of doing so in the past periods.

David M. Kreps and Robert Wilson (1981) show that in a two stage game reputation plays a crucial role since sellers try to build up reputation in the first stage as to appear benevolent and this in turn brings to better sales in the second period.

Paolo Vanin (2007) stated that nowadays competition is hand in hand with reputation since the disregard for a company's promises might lead it out of the market. This is shown due to the fact that if buyers pay a higher price for high quality and area cheated, the company that cheated them, thus gaining bad reputation, will have a hard time making sales in the second term. This could lead for companies to intend to become trustworthy as by Klein and Leffler (1981). Paolo Vanin in his paper from 2007 does not use in his analysis such factors as brand image and advertisement in order to make the model easier to predict.

However reputation is not accepted by all economists as a factor that influences competition. One strong point that reputation is given by Matthias Sutter, Uwe Delleck and Rudolf Kerschbamer in their paper from 2009, where they studied a large experiment

of 936 participants for efficiency in credence goods markets. This research had as a conclusion that allowing sellers to build up reputation had little influence.

Although reputation can pose a competitive advantage its use in the analysis of companies on the real market is of limited value, due to the fact that Fortune ratings are made by the financial performance of the company. The financial performance of the company although it might rely to some extent on reputation it has more important factors incorporated. (David L. Deephouse 2000)

Reputation as a competitive advantage allows companies to be more flexible. This flexibility is expressed in terms of prices that can be thought of as sticky and thus they do not completely and immediately reflect the fluctuations in supply and demand. I.E. the reputation of a company or its products is high therefore customers will buy it even if the price is relatively high as compared to the other competitors that are led by the supply demand ratio.

From this example we can understand that the higher the reputation of a company or a company's products the more this company will be chosen by client in disregard to their possibly higher prices. Therefore the reputation can be thought of as being a factor that can allow a company to receive higher mark-ups without decreasing their sales.

Reputation can be thought of a company's asset, and as any other asset it has specific particularities. The main particularities of reputation consist of the fact that reputation is harder to earn than to lose.

In order to create a good brand reputation it takes a series of successful promotions, events and satisfied customers. The post sales service can help the company build up their reputation, thus encouraging more customers to make their purchases from a certain company or a certain company's products.

Although it is hard to build up a good brand reputation and recognition, it is rather easy to obtain bad reputation for the company, because all it takes to spoil a company's reputation is a couple of bad practices. Due to this fact companies are more inclined to research and develop around practices that were successful in the past, without trying anything conceptually new.

Thus, though, reputation can pose a competitive advantage, but at the same time it encourages companies to come back to practices that proved efficient in the past, with

just some improvements on the latter. This fact can explain why, the majority of the products even though they pose the same level of reputation there are still not many companies willing to innovate conceptually.

The main market theories do not give reputation enough value in the market analysis, this being due to its limited role in the financial indicators of the companies. Although, nowadays, reputation started being researched at a higher scale as a competitive advantage factor, it is still not too common to come by, in the analysis.

Now that we have presented the major market theories out there on the market we can now start to draft out our theory, which would apply to the web market. This theory will contain of some basic ideas of market behavior for this specific market.

Although the web market is a relatively new market, it has some characteristics which do not differ greatly from the classic markets, thus making some of the concepts from the neoclassic theories apply to this one as well.

The web market has specific segments, some of which do not have counterparts on the real market. This and another number of particularities makes the web a more specific market to analyze with the classic market theories.

As we enumerated previously the Smithian market theory cannot be applied to this sector due to some of the reasons stated before. These reasons number elements such as goods exchange values and unfortunately even the “invisible hand” principle cannot fully apply to the web market. Although the web market has the possibility to auto regulate and to come to the normal prices, but since the prices on the web market tend to be sticky it sometimes takes time. The governmental regulation is again not a very attractive option, if it were to be implemented on a country level.

As a market theory we could combine some of the aspects of the classic and neoclassic theories to make them more feasible for the web market. Thus we are to define some basic concepts of the market and how we could define them in terms of the existent theories.

Firstly the web market doesn't differ in terms of the market regulation as in market freedom. The web market is known for its freedom as compared to the real market, where some regulations may apply without favoring some companies over others, but as the

web market companies compete on a global level, thus the local regulations could generate some benefits of detriments.

The market has a possibility to auto regulate to a normal state, though it has to be regulated in terms of mergers. The market auto regulation is possible due to the active competition and the rivalry for a larger market share. While the market can auto regulate and it might not seem necessary to be regulated in terms of antitrust policies, it isn't so. For the real market when the institutions analyze mergers they view their financial data as well as market shares, to determine whether the merger could be malefic for the market. In terms of the web market while the merger might not seem to distort the competition in any obvious way by financial figures, it might do it by potential. So on the web when a merger was to be analyzed not only financial figures should be researched, but the amount of visitors as well, because if a website has a large number of visitors or users, but doesn't profit from the fact it because they do not have means and in the case such a website would be overtaken by an advertisement agency, it would surely give them an advantage against their competition.

So the absence of regulation of the web market should indicate that the institutions that analyze mergers and other antitrust cases they should also take into account the amount of users than merger has gained, not only market share, which doesn't necessary mean the same thing. I.E. youtube.com has a high number of users, but not whole of its users create its market share, as it generates revenue by advertisement.

The second aspect which we should cover would be the entry barriers, as apparently there are few to enter the market. Although in order to be competitive you should make your potential consumers be aware of the fact that you are present on the market. After awareness there are a number of other steps in order to be competitive. These steps were described in the previous chapter. The steps progress as follows first the potential consumers have to be aware of the company's presence on the market, then they have to trust the company and then the reputation starts playing a crucial role and only after all of these steps are achieved price becomes an important factor.

The amount of companies on the web market is large, while the market cannot be exactly called a perfect competition, as the market shares of these companies differ

greatly. There are a number of extremely large companies that own a lot of websites, via mergers that hold the majority. (I.E. google, amazon etc.)

A very important characteristic of the web market is that the companies try to gain a competitive advantage through advertisement which is most frequently used to make the potential customers aware of the services that come post-purchase. Therefore the market itself relies a lot on the post-sale services, as well as different delivery terms, customer support services etc. Being a service based market means that customers would choose one web company over the other according to the services that these companies provide.

The service aspect of any good bought from the web leads us to the idea of the advertisement that is done by the means of online ads, as well as mouth to mouth transmission. This can be attributed to good reputation, as positive reputation reflects the opinion of the customers' about the service or the truthfulness of the statement that the company provided, be it after purchase or prior to one. I.E. if a customer buys from a company that states that the goods will be delivered free of charge at a certain date and fulfills this promise, then the customer would be more tended to praise the company to his friends, and even post positive feedback on the website itself that might determine other potential customers to buy precisely from that website.

The types of consumers that buy from the web market could be categorized as having bounded rationality. Their rationality is bounded by the fact that they do not see the whole market and make their decision based on the image a certain web company has created. I.E. one of the most used and well known e-commerce websites is amazon.com, this is due to the fact that it has a large number of satisfied customers.

A completely rational consumer would rather go for the lowest possible price for a certain good. While on the web market we can see that clients prefer to pay more but on a website with a good reputation and on the one they trust. So in this the web market tends to follow the market theories of the Harvard School of Economic thought that states that consumers have bounded rationality. This can be due to their preferences or to the insufficient information on the market.

Now we can speak more in depth about the reputation factor and its potential impact on the supply and demand effect on price setting. Due to the fact that web market

consumers make a decision to buy from the web judging by the fact that they either trust the market or they don't, we can say that trust and reputation can have an impact on the decision to buy.

A good reputation of a certain web market company can influence consumers to use their services or buy their products even if the price set by them isn't necessarily the lowest from the market. Thus if demand drops the ones that will be forced to lower their prices are the companies with lower reputation or trust. On the other hand the companies that have a high reputation will still have their sales volume at the same level. Although we have to mention that if the demand drops drastically on the most important market for the web company then even the companies with a high reputation would have to lower their prices. Another important aspect is that if the demand is to drop on the market that is of secondary importance to the web company, then the company won't have to decrease their prices.

The demand drops on the web market may not affect directly their prices, but if the demand drops on the real market, and real market companies lower their prices, then the web market in turn would have to lower them as well. This is due to the fact that the web market companies gain their competitive advantage from the fact that they have lower prices than the real market and sometimes better service. However if the web market would have the same prices as the real market it might lose sales, because it wouldn't seem as attractive to customers.

Another important aspect of reputation is that when a web company is viewed from another market than that of its origin, then the reputation of its country of origin is very important as it might set a competitive advantage on that market. Let us have a company A, which is situated in country A<sup>1</sup>, then the reputation scheme, can be viewed in the following table.

**Table 1: Country Reputation against Company reputation, competitive advantage analysis**

		Reputation of Company A in Country A <sup>1</sup>	
		High	Low
Reputation of Country A <sup>1</sup>	High	A high competitive advantage	No Competitive Advantage
	Low	No Competitive Advantage	A competitive Disadvantage

*Source: Developed by the author*

As we can see from table 1, the competitive advantage is seen even if the company A is being viewed from another market than that of its origin country. A reputation of a country however means that it is regarded as being good in the field that the company A operates.

When the company has a high reputation on a market that is considered unqualified or regarded poorly in the field of the company, then this reputation is annulled by the fact that the country doesn't instill power in the field. I.E. if a company sells shoes and is from a country that is not highly regarded for shoe sales, then it will be regarded as a poor company on another market, and won't be chosen in favor of more powerful competitors. The same situation would arise in the case that if a company has a low reputation on a qualified market.

While if we are to analyze the impact of reputation on the competitive advantage of a company on another market, if the market has low reputation as well as the company from that country, then the company would be faced with a competitive disadvantage.

In conclusion we could say that the web market is a market characterized by bounded rationality from the customers, it has low entry barriers, it can be thought of as being global and at the same time this type of market is highly dependent on reputation.

In **Chapter 3**, we cover aspects related to market power as well as the notion of relevant market. We also cover the way relevant market is defined by the antitrust authorities and researchers.

An important tool, presented in this chapter, which is frequently used by the antitrust authorities is the SSNIP analysis. This analysis is used primarily to establish the dominant position of a company on the market, but one of the steps which it goes through in order to complete the analysis is the definition of the relevant market.

The relevant market presents the market that need to be analyzed in order to get accurate results about the way companies participate in competition. Meaning that competition and substitute goods are analyzed only in a certain geographic area, this being sufficient in order to come to a conclusion as to whether the case poses a threat to market competition or not.

The SSNIP test is frequently used by analysts in order to determine the relevant market and to proceed with the analysis of market competition as a whole. The market power of a company is determined by this test, if to oversimplify, using the method of increasing the price by 5% and if the company would not lose its market share then the company is considered to have a high market power. This could prove detrimental to the competitive environment and moreover consumers, since the company could keep increasing the price without having to fear loss of clients. However this test also takes into account the substitutes for the analyzed good or service, present on the relevant market. Since the Antitrust Regulation Authorities couldn't dictate companies to increase their price by 5% in order to check whether this would determine consumers to migrate to other companies, this is why they have to rely on the data already available from the past of the company and the results which this increase in price had on the market at that period.

Another tool discussed in this chapter is the cross elasticity of demand. To determine the cross elasticity of demand we need to look into if certain products are on the same market as the analyzed ones. The cross elasticity measures the percentage change in the demand for good A as a response to the change in price for good B. In case the cross elasticity is positive then we can see that the analyzed goods are substitutes, thus these products form a single relevant market. However if the cross elasticity is negative then the goods are complementary.

This chapter also includes merger analysis, since these formations may potentially distort competition on a market and be used by companies to gain more market power.



However sometimes mergers are beneficial to the consumers since these can bring high quality products to the market and develop new products as a whole.

The effects of a merger can be analyzed by the price-concentration analysis which is based on the relationship between price and concentration and supplies valuable data concerning possible effects of a merger. If higher price is associated with higher concentration levels, this will lead us to the conclusion that the concentration operation would lead to higher prices.

The price-concentration analysis can be utilized when facing dominant position. If there is no relationship of the form price-concentration on a market, this means that even high market shares do not grant market power to the companies.

Another tools for market power estimation is the simulation analysis, which is based on describing the behavior of consumers and producers. Based on the observation results regarding price and sales, the elasticity of price and the intensity of competition will be estimated. Through simulation analysis we can estimate and study market power or the changes it may lead to after a merger between two companies.

In **Chapter 4**, entitled “Market models and Market analysis Tools”, we present the market models such as Bertrand and Cournot competition, though these are not the only market models used, these two being the two extremes of price-setting competition and quantity-setting competition, provide useful analysis tools.

This chapter has the role of presenting the reader with models which are used for modeling the market. The Ordinary Least Square method is also presented in this chapter, as well as some theoretical concepts as to why it cannot be applied accurately for the web market.

**Chapter 5**, entitled “Web market models and a 5 stage reputation-awareness game for modeling the web market”, is used to illustrate the web market models developed by researchers as well as some classifications of such.

In this chapter we also present the cluster theory presented by M. Porter. This theory is based on the premise that if a certain cluster has a good reputation than all of the companies that are from that cluster benefit from the reputation of this cluster. This helps enforce the idea presented in chapter 2 about reputation of a country and reputation of a company in that country.

However the main contribution of this chapter is the adaptation of Vanin 2007, reputation model so that it can be applicable for competition between web companies. This is done by integrating the awareness coefficient.

### **Awareness and Reputation Game**

Here we try to develop our own 5 stage game by making modifications to the model of reputation presented by Vanin 2007. Some elements of the 5 stage game, which we will be presenting are the same as the ones present in the Vanin model, so therefore we will skip them, presenting only the most important part in this research.

The game consists, as mentioned above, of 5 stages. These stages are derived from the ones presented in Vanin 2007 model, with some modifications. Therefore some of the implications are derived from there as well.

In **stage 1** the companies have to determine which level of awareness they are going to adopt, it can vary from 0 to 1 ( $0 \leq a \leq 1$ ) and imply a cost of  $c > 0$  which will be incorporated in the cost to enter the market by the companies.

This stage is important due to the fact that the potential market share gain can be derived from the  $a$  coefficient. Though reputation is important in determining the revenue in later stages of the game, it is not as important as awareness due to the fact that this coefficient models the part of the market the companies have access to.

During **stage 2** companies determine whether they wish to enter the market or not. However if they do wish to enter the market they must pay a cost of  $c > 0$ . In our case, the costs from stage 1 and stage 2 sum up as to make up as a whole.

This stage takes place at the same time as stage 1. This is due to the fact that companies do not need to adopt a certain level of awareness if they do not wish to enter the market whatsoever.

In **stage 3** companies determine whether they want to produce high or low quality goods, this can be expressed by the function  $z_j \in \{0,1\}^n$ , where 0 means low quality and 1 means high quality. For simplicity we are to assume, just like Vanin 2007, that consumers do not know about the quality of the goods. The quality of the goods will not be changed in the following two stages.

**Stage 4.** This is the first stage where there is the first market interaction. This stage begins with the companies setting their price levels at  $p_1$  and as a response consumers set

their demand function at  $q_1$ . However, at this stage of market interaction consumers do not yet possess the information what quality do companies produce.

**Stage 5.** This stage is the same as the previous stage only consumers know the quality companies produce, provided they have consumed a High quality product in the previous stage. If they have consumed a low quality product in the previous stage then they have no information about the company's products whatsoever.

The company's demand function is expressed by Vanin in his model by the following expression:

$$q_j(p, e, n) = \frac{1}{n} \left\{ \left[ \frac{n + \mu(n-1)}{n} \right] [\alpha(e_j) - p_j] - \frac{\mu}{n} \sum_{i \neq j} [\alpha(e_k) - p_k] \right\}.$$

In our case, if we were to assume that each company's demand function is also a solvable demand, then the potential profits of the company could be expressed by the following expression:

$$Profit_{potential} = a \times q_j(p, e, n) - c_j,$$

Where  $c_j$  represents the costs supported by the company at stage 1 and at stage 2,  $a$  represents the level of awareness gained by the company at stage 1 and  $q_j(p, e, n)$  represents the demand function for company's products.

At stage 4 we will see that the competition between companies in this instance will be brought down to a Bertrand price based competition model. Which means that companies with the same level of awareness will have to undercut each other until they come down to the equality  $c_m = p$ . This will make companies with a higher level of awareness able to increase their prices due to the fact that the potential market for companies with lower awareness is smaller due to the size of the coefficient  $a$ . Therefore the companies with larger awareness levels can increase their price as compared to the ones with lower awareness levels and still gain profit from the remaining part of the market (  $market_{higher\ reputation\ companies} - market_{lower\ reputation\ companies}$  ). In turn companies with the most awareness will gain access to all of the market and be entitled to the position of setting the higher price on the market.

At stage 5 besides awareness, reputation would come in play, which is expressed in this model by the consumer beliefs about the quality of the good produced by the company. Therefore companies that have set their quality to 1 (high) will have higher payoffs than companies that have set their quality to 0 (low), which comes off as natural.

This game is good for presenting the role of awareness in company price-setting policy as well as to illustrate its importance on competition and market access, since the web is an information driven market.

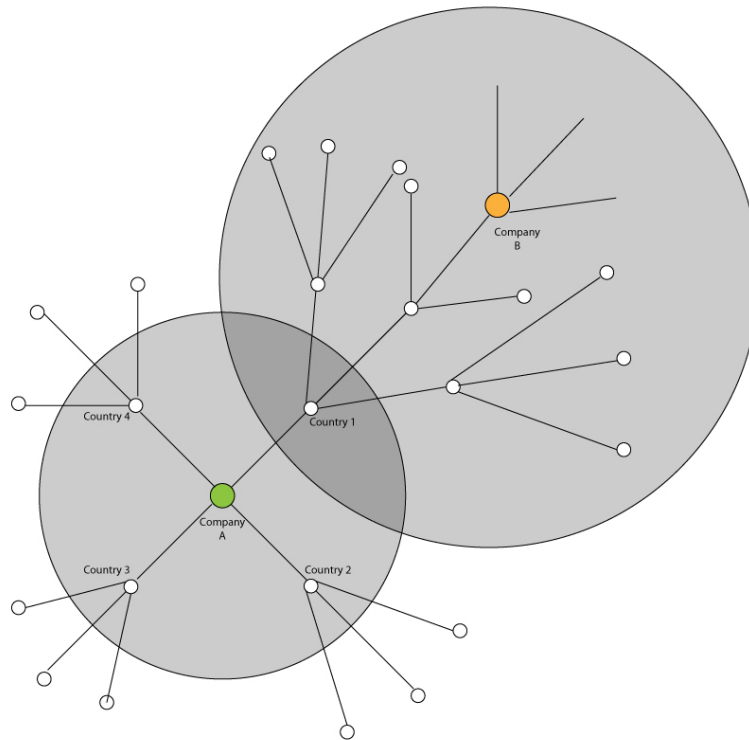
The **6<sup>th</sup> Chapter** introduces the reader to the concepts related to the economics of networks, as well as how competition is treated by these. We also present the concept of network goods, since we cannot mention networks without mentioning network goods and their properties.

This is all presented in order to give the user an insight, necessary for understanding the model which helps determine the market of competitive collusion between companies.

The theoretical model which is about to be presented if it were to be classified by the previous criteria, presented by Giaglis and Peteli 2003, it would most likely, at this stage of the research, fall under the category of “Understanding” business models.

In order to define the web market and its margins we have to keep in mind that a web business operates globally, therefore it has no boundaries and can be accessed from any country or region. Thus one of the ideas to define the web market geographic area of influence is to view it as a network, in which web companies are viewed as hubs. The other network nodes with which those hubs are linked could represent countries. As a result we would get something like the graph in the figure 2.

**Figure 2 Competition on the web Market**



Source: Developed by the author

In the graph presented in figure 2 we denote  $n$  as the number of countries and  $n_A$  as the number of countries on the company A's market and  $n_B$  on the company B's market accordingly. To define the size of the market A we could use the following method *Price for a good in a country*  $\geq p_a + a \times c_d$ , where  $a$  represents the number of connections between a hub and a country (distance),  $c_d$  cost of delivery to that country (in order for this to make sense we are to assume that all of the delivery costs for a link's length is the same value) and  $p_a$  represents price of a good in country  $a$ .

The size of the markets can be calculated as a sum of the countries' markets that are incorporated in this. But since the web market is a global market then we are going to have a primary sales market (which is located in a single country, in our case the Hub country itself), which generates let assume over a half of the company's revenue and secondary markets that compose the rest. Then the decrease in the demand curve would influence the price setting by company A only if the demand curve fluctuation would be in the primary market and not the secondary one, as the majority of the company's revenue comes from the primary market.

While to treat competitive collusion, between companies A and B, assuming that these companies are from completely different regions, we would have to look for the darker grey area in figure 2, which basically represents the area where the company A sells its goods as well as company B.

However in order for this model to function define the collusion market properly we need to introduce the term of e-commerce rank of influence. This rank of influence is what we further are going to call the distance at which the price set by the e-commerce company can sell their goods and still be under the real market price of that market. Therefore the e-commerce rank for this model will be predefined for simplicity sake.

The distance between two e-commerce markets will be defined by the nodes which are between them, the nodes themselves will represent rank of countries. Rank of countries however will be determined by their proximity to the source country of the e-commerce, ascending. The effect of price discrimination, while present on the real market, will not be taken into account in this model. This is due to the fact that while being present on the web market it is unclear of why it is happening precisely. The causes could be multiple, one of which could be the fact, that companies include the transport cost for their goods already in the final price on the local market. I.E. amazon has more e-commerce website addresses, these vary by the country you are in. Some examples of such would be amazon.co.uk, amazon.de and at last but not least amazon.com. While the prices differ on amazon.co.uk from amazon.com this could be due to the fact that amazon.co.uk already incorporates the transport cost of the goods to the UK, therefore forcing the company to practice a higher price level which would be the composite of the main price and the aforementioned cost of transfer.

This being said, we cannot be sure whether the price differs in order to either undercut by a small margin the prices of other e-commerce websites of that region or to include delivery cost into the final price. The taxes and duties could also play a vital role in setting the price at a higher level for a certain country. This uncertainty determines us in our web market model to assume that the difference in price is due to the delivery costs alone and therefore be ignored, since we already incorporated delivery costs in calculating the e-commerce rank.

We are going to see multiple scenarios of e-commerce collusion and the way it could be illustrate by networks. The first case which we are to present is the case of a two company e-commerce competition collusion.

### **Two Company Market collusion**

For this case we are to assume two e-commerce companies, let denote one of them A and the other B. We are to assume that on this web market these is no price discrimination, therefore the price of the company A is given only by its prices plus the delivery cost, the same method will be applied to company B.

Let the distance between these companies be n nodes, each node representing a country. And the delivery costs be denoted as  $C = c_1, c_2, c_3 \dots c_n$ , the prices of companies on markets denoted by nodes will be  $P = p_1, p_2, p_3 \dots p_n$ . The prices practiced by the companies themselves will be denoted by  $P_A$  and  $P_B$  respectively.  $K_{ij}$  will denote whether the company would still be profitable on that market or not and will take the form of:

$$K_{ij}^A = \begin{cases} 1, & \text{when } P_A + C \leq P \\ 0, & \text{when } P_A + C > P \end{cases}$$

For company B the company influence rank would be:

$$K_{ij}^B = \begin{cases} 1, & \text{when } P_B + C \leq P \\ 0, & \text{when } P_B + C > P \end{cases}.$$

Further we are going to check whether  $K_{ij}^A$  is met and for the number of C that cannot fulfill the profitability we will call it a rank of influence for company A. The same rules will be applied to company B.

We have to note that if the cost C is to be 1 for each node than we can just multiply it by the number of nodes to see the distance of e-commerce influence and this distance will depend solely on the prices P and the price set by the e-commerce itself.

For this we will have the following expression:

$$K_{ij}^A = \begin{cases} 1, & \text{when } P_A + n \leq P \\ 0, & \text{when } P_A + n > P \end{cases}$$

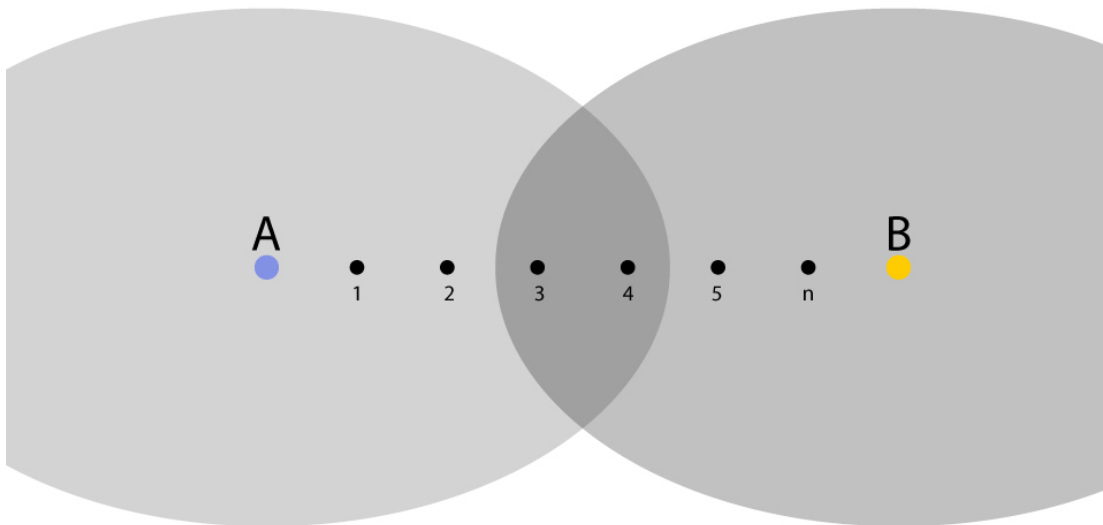
And for the company B it will look the following

$$K_{ij}^B = \begin{cases} 1, & \text{when } P_B + n \leq P \\ 0, & \text{when } P_B + n > P \end{cases}.$$

In order to get to a more concrete case we are going to assume the influence of company A as being  $\frac{n}{2} + 1$  and for the company B the same. Then we will have 2 ranks of countries (nodes) that will have competitive collusion between the two e-commerce companies.

The graph for this collusion can be seen in the following figure:

**Figure 3 Competitive collusion for Companies A and B in case of  $\frac{n}{2} + 1$  rank for each of the companies (Company A prespective)**



*Source: Developed by the author*

From this figure we can see that the competitive collusion will take place in rank 3 and 4 countries from A's perspective. However if the requirement  $K_{ij}^A$  equals zero from the beginning then we are talking about a small e-commerce that cannot be profitable outside of its country of origin and competitive collusion will take place only in case that their country will be in the influence of another e-commerce.

Presuming that each rank of countries has its own local e-commerce that has an influence rank of 1 and therefore is limited to only its local market, then the competition between the larger e-commerce and the local one will be brought down to the Awareness Trust Reputation and price model.

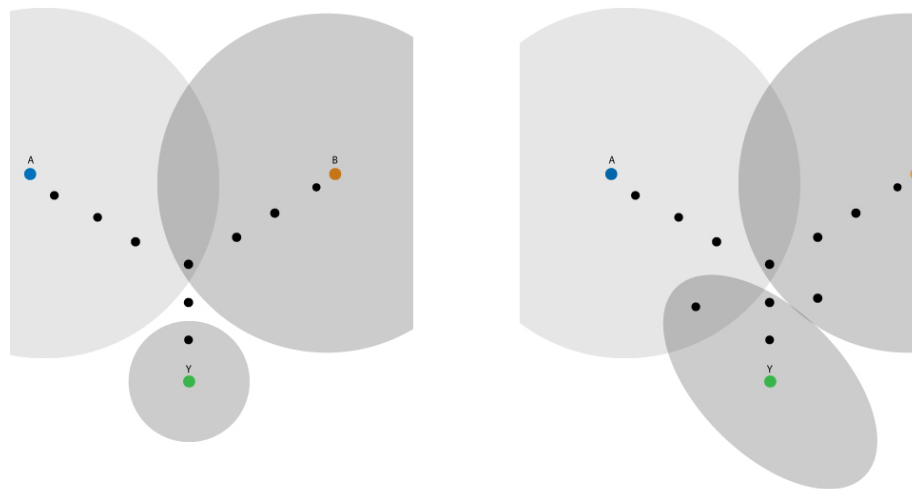
### **Three Company Market collusion**

Denote companies A and B discussed before and add company Y. For these companies the e-commerce influence rank determination process will be the same as it



was in the previous case. What will be different is that in this case we could have collision between two companies and not have collusion with the third. I.E. we can have a collusion between A and Y and not have collusion with B. Or we could have a case when companies have a collusion of different strength. Assuming that we have a collusion between companies A and B, of two ranks of countries, and only have collusion of 1 rank of these companies with company Y.

**Figure 4 Three company collusion irregular cases**



*Source: Developed by the author*

We can see that in these two cases the collusions are different since we have more variables included in the model such as  $P_Y$  and  $K_{ij}^Y$ , which makes it hard to predict. However in a perfect case when the cost is  $c=1$  (for each node) then we are more likely to see a collusion market for all of the three e-commerce at the same time.

However even though we have collusion and sometimes can determine it accurately we could not predict the behavior of companies in such a case, since the market where companies have competitive collusion might be an insignificant market for either of them (or both) and not influence the A, B and Y e-commerce prices whatsoever.

In conclusion to this model we can say that the web market is a distinct market that has to be treated separately, as of at the moment it doesn't have a clear market definition method and therefore cannot be accurately analyzed by classic market analysis methods.

We can state that the web market is a complex sector which consists of many segments. This market isn't driven by price based competition, as we stated before, it is

more of an awareness, trust, reputation driven competition, if we are to speak about the web market companies' competitive collusion, while it is still price driven if we analyze the web market versus the real market competition.

Another conclusion that we reach is the one that reputation poses a competitive advantage and as we can speak of a web business as being international by definition we can see the effects of a country's reputation as well as that of the company on the country's market. This in turn can help us better understand why some foreign web companies are preferred over the other ones, by customers.

The economics of networks models and theory is the best to describe the competitive collusion on the web market as it is very important, whether a company has a link to a market in order to consider this market as being a potential market for the company.

Though this model provides a useful insight into the way competitive collusion takes place between two web companies from different poles, it is rather hard to be accurately applied due to the lack of awareness in this model. The awareness mentioned before is not the awareness of a web company but the awareness of the majority of consumers that it is a possibility to order online from an e-commerce other than that of your country.