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Applying HACCP in the Tunisian Olive Oil Industry: A Theoretical Background

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Abstract

Olive oil has proven nutritional value and can command a high market price for farmers and processors. It promises significant income generating potential as well as social empowerment. To meet consumers' expectations for quality, safety and authenticity, olive oil products should be grown, harvested and processed according to internationally recognized food safety management standards. Instead of retrospectively inspecting and testing the end-product, a preventative approach that anticipates potential biological, chemical and physical hazards at all stages of the value chain should be incorporated to preserve the quality and ensure the safety of olive oil and olive fruits. In this research paper, we overlay a HACCP food safety management system on the olive oil value chain in Tunisia. Given the importance of Tunisia in the international market of olive oil, we discuss HACCP in context of the country specificities and we analyze the possibilities and challenges of implementing HACCP in the Tunisian olive oil industry. HACCP promises several advantages including the preservation of product quality and safety for human consumption. Moreover, HACCP can aid Tunisian export sales, improve customers satisfaction and enhance Tunisian branding and marketing. However, this food safety management system requires the commitment of significant resources and the engagement of all stakeholders in the plan.

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1. Introduction

Olive tree cultivation is an ancient practice which dates back to 2500 BC according to Boskou (2006). Presently, olive oil is traded as a very valuable commodity in the global agri-food industry. Scholars have researched its nutritional value and utility to benefit human health and well being (Martín-Peláez et al., 2013)

Moreover, its high price presents an attractive income generating potential for farmers and processors and enables social empowerment. Consumers around the world are increasingly preferring olive oil or extra virgin olive oil for its nutritional and sensory properties including taste and aroma (Bosque-Sendra et al., 2011). In parallel with the increasing demand for high-quality products and the tendency to seek safe and authentic foods, olive oil producers must adopt internationally recognized food safety management systems to meet customers expectations. Moreover, food safety regulations is a key driver for olive oil producers to apply food safety management programs that encompass the entire olive oil value chain, rather than covering a specific process in the olive oil production. Instead of inspecting and testing the end-product, an approach that anticipates and prevents any potential hazards or physical damage should be incorporated to preserve the quality of olive oil products from the beginning of the process to the end of the marketing chain, meaning, from the farm to the table (Harris et al., 1995). In this context, Hazard Analysis Critical Control Points (HACCP) is a internationally recognized systematic approach which focuses on risk management and prevention to ensure food safety and conformity with quality standards (Tian, 2017). The application of a HACCP program allows for monitoring and preventative control of potential hazards (i.e., biological, chemical or physical) that could compromise the quality of olive oil and jeopardize consumers' health and safety.

The study of a HACCP management system is important in the Tunisian context because the olive oil industry plays an important role in spurring economic growth but lacks a research focus. Tunisia is one of the world's top olive oil producing countries embraces the growing global demand for olive oil (Karray, 2006). Olive tree cultivation in Tunisia dates back to the 8th century BC and before the founding of Carthage (Larbi & Chymes, 2010). The Romans furthered the expansion of olive cultivation in the country by increasing irrigation and developing techniques for oil extraction. In modern times, the olive oil sector plays an important role in the social and economic life of Tunisia by providing both employment and export revenue. In volume terms, Tunisia is ranked the world's third largest producer of olive oil with 279,000 tons in 2013 (Zaied & Zouabi, 2016). The production of olive oil is mainly export-oriented, ranking Tunisia second after the European Union in olive oil exports. The quantity exported represents 70% of the total production and approximately 16% of the global exports (Larbi & Chymes, 2010). Several qualities of olive oil are destined for export and almost exclusively virgin olive oil. The main traditional importers are the European countries which receive olive oil in bulk and at low commodity prices with approximately 60% of the total exported quantity to Italy, 20% to Spain and 11.4% to the USA.

The economic policies and the structural and institutional reforms undertaken by the agricultural sector in Tunisia have helped to promote the modernization and the adoption of technology in the agricultural growing activities (Larbi & Chymes, 2010). Besides, several incentives are undertaken to promote the production and marketing of olive oil that is produced in Tunisia with a Tunisian brand and destined for export. Indeed, despite all of these incentives, the olive oil industry exhibits weak efforts for quality preservation and product valorization (conditioning, geographical indication, and appellation of origin etc.) (Karray, 2014). Similarly, the intensification of olive cultivation along with the shift to irrigation directs the attention of industrialists and producers to place more importance on the quantity of ground olives rather than on the quality of the extracted olive oil itself.

Along the entire olive value chain, many factors influence the quality of olive oil. For instance, orchard cultivation practices such as the selection of olive grove variety, pruning, fertilization and plant health treatment are essential for the full development of the agronomic characteristics of the tree that determines the quality of the extracted olive oil (Boskou, 2000). Likewise, the harvesting methods (i.e., traditional or mechanical) and pre-extraction storage are the most critical stages in determining the oil quality (Rabiei, Ghorbani, & Hajnajari, 2011; Kiritsakis et al., 1998; Vossen, 2009). The downstream supply chain activities involving packaging and retailing including retail shelf storage can results in quality deterioration if not properly managed. Therefore, mitigating contaminations risks and hazards should be a key priority for Tunisian olive oil producers. To achieve this, the present study proposes a theoretical and practical framework for application of a HACCP management system that addresses the potential risks and hazards pertaining to the olive oil value chain. Previous studies on the subject limit the application of HACCP to risks and hazards encountered in the extraction processes (El-Kalyoubi, Abd El-Razik, & Abou-Zaid, 2013) , with a lack of research in other equally important stages of the olive oil value chain. Thus, this identified gap in the literature is what this work is intended to fill.

In addition, there is a lack of research dealing with the possibilities of a HACCP system specifically for Tunisian olive oil producers. Even though the 'National Program of Promotion of the Quality' enabled support to companies in the implementation of quality management systems (Meybeck & Redfern, 2014), these initiatives remains underutilized for many reasons. Nevertheless, with the revised government orientation towards protecting consumers and increasing exports of Tunisian branded olive oil, the adoption of the HACCP management system will provide positive benefits to Tunisia. For example, compliance to HACCP not only provides an internationally recognized global certification, it also helps to assure product quality and safety as well as competitive access to international markets.

Hence, the remainder of the paper is divided as follows. Section 2 introduces the olive oil sector in Tunisia in detail. Section 3 presents the HACCP system along with the different hazards and risks that might be encountered throughout the entire olive oil value chain. Section 4 discusses the possibilities and challenges of implementing such a system for Tunisian olive oil producers. The last section covers a brief conclusion for the paper.

2. The Olive Oil Sector in Tunisia

The olive oil sector is well established in Tunisia. It covers 1.7 million hectares or 30% of the total arable land and about 19% of the world olive orchards and 8.44 % of the world olive oil in 2017/2018 crop year (Radinovsky, 2019). Several varieties of olives are spreading throughout the country and their geographical breakdown indicates that the crop extends from the northern region to the southern region where two-thirds of the total olive growing area is in arid or semi-arid conditions (Abdelhamid et al., 2013). The olive production in Tunisia is based on two main cultivars: "Chetoui" in the north and "Chemlali" in the center and south of the country. Furthermore, olive oil processing is composed of three extraction systems that coexist: the *continuous* system, which is the most widespread, the *super-press* and the *traditional* method (i.e., classic). Equally, the extraction industry involves more than 1,700 mills in which traditional triturating units are more numerous than continuous (Issaoui et al., 2015). They are broken down as follows: 628 classic units, 388 Super-Press and 718 continuous chains (Angulo et al., 2011). Some olive extraction units combine different types of processing units and are referred to as mixed units. Additionally, Tunisia has a spatial concentration of 40 industrial units for olive oil packaging, 15 refineries, 14 units pomace oil extraction and more than 100 exporters (Abdelhamid et al., 2013). Combined, these resources offer great potential for capacity building to reinforce and grow the sector. With this as context, a strategic option for the Tunisian government is to increase the number of continuous olive mill units.

The labor force is estimated to exceed one million workers comprising mainly of seasonal workers directly recruited during the harvesting process and 269,000 regular farmers dedicated to the growing of olives (Angulo et al., 2011). The mechanical harvesting is in its infancy stage and only 9.1% of farmers use canopy or self-propelled vibratory shakers (Issaoui et al., 2015). Olives are harvested at the point of ripening; meaning that they reach their maturity state or the green-yellow or black-purple stage (Boskou, 2000) and the oil accumulation in the olive fruit (or drupe) is maximized and suitable for harvest (García & Yousfi,

2006). Ninety-eight percent of the olive oil extracted from the olive drupes is supplied to countries in bulk at a reduced or zero customs duties. The large European bottling and refining companies blend the Tunisian virgin olive oil with oils from other regions, then bottle and market it using their private brands and labels. Some private Tunisian firms bottle and brand for the export market although the volume is approx. 2% of the total exports (Mtimet et al., 2013). Unlike the other traditional producing countries, the consumption of olive oil per person in Tunisia is very low (approximately 4 kg/ capita/ year) (Angulo et al., 2011). Tunisian consumers often buy olive oil in bulk directly from the producers. Domestic consumption of bottled olive oil is mainly driven by consumers in cities such as the capital Tunis where consumer trends include one-stop shopping in modern retail (supermarkets).

In order to boost the olive oil industry, Tunisia has undertaken a series of economic and institutional reforms (Larbi & Chymes, 2010). Measures have been taken by the Tunisian government to ensure stable production and to mitigate harvest quantity fluctuations by encouraging the use of irrigation (intensive or hyper-intensive growing) and increasing the proportion of irrigated olive orchards (2%) (Angulo et al., 2011). Facing increased international market competition, the government has taken several measures to support and reinforce the industry by promoting the consumption and export of bottled and branded olive oil (versus commodity priced bulk). The encouragement of exports has been the task of various funds created recently such as FOPRODEX, FOPROHOC and FAMEX that made a substantial contribution in enhancing export performance. Regardless of these facts, the many mentoring programs (e.g., good cultural practices and guidance), training, promotion, and institutional support have not significantly altered the existing production practices and have not contributed to the development of quality management systems (Karray, 2012). Moreover, a study conducted by Kashiwagi et al. (2016) revealed that among Tunisian olive oil producers, only 28 firms in the survey sample (n = 113) introduced quality control measures (24.8%). However, this situation is no longer tolerable especially after the creation of the Euro-Mediterranean Free Trade Area and the removal of trade barriers. Quality management systems need to become more stringent as olive oil producers are transacting in a highly competitive environment. Furthermore, exports going to countries such as Japan, USA and Canada have to achieve high quality and regulatory compliance. These pressures combine with end customers' expectations and become strong drivers for olive oil producers and processors to participate in quality programs (i.e., HACCP) (Trautman, Goddard, & Nilsson, 2008). According to Euromonitor (2017), companies are focusing on innovations including glass and ceramic bottles and labels that stress health benefits as well as quality and provenance. They note that some brands are selling for as much as USD 78 for 500ml making them a luxury good. However, it is well known that

'fake' olive oil is one of the top 10 economically motivated adulterations. For example, blended olive oils are passed off as premium priced extra virgin olive oil and the country of origin (provenance) is often misstated (Squires, 2015).

3. Theoretical Framework of HACCP System in the Olive Oil Industry

Originally, HACCP was developed as a system for monitoring and control of food safety. It aims to provide deeper insights into operations which are subject to hazards and risks and to determine the preventive measures for anticipating them. In the context of olive oil industry, HACCP serves the purpose of specifying the rules to be followed by olive oil mills and packaging units regarding hygiene practices, environmental protection, hazard identification and evaluation of critical control points (Goula, Kiritsakis, & Kiritsakis, 2017). These latter points represent the key steps in the process that must be controlled to ensure the quality and safety preservation of the olive oil. Moreover, the critical limits are set to ensure that the acceptable level of each hazard at each critical control point is not exceeded (Walaa et al., 2013). The quality of the olive oil produced is determined by a set of significant factors that encapsulate the cultivation practices, harvesting methods, transportation, post-harvest storage, extraction process, storage of olive oil, and retail & distribution.

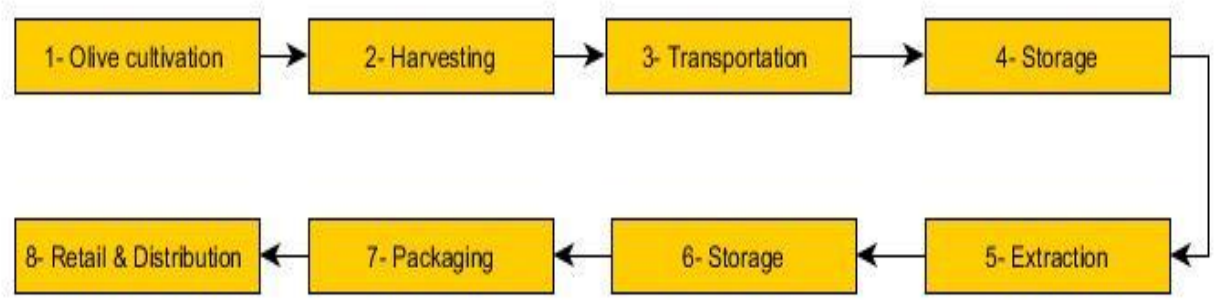

Figure 1. The typical process steps of olive oil (Authors)

Figure 1 shows the process steps of olive oil production. The critical control points will be defined and determined accordingly. All the points in this study pertain to the whole olive oil value chain and if they are identified, controlled and monitored, olive oil producers will prevent and eliminate possibilities of degrading the quality of the product.

- *CCP1_Risks associated with olive cultivation*

Olive cultivation involves all the activities necessary for the development of olives tree and fruit. The selection of varieties, the irrigation system and the sanitary treatments applied to the trees (e.g., pesticides, pruning, etc.) affect the olives quality and ripening rate (Rejeb, 2018; Apostolos Kiritsakis & Sakellaropoulos, 2017). Potential hazards in this stage include the excessive irrigation, the overuse of pesticides and the inadequacy of their timing, the infestation of pests, and the attack of weeds etc.

- *CCP2_Risks associated with harvesting*

Harvesting is the most critical step in the olive oil value chain because it accounts for a significant portion of production costs and influences the quality of produced olive oil (Abenavoli & Marcianò, 2013). Risks to quality are split between physical and chemical hazards. The former are directly associated with the olives fruits. They encompass the leaves and small branches attached to the collected olive fruits as well as the inappropriate scheduling and delay of harvesting. Moreover, the over-ripeness of fruits in the difficult to reach tree trunk area poses a risk to the quality (Boskou, 2006). The chemical hazards are increasing due to pesticides residues and the effects of improper harvesting methods. For instance, any breakage and damage of fruit causes the increase in free fatty acids and peroxides levels (Saglam, Tuna, & Gecgel, 2014), leading thus to a degradation in the quality of extracted olive oil in a later processing stage.

- *CCP3_Risks associated with transportation*

Before reaching the olive mills, the fruits need to be carefully packaged and transported in order to preserve the quality of the agricultural crop. Risks in this phase include the improper handling and packaging during the transportation activities. For example the olive fruits or 'drupes' can be squashed in plastic bags or sacks. They are susceptible to damage during loading and unloading at farms and processing plants (Goula et al., 2017), and risk the development of undesirable enzymatic reactions (e.g., oxidation). To put this in context, a common but inappropriate practice endorsed by many Tunisian farmers is the use of jute or plastic sacks for transportation. This habit increases the acidity of olive oil and negatively affects its quality (Kashiwagi et al., 2016).

- *CCP4_Risks associated with storage (olives)*

One of the most important factors for influencing olive oil quality is the post-harvest storage of olive drupes. Previous studies on this topic have shown many risks that could be encountered during the storage of drupes prior to milling (Brenes et al., 1993; García et al., 1996; Agar et al., 1998). The most common risk in storage is the extended holding time of drupes before oil extraction. The reason for this is the desynchronization in the timing between olive processing and harvesting. This is a common coordination

issue in Tunisia where the production of olives is very high and concentrated in a short time span. As a result, most olive mills are capacity constrained to deal with the high quantities of olives. Moreover, when the olives are stored for an extended period in plastic sacks or in deep and large mounds, they are subject to physical, chemical and biological hazards that affect the nutritional and sensory profile of the oil (Vichi et al., 2009). For example, the flavor of extracted oil could be classified as fusty, winey or musty due to, respectively, the degradative phenomena (i.e., loss of texture and damage of skin), the fermentation, and the considerable fungal invasion (or pathogens) during the fruit storage (Angerosa, 2002) .

- *CCP5_Risks associated with extraction*

Arguably, the quality of olive oil is directly dependent on the quality of the fruit from which it is extracted (García & Yousfi, 2006). Besides, the handling practices and operations implemented during the extraction process play a significant role in determining the quality of olive oil.

Figure 2. The extraction process (Authors)

As shown in figure 2, the extraction process encompasses the cleaning, malaxation or kneading, extraction, and separation of oil. Under certain circumstances, olives are harvested during harsh weather elements such as heavy rains, frosts and sometimes snow. Thus, olives might be squashed with contaminants such as mud, dust, dirt and moisture. Not only that, the harvested olives contain leaves, twigs, and sprigs that dramatically affect the fruit oil content (Vossen, 2009). For that reason, cleaning the olive drupes is necessary before malaxation because the presence of leaves and other materials intensify the green-leaf organoleptic property of oil causing a bitter and pungent taste (Giovacchino, 2013). However, the cleaning task (including leaves removal and washing) is subject to many potential risks and hazards. For instance, although washing drupes eliminates the presence of foreign materials, there is a risk of removing some pulp tissue and consequently result in oil losses (Giovacchino, 1996). Moreover, the excessive reuse of washing water for removing impurities may lead to bacterial contamination and induce adverse effects on the quality of olive oil. Similarly, contaminations may result from the use of any chemicals in the process (e.g., disinfectants, detergents etc.).

The malaxation or kneading introduces several contamination risks to the oil through equipment and humans (Tzia, Oreopoulou, & Kallisperi, 1997). These include the possible microbial contents, enzymatic pathways, and the formation of emulsions. Further, the degree of crushing, the malaxation temperature and time affect the concentration of the volatile compounds and the sensory characteristics of the produced oil (Angerosa, 2002). As a case in point, the intense crushing of olives by the metallic hammer crusher or mill stones for a long time and in high temperature results in off-odor formation. Potential risks involve contaminations caused by the state of the equipment used in the process (malaxer, hammer or disc crusher, rollers, machine lubricant oils or greases etc.) and the poor hygiene practices of workers. At the oil extraction stage, any inappropriate practices increases the formation of fatty acids, enzymatic reactions, and other microorganisms. Besides, the presence of impurities in water and unsanitary pressing mats will degrade the quality of olive oil. The final liquid containing the oil and vegetation water will be filtrated and separated by a standard process of decantation or centrifugation. The risks here might be associated with the inadequate pressure and decanter parameters, the water chemicals, and the emulsions etc.

CCP6_Risks associated with storage (olive oil)

Subsequent to the final extraction of olive oil and before reaching the packaging units, olive oil undergoes an intermediate storage step. The storage conditions affect the quality of olive oil and multiple risks are present. For example, the physical risks include the usage of unsuitable or unsanitary drums or containers that are rusted or permeable to oil, light and air. The improper sealing of containers increases the risk of foreign materials infiltration such as insects and dust. The stored oil might be subject to oxidation or contamination from the tank (e.g., bacteria, sediments, moulds and yeasts, etc.), the exposition to light, the high storage temperature.

CCP7_Risks associated with packaging

Packaging is a very critical step in the olive oil value chain. Aside from influencing the marketability of the products, the packaging serves to protect the olive oil until they reach consumers. Besides, the use of proper packaging helps not only to ensure the adequate shelf life for distribution and retail but also to keep contaminants at bay. The physical characteristics of the packaging material may have a considerable effect on the final quality of the oil, depending on the degree of the deteriorative interactions (Kiritsakis & Dugan, 1985). Previous studies on the impact of packaging on the olive oil quality show that olive oil stability is retained only if the olive oil products are protected for certain hazards like oxygen and light (Kanavouras, Hernandez-Munoz, & Coutelieris, 2004; Kiritsakis et al., 1998). Similarly, the packaging materials might

transfer chemical risks into the oil. For instance, the use of plastic bottles and containers causes the increase in peroxide values and facilitates the oxidation of olive oil due to their permeability (Issaoui et al., 2010) (Kiritsakis & Dugan, 1985). There is also a risk of photo-oxidation and decrease of shelf life in case of using transparent materials for bottling olive oil (Gutierrez, 1975; Mastrobattista, 1990; Akoh, 2017).

CCP8_ Risks associated with retail & distribution

Ineffective food safety and quality control in the distribution and retail stage can result in spoilage. Moreover, incorrect storage and handling along with various forms of illicit trade and food fraud may cause substantial financial losses including reputational damage and severe legal obligations (i.e., penalties, fines, lawsuits etc.) (Moyer, DeVries, & Spink, 2017). At retail outlets, the on shelf-storage conditions have a significant impact on the quality of olive oil. That is, the length of holding time in the store and the environmental factors (e.g., temperature, humidity, light etc.) might change the quality characteristics of the olive oil products. For example, the high intensity of light in the store can accelerate the oxidation of oil (Dabbou, 2011). Similarly, the longer olive oil products remain in retail and unsold impacts on the acidity of the oil and the intensity of rancidity.

Table 1: Generic HACCP Management Applied to the Olive Oil Industry (Authors)

Critical Control Points (CCPs)	*Monitoring Procedures*	*Preventive and Corrective Actions*
CCP1	Plant control (pruning, irrigation, light interception, tree spacing etc.) Pests control Pesticide and fertilizers monitoring (insecticides, disease pests) Fertility management	Organic cultivation Better cultivation management Avoid intensive irrigation, soil conditioners Maintenance and sanitation programs Optimal usage of pesticides, insecticides, and herbicides Appoint agronomist or specialists for regular monitoring before harvesting Document actions taken
CCP2	Heavy metals control Scheduling harvest time (appropriate stage of fruit maturity) Control olives ripeness Visual inspection of the collected olives Extension and moving of nets	Use of appropriate equipment for high fruit removal efficiency while reducing damages Better training of the usage of mechanical aids and machines used in harvesting (e.g., shakers) Avoid the use of "vareo" (shaking the tree with rods) Separate olives gathered from both the ground and the tree Reduce as much as possible twigs and leaves Document actions taken

CCP3	Transport monitoring (time, conditions) Careful loading of olives Visual monitoring	Good transportation handling, cleaning of trucks Avoid the use of rusted tractor pan or containers Avoid the use of plastics and jute sacks Use of open-mesh transportation and perforated boxes Document actions taken
CCP4	Monitor the storage conditions (temperature and time) Rejection of fruit batches that do not meet the requirement of the mills Visual inspection	Ensure better storage timing and temperature (5°C in air for at least 30 days could be recommended according to (Kiritsakis et al., 1998)) Regulate temperature, humidity Ensure the cleanness of storage to prevent mould formation Selection of appropriate unit loads that contain the olives Document actions taken
CCP5	- **Cleaning** Hygiene monitoring Visual inspection of washing water (color, odor etc.) Monitoring of the equipment Cleaning of chemical residues Optical inspection of the defoliator - **Malaxation** Monitoring the malaxation temperature, processing time, and velocity. - **Extraction and separation of oil** Monitor the processing time, water quality, temperature etc. Regulate the pressure or decanter parameter Control the hygiene practices (e.g., decanter and pressing mats etc.) Periodic optical inspection of the equipment	 Frequent renewal of the washing water Preventive programs of maintenance and cleaning Disinfection of equipment (e.g., defoliators) Cleaning efficiency Training personnel for good hygiene practices Preventive and corrective programs of maintenance, cleaning and disinfection of equipment Apply the recommended average malaxation time (60 min, 35° C) Reduce temperature in case of over-heating Plant predictive maintenance Improve the handling practices Operators training programs Remove any sediments Document actions taken
CCP6	Monitor the storage temperature Visual inspection of the tank deposits Control storage area (free from moisture, unpleasant aroma, light) Control oil from any traces of water, impurities, and solid residues	Absence of air Use of storage containers made from inert materials (stainless steel or inox) Remove any sediments from the tanks and containers Ensure that tanks are clean and dry Protect oil form intensive lighting Completely fill the tanker and the containers Loading tanks from the bottom to minimize the contact with the air Document actions taken

CCP7	Inspection of the packaging units Monitoring the hygiene conditions in the packaging units Monitoring of the equipment used in packaging (e.g., pumps, filters, volumetric fillers etc.) Control workforce hygiene	Use of dark glass in bottling, if transparent glass is used then bottles and small containers should be protected from light in the unit loads Integrity of labelling instructions Interacting with reliable suppliers of packaging materials Training programs for the workforce (personal hygiene, sanitary dressing and appropriate uniforms, proper product handling etc.) Document actions taken
CCP8	Site documentation Monitor time, on-shelf storage conditions (temperature, humidity, lights)	Regulate storage conditions in the store, humidity, light, temperature, keep olive oil products in dry places Palletization of unit loads for better transportation and handling Review preventive procedures Document actions taken

4. Possibilities and Challenges of HACCP implementation in Olive Oil Industry in Tunisia

4.1. Possibilities of HACCP

The adoption of a HACCP system by the olive oil producers in Tunisia is beneficial in various aspects. The system aims to identify, control and contain risks and hazards that might be encountered on the olive oil value chain. As we have previously stated, the system is applicable to the whole process of olive oil processing from farm to table. This would, in turn, confirm the compliance of the produced olive oil to the various food safety regulations and the very thorough due diligence practiced throughout all the value chain phases. Besides, the broad implementation of HACCP has the potential to enhance the industry reputation and increase exports from Tunisia. This is because the system is highly credible and recognized in global trade agreements through the World Trade Organization (Wallace, Sperber, & Mortimore, 2018). The weak competitive position of Tunisia compared to other dominant countries on the international market for olive oil (e.g., Italy, Spain, Greece) might be strengthened by the development and the sound application of HACCP system (Karray, 2006). Similarly, the Tunisian olive oil companies will have the ability to penetrate new markets and generate significant revenue streams while meeting the stringent requirements for high quality olive oil products.

Besides facilitating a safer value chain, the HACCP system shifts the focus from retrospectively controlling the quality to proactively curbing all probable risks and hazards in the olive oil value chain. In doing so, the Tunisian olive oil producers will reduce wastage and defects (e.g., sensory, aroma, color etc.). Moreover,

they can reduce the costs associated with loss of sales and ineffective end-product testing. Tighter controls will be exercised over the most critical and sensitive stages in the value chain. Thus, this allows the operators to engage in total quality programs and efficient traceability systems. A HACCP program in Tunisia builds capacity on food safety with farmers and processors and enables the sale of higher quality and traceability products with greater profit margins. HACCP facilitates regulatory requirements and the needs of certification bodies and leads to a more effective controls and supervision of the sector.

4.2. Challenges of HACCP Implementation in Tunisia

Although the implementation of HACCP promises many advantages to the Tunisian olive oil producers, there are still many barriers inhibiting its adoption. One of the most problematic issues is the lack of appropriate training in HACCP methodology (Taylor, 2001). In fact, the system induces many changes in the ways to manage the olive oil value chain to ensure quality and safety of the end product. The businesses involved in the sector are required to engage in capacity building including classroom training, frequent meetings and awareness programs regarding the best working, hygienic, and safety practices. In addition, firms need to engage with specialized teams and independent experts to increase the level of knowledge and understanding of microbiological and chemical issues. For the sake of doing so, the commitment of resources (e.g., time, money, and people etc.) is necessary. Furthermore, the move in this direction implies the incurrence of costs that are often prohibitive for some entities in the industry, particularly small and medium enterprises. Small and medium businesses generally have limited funds, older equipment and reduced bargaining power. Therefore, the costs of implementing a HACCP plan might outweigh the benefits of embedding it into the sector initially.

Another prevalent problem hampering the implementation of HACCP is the willingness and readiness of olive oil supply chain partners to cater to the needs of this quality management system. Similarly, the perception of the industry actors regarding the potential risks might be divergent and often conflicting. For instance, olive growers will only focus attention on the damage and contamination on the external surface of the olive fruits, while the olive mill plants will be more concerned with the control of the microbiological and chemical risks. This antagonism of interests and divergence in risk perception ends in confusion, information asymmetry and loss of control. The same applies to low-skilled workers who may have low motivation to learn, may resist change and not willing to engage in learning and mastering the necessary skills for absorbing the prerequisites of the HACCP plan. Lastly, any significant industry upgrading might

lead to the failure of the existing HACCP system since the processes are continuously changing due to many dynamics (e.g., technologies, national and international regulations, trade standards, foodborne diseases etc.)

5. Conclusion

In this paper, we have developed a HACCP plan that covers the olive oil value chain, from olives cultivation to the storage of the final products in the retail store. HACCP procedures and steps are developed to address all the potential risks and hazards that might be encountered in the supply chain. Unlike previous studies on the subject that are exclusively based on the development of a HACCP plan at the olives mill plants level, we emphasize the exploration of the hazards and risks preceding and succeeding the operations of extraction units. In doing so, the HACCP plan will be fully-fledged and help to preserve the quality of olive oil products.

The implementation of the HACCP plan does not only guarantee the high quality of olive oil products but it could contribute to the country economy. Being a valuable commodity, Tunisia could derive many benefits from the sound and correct application of HACCP in the olive oil industry. This falls within the remit of olive oil supply chain stakeholders (i.e., farmers, olive oil processors, packaging units, distributors, exporters, certification bodies etc.).

By establishing these preventive procedures, the enhanced traceability of olive oil can be linked to data from analytical laboratories or government agencies who verify the safety and authenticity of the olive oil. Moreover, demonstating batch or lot traceability facilitates a rapid recall of the product should a contamination occur (Kumar, 2007). Furthermore, the adoption of HACCP in the olive oil industry promises many advantages to the operators, namely, marketing and branding benefits.

Despite the possibilities of a HACCP system in the olive oil industry in Tunisia, its implementation might be challenging due to the limited technical expertise, resources, and the organizational reluctance. The difference in perceiving hazards and risks pertaining to the olive oil value chain might lead to control dilution. The need to keep the HACCP system updated with the industry upgrade, the progress of actions, and the new dynamics is a challenging task to undertake. It should be also noted that according to scholars, current food safety management control systems (such as HACCP) are not specifically designed for fraud control or mitigation due the intentional nature of the fraud and subsequent vulnerability to deception

(Levine, 2014; van Ruth, Huisman, & Luning, 2017). Rather, an approach that differs from the common safety ploys is imperative to ensure both food safety and fraud prevention (Spink et al., 2017).

The present study lays the groundwork for further emperical research related to the factors of implementing the HACCP quality management system in the olive oil industry and the barriers that inhibit its effective use. Besides, the cost-benefit analysis of HACCP among Tunisian olive oil businesses leaves a significant potential for future investigation.

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Customer Brand Engagement and Brand Loyalty Insurance Users in Bali Province

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Abstract

Customer brand engagement is a way for companies to make brands a meaningful part of consumer conversations by increasing consumer engagement to makes brand conversations on social media. This study aims to examine the effect of customer brand engagement, consumer participation, and brand satisfaction on the loyalty of insurance users in Bali Province. Data collection was done by distributing questionnaires to respondents who had participated in the insurance discussion that they used on Facebook with a sample size of 120 people. The analysis technique used is path analysis and Sobel test. The results show that customer brand engagement influences consumer partisipation positively significant, as well as consumer participation that has a positive and significant effect on brand satisfaction, consumer participation has a significant and positive effect on brand loyalty, and brand satisfaction has a significant and positive effect on brand loyalty. The results also show that brand satisfaction is able to mediates the effect of consumer participation on brand loyalty.

Keywords: customer brand engagement, brand loyalty

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Keywords: customer brand engagement, brand loyalty

1. Introduction

The company continuously strives to interact and maintain long-term relationships with customers and understand the factors that influence customer loyalty. Technological development provides an important role for companies in interacting with customers (Flores and Parraga, 2015). Companies in interacting with consumers currently use social

media. Customer involvement is seen as an important phenomenon in social media, such as *chat*, *blogs*, *videos,* and brand communities (Brodie *et al.*, 2011a; Dessart *et al.,* 2014). Companies that do not have a customer engagement strategy can lose the opportunity to interact with customers and build long-term relationships .

Customer engagement refers to customer behavior towards a brand or company . *Customer engagement* in narrow interpretations is often referred to as *customer engagement behavior* (CEB). Van Doorn *et al.* (2010) argue that *customer engagement behavior* includes *word of mouth* , recommendations, helping other customers to consume better, *blogging* , writing reviews, and making suggestions to improve the consumption experience. A similar view is explained by Bijmolt *et al.* (2010) which distinguishes three customer engagements : (1) *customer complains ing behavior,* (2) *word-of-mouth (WOM),* and(3) *customer co-creation behavior* .

Jaakkola & Alexander (2014) suggest two general types of customer engagement behavior, namely (1) customer communication about the company or brand where customers can get new customers for the company through referral programs with company incentives, or influence other customers, consumers on their own initiative do *word -of-mouth* , *blogging* and other forms of customer-to-customer interaction and (2) customer involvement in product development and innovation (customers help increase or develop company offerings by providing feedback, ideas and information, or participating in product design or assembly).

Social media serves as a place for customers to share feelings and thoughts (Schau *et al.,* 2009). More and more companies are investing time and resources in the organizational community on social media and Facebook pages (Shankar and Bhatra, 2009; Vries *et al.* , 2012; Laroche *et al.,* 2012) in the hope that consumers will participate in positively encouraging *engagement* (Brodie *et al.,* 2011b; Hollebeek, 2011a, 2011b). *Customer engagement* can have a positive and negative impact on a company (van Doorn *et al.,* 2010; Brodie *et al.* , 2011). Positive *customer engagement* can include posting positive brand messages on the *blog* . Negative *customer engagement* can occur when the customer regulates public action against the company. Thus, viewed from a managerial perspective, the effect of*customer engagement* can also be positive and negative for a company.

Customer satisfaction is the key in creating customer loyalty (Espejel *et al.* , 2008). Customer satisfaction is a feeling of pleasure or disappointment that arises from perceptions of the actual performance of the product (Kotler and Keller, 2009: 139). Customer loyalty will arise when

consumers feel satisfied with the product they consume (Jayaputra, 2009). Increasing customer satisfaction is the responsibility of the company to maintain customer loyalty.

Everyone certainly has a risk to body and soul that needs to be protected from harm that cannot be predicted (Syamsiar, 2013). The existence of these concerns has encouraged someone to seek protection for themselves or their families from the various dangers that threaten to become insurance participants. Like banks, insurance companies operate in a very competitive environment and customers are faced with overwhelming choices (cxm.co.uk) The insurance sector is known to have low transfer barriers, as many as 17 percent of the customer base switch insurance providers every year (Lavik and Schjoll, 2012) This condition is important for insurance companies to gain knowledge about factors in building and maintaining brand loyalty. Brand loyalty shows the desired behavior with respect to the company's brand or service. The need for insurance users at this time wants insurance services that can provide more than the benefits of protection, insurance users also want insurance in line with lifestyle and *passion* the user.

Innovation in technology-based insurance companies can be used by insurance companies in increasing customer loyalty, especially at this time there has been a lifestyle shift in young people who are increasingly easy to understand information technology. Based on data from the Financial Services Authority (OJK) shows that in the third quarter of 2017 life insurance premium income increased 20 percent to Rp 139.27 trillion. But insurance penetration is still at 2.99 percent of the lower Gross Domestic Product (GDP) compared to other countries in Asia such as Singapore, Malaysia and Thailand which reached more than 5%. In addition, the results of research by the Financial Services Authority (FSA) in 2016, also showed the level of insurance use in Indonesia had only reached 11.81 percent. That is, out of 100 Indonesians, only 11 have insurance policies (http://www.industry.co.id).

The purpose of this study is to explain: (1) the influence of *customer brand engagement* on consumer participation, (2) the influence of consumer participation on brand satisfaction, (3) the influence of consumer participation on brand loyalty, (4) the influence of brand satisfaction on brand loyalty, and (5) the role of brand satisfaction mediates the influence of consumer participation on brand loyalty carried out on insurance users in the Province of Bali based on the phenomenon described above.

Customer Brand Engagement has received a lot of attention from various disciplines such as psychology, organizational behavior and marketing (Gambetti and Grafigna, 2010). *Customer*

Brand Engagement is found to be an important element in the online brand community (*Brodie et al*, 2011a) and especially social media such as Facebook which is a brand-based community (Gummerus *et al.*, 2012; Habibi *et al.*, 2014). At this time consumers are increasingly proficient in using the internet, organizations that develop online communities through corporate websites, online portals or social networking sites (Zheng *et al.*, 2015). *Customer Engagement Marketing* is the way a natural company makes a brand a meaningful part of the conversation and life of consumers by increasing customer involvement directly and continuously in shaping brand, experience and community conversations (Kotler & Armstrong, 2016: 42).

Customer participation is the extent to which a customer places effort and resources in the production process so as to take an active part in consuming and producing value (Nysveen and Pedersen, 2014). Customer participation can be proven in the active role of customers sharing information with the company, customer participation must be considered as a component in *co-production* . (Ranjan and Read, 2014). Etgar (2008) defines *co-production* as the participation of customers in one or more activities in the corporate network chain (design, production, delivery, use).

Customer satisfaction is a feeling of pleasure or disappointment that arises because of comparing perceived performance of the product or outcome to brand expectations (Kotler and Keller, 2009: 139). The results of the study by Consuegra *et al.* , 2007 states that satisfied customers will have the desire to repeat previous purchases. Customer satisfaction is created when the company is able to meet the needs of their customers well (Moraga *et al* ., 2008). Customer satisfaction also affects consumer loyalty (Sondoh *et al.* , 2007). Consumers feel they have made the right decision when their satisfaction is met (Sulistiyanto and Soliha, 2016).

Loyal customers are those whose enthusiasm for the brand or product they use. Loyalty is the attitude of enjoying a product that is represented in a consistent purchase of the product with the same brand all the time. Loyal consumers will not only use products with the same brand in the future, also recommend products that have been consumed by others (Yu and Dean, 2000). The best that can be done by a company in maintaining customer loyalty is by maintaining good relationships with customers, as well as providing *rewards* to loyal customers (Divet *et al.* , 2003).

Customers who are loyal to their purchase decisions no longer consider the factors that influence the choice, because it has been embedded in them that the product or service purchased is in line with expectations and able to meet the needs. L ayanan loyalty is the extent

to which a customer makes repeat purchase behavior of a product, have a positive attitude toward the product (Gremler and Brown, 1996).

2. Hypothesis

Customer brand engagement is an important element in the *online* brand community (*Brodie et al*, 2011a) and especially social media such as Facebook which is a brand-based community (Gummerus *et al.*, 2012; Habibi *et al.*, 2014). *Customer engagement marketing* is the way a natural company makes a brand a meaningful part of the conversation and life of consumers by increasing customer engagement directly and continuously in shaping brand conversations, experiences and society (Kotler & Armstrong, 2016: 42). Some research results related to *customer brand engagement* show that*customer brand engagement* positively influences brand satisfaction (Van Doorn *et al.*, 2010; Hollebeek, 2011a) and brand loyalty (Brodie et al., 2011a; Hollebeek, 2011a, 2011b). Other researchers have suggested that customer participation is an antecedent of *customer brand engagement* (Vivek, 2009; Nysveen and Pedersen, 2014; Ramaswamy and Gouillart, 2010). Based on the description , the proposed hypothesis is :

H_1: *Customer brand engagement* has a positive effect on consumer participation .

A company creates a *platform* for value creation that matches the customer's interest to encourage customer participation. Participation can increase brand satisfaction personally and subjectively and influence brand loyalty positively. When customers participate in *co-production activities* , they tend to share new ideas, suggestions, and problems with the company (Chen *et al.*, 2011). Customer satisfaction is a feeling of pleasure or disappointment that arises because of comparing perceived performance of the product or outcome to brand expectations (Kotler and Keller, 2009: 139). *Co-production*has been found to be a positive predictor of loyalty (Auh *et al.*, 2007; Hosseini, 2013) and satisfaction (Ranjan and Read, 2014; Flores and Vasquez-Parraga, 2015). Customers who are willing to participate in brand activities are considered more satisfied (Bendapudi and Leone, 2003). Based on the description, the proposed hypothesis is:

H_2: Consumer participation has a positive effect on brand satisfaction .

Customer participation is the extent to which a customer places effort and resources in the production process so as to take an active part in consuming and producing value (Nysveen and Pedersen, 2014). Customer participation can be proven in the active role of customers sharing information with the company, customer participation must be considered as a component in *co-production* . (Ranjan and Read, 2014). Brand loyalty is one of the keys to

marketing results. Loyalty refers to the commitment of consumers to consider unique values associated with the brand (Chaudhuri & Holbrook, 2001). Zheng*et al.* (2015) states that Facebook user participation has a positive effect on brand loyalty. Based on empirical results in the study, the hypotheses that can be proposed in this study are:

H_3: Consumer participation has a positive effect on brand loyalty.

In interactive customer social media, customers who are willing to participate in online communities influence brand satisfaction and loyalty. Loyal customers are those whose enthusiasm for the brand or product they use. Loyalty is the attitude of enjoying a product that is represented in a consistent purchase of the product with the same brand all the time. Loyal consumers will not only use products with the same brand in the future, also recommend products that have been consumed by others (Yu and Dean, 2000). The results of Jayaputra's (2009) research, Luthfi (2011), and Rachmawati (2014) found that satisfaction has a positive and significant effect on customer loyalty. Based on empirical results in the study, the hypotheses that can be proposed in this study are:

H_4: Brand satisfaction has a positive effect on brand loyalty.

The mediation role assumed by the brand satisfaction variable on the relationship between customer participation and brand loyalty is tested using the sobel test. The results of Solem's (2013) research show that on social media, *customer brand engagement* positively influences customer participation, resulting in positive brand satisfaction and loyalty. The results of Solem's (2016) research confirm that brand satisfaction significantly mediates the relationship between customer participation and brand loyalty. Based on empirical results in the study, the hypotheses that can be proposed in this study are:

H_5: Brand satisfaction significantly mediates the influence of consumer participation on brand loyalty

3. Method

The research design determines the success in achieving good and useful research results. This study uses a quantitative research design. This research was conducted in Bali Province. The

subjects in this study were insurance users in Bali Province who had participated in *online* brand communities on social media. The population in this study were those who had participated in the *online* brand community . The number of samples in this study were 120 respondents . Responden in this study must have a certain criteria, the characteristics of this sample are: (1) the users of one brand of insurance and live in Bali and (2) s already participated in on Facebook related to their existing insurance.

Based on its nature , the data in this study consisted of quantitative data and qualitative data. Quantitative data in this study is the amount of data from the respondents 'assessment of the research variables, and respondents' characteristics (age and monthly expenditure). Qualitative data in this study include respondent characteristics (name, gender, and education) Based on the source , the data in this study consisted of primary data and secondary data. Primary data in this study were obtained through distributing questionnaires to respondents who were in accordance with the established criteria.Secondary data in this study were obtained by documenting publications and other sources.

Data collection in this study was done by distributing questionnaires to respondents who had met the criteria according to the desired criteria. The questionnaire in this study is a type of questionnaire with a list of closed statements, meaning that the respondent can only answer one or several answer choices prepared by the researcher. The research instrument is used to measure the value of the variables under study (Sugiyono, 2013: 131). The instrument test in this study consisted of: (1) the validity test that the instrument is said to be valid if the correlation coefficient (r) 3 0.3 and (2) the reliability test is the instrument said to be reliable if the *alpha* value is greater than 0.6. The data analysis technique used to solve the problem in this study is *path analysis* by testing the direct and indirect effects of each variable on the dependent variable accompanied by the Sobel Test. Path analysis is used because this study is designed to estimate the causality relationship on variables that are tiered to the theory.

4. Results and Discussion

Respondents were reviewed based on several demographic variables namely gender, age, last education, employment and income / pocket money. In terms of gender, female respondents

dominated 62 questionnaires. Based on age criteria, the majority of respondents aged 17-25 years are as many as 60 people. Judging from the latest education, scholars dominate the distribution of respondents as many as 61 people. Based on job criteria, private employees dominate the distribution of respondents as many as 63 people. Judging from income / pocket money, Rp. 2,500,001 to Rp. 4,000,000 per month dominated the distribution of respondents as many as 59 respondents.

An instrument is said to be valid if *Pearson Correlation* is greater than 0.30. After testing the validity of the instrument, it was found that all statement indicators in the variable *customer brand engagement* , consumer participation, brand satisfaction, and brand loyalty had a *Pearson Correlation* value greater than the number 0.30 so that all indicators in this study had fulfilled the data validity requirements . Reliability testing was carried out on the instrument with the *cronbach's alpha* coefficient . If the *cronbach's alpha value* is greater than 0.60 then the instrument is used reliably. The results of the instrument reliability test in this study indicate that all variables are greater than 0.60 so the statement on the questionnaire can be said to be reliable.

Based on the calculation of the standard error value, the results of e_1 or standard error of consumer participation variable is 0.768, e_2 or standard error of variable brand satisfaction. amounting to 0.941, and e_3 or standard error varia bel brand loyalty of 0.768. The results of the total determination coefficient are calculated as follows:

$$R^2m = 1 - (e_1)^2 (e_2)^2 (e_3)^2$$

$$= 1 - (0.768)^2 (0.941)^2 (0.768)^2$$

$$= 0.692$$

The total determination value of 0.692 means that 69.2% of the variation in loyalty to insurance users in Denpasar is influenced by variations in *customer brand engagement* , consumer participation, and brand satisfaction, while the remaining 30.8% is explained by other factors not included.

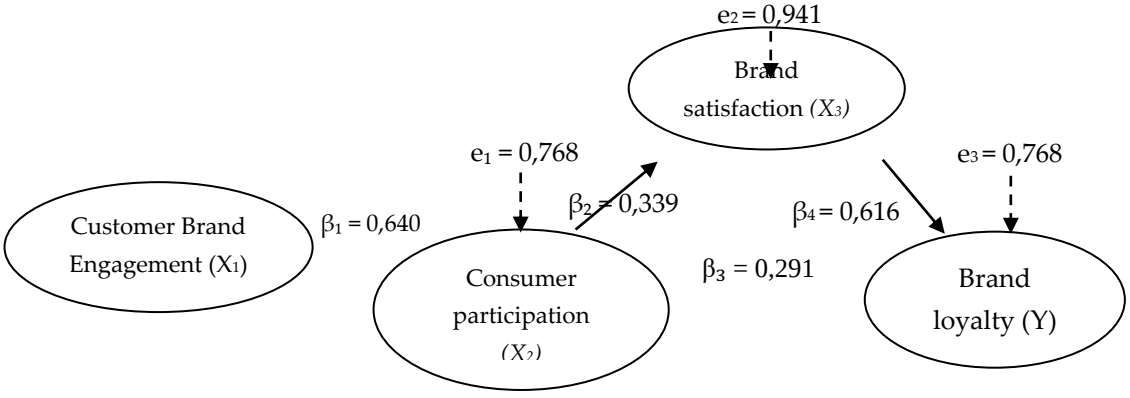

Figure 1. Validation of the Final Path Chart Model
Source: Data processed, 2018

The structural equation of path analysis in this study is on substructural 1 and substructure 2 as follows:

$X2 = 0.640X1 + e_1$

$X3 = 0.339X2 + e_2$

$Y = 0{,}291X + 0{,}616X3 + e_3$

Based on the final path diagram model in Figure 1 , it can be calculated the amount of direct influence, indirect effect , and the total effect between variables. Calculation of influences between variables is summarized in Table 1.

Table 1. Direct and Indirect Influence and Total Influence and total Influence

Variable Influence	Direct Influence	Indirect Influence Through Brand Satisfaction ($\beta_2 \times \beta_4$)	Total Influence
X1 → X2	0.640	-	0,640
X2 → X3	0.339	-	0.339
X2 → Y	0.291	0.207	0.498
X3 → Y	0 , 616	-	0.616

Source: Data processed, 2018

Based on Table 1, it can be seen that consumer participation has a direct influence on brand loyalty and indirect influence through brand satisfaction. The magnitude of the indirect influence coefficient can be calculated by multiplying the path coefficient from consumer participation to brand satisfaction with the path coefficient of brand satisfaction to brand loyalty of 0.339 x 0.616 = 0.207. The results of the indirect influence coefficient are smaller than the direct effect (0.207 < 0.291), so it can be said that the variable of brand satisfaction is as a mediating variable in mediating the effect of consumer participation variables on brand loyalty variables.

Based on the calculation of The Sobel test, obtained the value of t arithmetic of 5, 431 which means greater than t table (3.486> 1.981). This result means that brand satisfaction is able to mediate the influence of consumer participation on brand loyalty. Thus, H_5 which states

that brand satisfaction mediates the effect of consumer participation on brand loyalty is significantly accepted.

4.1. Effect of *Customer Brand Engagement* on Consumer Participation

The first objective of this research is to explain the influence of *customer brand engagement* on consumer participation. The test shows that the positive beta coefficient is 0.640 with a significance level of 0.000 (less than 0.05) which means that H_1 is accepted. The test results show that the variable *customer brand engagement* has a positive direction and has a significant effect on consumer participation. These results indicate that the higher the *customer brand engagement* of insurance users in Denpasar City, the higher the level of participation in social media such as Facebook. On the contrary if the *customer brand engagement is* low, the level of their participation in social media will be low. The results of this study reinforce previous studies that have been carried out by Van Doorn *et al.* (2010), Hollebeek (2011a), and Solem (2013) who obtained positive and significant results between *customer brand engagement* and consumer participation.

4.2. Effect of Consumer Participation on Brand Satisfaction

The second objective of this study is to explain the effect of consumer participation on brand satisfaction. The test results show that the positive beta coefficient is 0.339 with a significance level of 0.000 (less than 0.05) which means that H_2 is accepted. These results indicate that consumer participation has a positive and significant effect on brand satisfaction. The interpretation of the results of this study is that the higher the level of participation of insurance users in the City of Denpasar in talking about insurance on social media such as Facebook, the level of satisfaction on their insurance brands will now increase. Conversely, if the participation rate is low, then brand satisfaction will be low. The results of the study are in accordance with previous studies which prove that consumer participation has a positive and significant influence on brand satisfaction as did Ranjan and Read (2014), Flores and Vasquez-Parraga (2015) , and Bendapudi and Leone (2003).

4.3. Effect of Consumer Participation on Brand Loyalty

The third objective of this research is to explain the effect of consumer participation on brand loyalty. The test results show that the positive beta coefficient is 0.291 with a significance level of 0,000 (less than 0.05) so that $H_{3\ is}$ accepted. This result means that consumer participation has a positive and significant effect on brand loyalty. The interpretation of these results is that the higher the level of participation of insurance users in Denpasar City in the discussion of insurance on social media such as Facebook, then the level of loyalty to their insurance brands will now increase. Conversely, if the participation rate is low, then brand loyalty will be low. The results of this study are in line with several previous studies conducted by Auh *et al.* (2007), Hosseini (2013), and Zheng *et al.* (2015) which results that brand satisfaction has a positive and significant effect on brand loyalty .

4.4. Effect of Brand Satisfaction on Brand Loyalty

The fourth objective of this study is to explain the influence of consumer participation on brand loyalty. The test results show that the positive beta coefficient is 0.616 with a significance level of 0.000 (less than 0.05) so that $H_{4\ is}$ accepted. The test results show that the variable of brand satisfaction has a positive direction and has a significant effect on brand loyalty. These results indicate that the higher the level of satisfaction of insurance users in the City of Denpasar on their current insurance brand, the level of loyalty to the brand will increase. Conversely, if the satisfaction level is low, then brand loyalty will be low. The results of this study reinforce some of the previous studies conducted by Jayaputra (2009), Luthfi (2011), and Rachmawati (2014) who found that brand satisfaction has a positive and significant effect on brand loyalty .

4.5. The Role of Brand Satisfaction Mediates the Effect of Consumer Participation on Brand Loyalty

The final objective of this study is to explain the role of brand satisfaction in mediating the influence of consumer participation on brand loyalty. The results of testing the indirect effect of consumer participation on brand loyalty through brand satisfaction obtain a smaller coefficient than the direct effect of 0.207 <0.291. Meanwhile, testing with the Sobel test shows that the t count value is 3.486 which is greater than t table, namely 1.981 so that $H_{5\ is}$ accepted. These results indicate that the variable brand satisfaction is able to mediate the influence of consumer participation on brand loyalty significantly.

In connection with these results, it can be interpreted that the participation of insurance users in the City of Denpasar in talks about insurance through social media such as Facebook is able to increase satisfaction with their current insurance brands, resulting in an increase in brand loyalty. The results of this study are consistent with the previous research conducted by Solem (2016) which explains that brand satisfaction significantly mediates the relationship between consumer participation and brand loyalty.

5. Conclusions and Suggestions

Based on the results of the discussion, several conclusions can be drawn. The first conclusion is that *customer brand engagement* has a positive and significant effect on consumer participation. The results of this study indicate that the higher the *customer brand engagement* , the higher the level of participation of insurance users in Denpasar in the discussion of insurance on social media such as Facebook, and vice versa if the *customer brand engagement is* low, consumer participation will also be lower.

The second conclusion is that consumer participation has a positive and significant effect on brand satisfaction. The results of this study indicate that the higher the level of participation of insurance users in Denpasar in talking about insurance on social media such as Facebook, the higher the satisfaction of their current insurance brands, and vice versa if consumer participation is low, brand satisfaction will also be lower.

The third conclusion is consumer participation positive and significant influence on brand loyalty. These results indicate that the higher the level of participation of insurance users in Denpasar in the discussion of insurance on social media such as Facebook, then the loyalty of their insurance brand will also be higher now, and vice versa if consumer participation is low, brand loyalty will also be lower.

The fourth conclusion is that brand satisfaction has a positive and significant effect on brand loyalty. These results indicate that the higher the level of satisfaction of insurance users in Denpasar in their current insurance brand, the higher brand loyalty will be, and vice versa if brand satisfaction is low, brand loyalty will also be lower. The last conclusion is brand satisfaction able to mediate the influence of consumer participation on brand loyalty. These results indicate that the participation of insurance users in Denpasar in talks on insurance

through social media such as Facebook can increase satisfaction with their current insurance brands, resulting in an increase in brand loyalty.

Suggestions that can be recommended based on the results of research, namely *customer brand engagement* proved to be able to increase the participation of insurance users in Denpasar in talks about insurance on social media such as Facebook. This can be considered by insurance providers to shape and pay attention to conversations with consumers on social media about insurance so that it can increase consumer involvement directly in better two-way communication. Consumer participation level the high proved to be able to increase the satisfaction and loyalty of insurance users in Denpasar on their current insurance brand. Therefore, providing a good *platform* on social media as a place for consumers to talk about insurance should be the concern of insurance providers. When participation or involvement of insurance users through social media is high, then the creation of satisfaction with the insurance brand they use, so that a loyalty arises or in other words consumers will be more loyal to the insurance brand they use.

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Factors Affecting Investors' Satisfaction in Industrial Zones and Results in Investment Attraction in Industrial Zones in Binh Dinh Province, Vietnam

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Abstract

This study analyzes the factors affecting the level of satisfaction of investors and results of attracting investments in industrial zones. Research is accredited with 156/185 investors in industrial zones in Binh Dinh province (central Vietnam) with the support of SPSS software. Research findings show that the impact level of factors which attracting investment in industrial zones are arranged sequentially, from high to low as follows: investment policies and investment in developing technical infrastructure of industrial zones, human resource management, the total area of land leased and labor sizes of enterprises, and the factors affecting investors' satisfaction in the IZs as follows: invest in developing social infrastructure of industrial zones, investment in development of technical and social infrastructure of industrial zones, advantages of investment industry, management and support of local government. Finally, Research offers suggestions policy drawn from research results.

Keywords: Industrial zones, investment attraction in industrial zones, investors's satisfaction level

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Abstract

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1. Introduction

Along with the comprehensive innovation in economy, the formation and development of industrial zones (IZ) in Vietnam has created a new infrastructure modernization, contributing to the rapid expansion of capital and become the important factor affecting the GDP growth rate, job creation and creating multiple additional income according to the final report on activities of model industrial zones, economic zone in 2017 of the Ministry of Planning and Investment, "Since

established until now, foreign direct investment capital into industrial zones, annual accounts for 35% - 40% of Vietnam's total registered additional capital; particularly, the industrial sector accounts for nearly 80%. Stemming from this important role, attracting investment in industrial parks has been interested by many researchers in many aspects such as investment decisions of investors, results of investment attraction, satisfaction of investors. This study will analyze the factors affecting to two aspects are results of investment attraction and satisfaction of investors in industrial zones, thereby determining the importance of these factors to attract investment in industrial zones and and offering solutions to increase investment attraction in industrial zones.

2. Theoretical foundations and research model

2.1. Theoretical foundations

From a macro perspective, according to Dunning, three factors are ownership advantage, location advantage and advantages of internal cohesion of the enterprise to answer three questions: why multinational companies want to invest abroad, which locations are selected for investment and how does implementation of investment. In the cost approach, Badri (1996) collected data of a total of 2125 CEOs of companies in 23 countries worldwide and indicated that the main factors affecting industrial location choice of investors is transport infrastructure, labor, materials, markets, industrial clusters, government support and management, taxes, climate and social communities.

Nguyen Dinh Tho (2009) studied the factors affecting investors' satisfaction including basic business infrastructure (basic infrastructure, labor, land use right, school quality). , Local government support (trade support, investment incentives, public services) and quality of life. Nguyen Manh Toan (2010)concluded that the technical infrastructure development is the most important factor, The following are respectively incentives and investment support of the local government; low operating costs; potential market, geographic location and social infrastructure affects the decided to choose the location to invest in local of investors. Dinh Phi Ho (2012) used survey data from 226 enterprises in industrial zones in Vietnam to assess factors affecting investment attraction in industrial zones. The results show that the infrastructure factor is the most influential factor to attract investment in industrial zones besides the investment policy regime;

living and working environment; investment industry advantages; quality of public services; local brand; human resources; competitive input costs.

2.2. Proposed research model

The author builds a research model based on the research of Nguyen Dinh Tho (2009) and Dinh Phi Ho (2012) as follows:

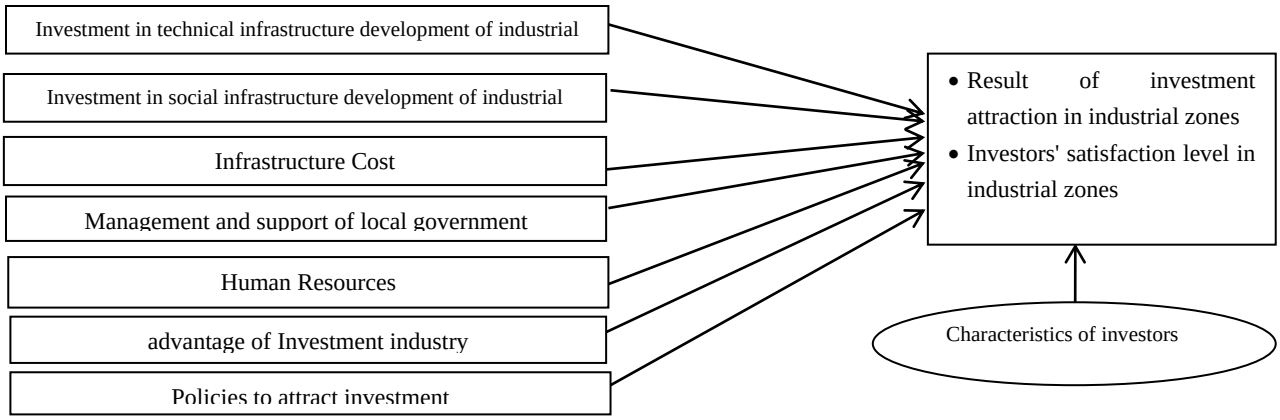

Figure 1: Model of evaluation of factors affecting the results of attracting investment in industrial zones and investors' satisfaction in IZs

Research model proposed independent variables, control variables as follows:

i. Control variable: The author uses control variables as characteristics of the investor. Stiglitz (1988) argues that investors must always make decisions to carry out a certain investment activity. Studies by Nguyen Minh Ha, Nguyen Duy Khuong (2014), Nguyen Phuc Nguyen (2013) have demonstrated the relationship between investors' characteristics and investment attraction. Referring to previous studies, the author uses the characteristics of investors as area of land leased and labor sizes

ii. Independent variables:

Investment in infrastructure development of industrial zones: Based on the content of the investment activity in infrastructure development in industrial zones and refer to some previous studies of Nguyen Dinh Tho (2009), Dinh Phi Ho (2012); Ha Nam Khanh Giao and colleagues (2015) separated the factor "investment in developing infrastructure of industrial zones" into two factors: investment

in developing technical infrastructure of industrial zones and investment in developing social infrastructure of industrial zones.

Human Resources: Human resource is the entire professional process that people accumulate; it appreciated the income potential in future (Begg et al., 2007). The author uses the following criteria to measure human resources based on previous studies, especially of Dunning (1997), Dinh Phi Ho (2012).

Policies to attract investment: Rosenfeld (1996) found a positive impact of policies on investment cooperation in Denmark. Similarly, Kipping (1996) also discovered the role of the government in developing industries in France and Germany. The author uses the criteria to measure investment policies based on previous studies by Dunning (1997), Kotler (2002), and Ha Nam Khanh Giao and colleagues (2015).

*Management and support of local government: a*ccording to Vu Minh Khuong, Haughton (2003), Malesky et al. (2009) argue that local government efforts are a very important factor to improve the investment environment and attract investment in the locality and Industrial zone. Supportation can from the government including policies for socio-economic development of the state in general; besides that also from the local specifically the Industrial Zone Management Board of the province / city. Author based on research by Barro et al (1997), Nguyen Manh Toan (2010), the survey PCI 2014 to propose criterias for measuring this factor.

Investment industry advantages: The investment industry advantage can be the working relationships between support companies and localities, input suppliers can create favorable conditions for the process of innovation and upgrading (Porter, 1998). Reference to the study of Dunning (1997), Kotler (2002) to select criterias to measure the advantage factor of the investment industry

Cost for use of infrastructure: Studies of Kotler (2002), Nguyen Manh Toan (2010) agreed that a reasonable operating costs will be an important factor affecting the investment attraction.. References from previous studies of Nguyen Manh Toan (2010) to develop criteria for measuring the cost for use of infrastructure

iii. Dependent variable

Result of attracting investment in industrial zones: In this study, the author uses the scale of investment capital disbursed

Satisfaction level of investors in industrial zones: according to Kotler (2000), Satisfaction as "a person's feelings of pleasure or disappointment resulting from comparing a product's perceived performance in relation to his or her expectations". The scale of investors' satisfaction in the IZ is based on the research of Nguyen Dinh Tho (2009) and Dinh Phi Ho (2012).

3. Research findings

3.1. Research area

The research area is located in industrial zones in Binh Dinh province, which is a province in the South Central Coast of Vietnam. By the end of December 2015, in the industrial zones in Binh Dinh province, there were 185 investors with 219 investment projects. The author with the help of the Economic Zone Management Board in Binh Dinh Province has sent the survey to all 185 investors in industrial zones. As a result, the author received 170 responses with 91.89% overall. After cleaning, remove invalid votes (blank, incomplete) and 156 votes reached 84.32% compared with the overall.

Table 1: Descriptive statistics of sample by occupation

Criteria	Number of enterprise	Rate compare with overall
Forest products processing	45	25,47%
Paper material (shavings)	12	7,05 %
Granite processing	22	12,94%
Mechanical and construction materials	11	6,48%
Paper processing, packaging	10	5,88 %
Animal feed	13	7,65%
Agricultural processing	21	12,35%
Supporting industries	9	5,3%
Other professions	27	15,88 %

Source: *Compiled by authors from research results*

3.2. Scale and quality control scale

Based on the theory proposed by the author, synthesize and complete the scales for the factors and variables in the model. The scales used by the author are based on SERVQUAL (Parasuraman) and based on the scale of studies of Nguyen Dinh Tho (2009) and Dinh Phi Ho (2012). The criteria of the research model are as follows:

Table 2: Criteria of research model

	SCALES	KÍ HIỆU
I.	**Investment in developing technical infrastructure of industrial zones**	**HTKT**
1	Convenient transportation infrastructure	HTKT1
2	Stable power supply system	HTKT2
3	Stable water supply and drainage system	HTKT3
4	Green infrastructure are well invested	HTKT4
5	Convenient communication system	HTKT5
6	Waste treatment system is well invested	HTKT6
II.	**Investment in developing technical infrastructure of industrial zones**	**HTXH**
1	Medical infrastructure investment meeting the demand	HTXH1
2	School system satisfies the demand	HTXH2
3	Entertainment service system satisfies demand	HTXH3
4	Housing infrastructure satisfies the needs	HTXH4
III.	**Human resources**	**NNL**
1	Labor quality meets the requirements of investors	NNL1
2	Abundant labor resources	NNL2
3	The Cost of Cheap Labor	NNL3
4	Labourers have career skills, and abilities that are good apply in technology	NNL4
5	Hiring good managers the easy way in locality	NNL5
6	Highly disciplined labours	NNL6
IV.	**Investment policy**	CSDT
1	Preferential policies of local investment is reasonable	CSDT1
2	Legal documents are be deployed quickly to investors	CSDT2
3	The tax system is clear	CSDT3
5	Administrative procedures simple, fast	CSDT4
V.	**Management factors and support of local government**	**CQDP**
1	Local leaders are willing to support investors	CQĐP1
2	Local government have a good support policies for investors	CQĐP2
3	Questions and feedback of enterprises are always answered satisfactorily	CQĐP3
4	Managers have good qualifications, skills and attitude of service	CQĐP4
VI.	**Advantages of the investment sector**	**LTDT**
1	Easy to approach with input factors	LTĐT1
2	Development of supporting industries	LTĐT2
3	Advantageous consumer markets	LTĐT3
4	Advantageous geographical location	LTĐT4
VII.	**The cost of using the infrastructure**	**CPHT**

1	Prices of communications services is reasonable	CPHT1
2	Electricity prices, water prices, freight rates are reasonable	CPHT2
3	A land lease prices is reasonable	CPHT3
4	Cost of waste disposal reasonable	CPHT4
VIII. The satisfaction level of investors		**MHL**
1	The industrial zone meets expectations	MHL1
2	Satisfied with the infrastructure system invested by the IZs	MHL2
3	Continuing to invest in the local industrial park	MHL3
4	Introducing the IZ in this locality to other investors	MHL4
5	Overall, Satisfied when investing in the industrial zone	MHL5

Source: *Compiled from the research results of the author*

3.2. Testing scale's quality

According to Nunally and Burnstein (1994) the scales and observed variables can be used if it satisfy: The Cronbach's Alpha coefficient of the overall scale is larger than or equal to 0.6 and the correlation coefficient of the sum of the observed variables in the scale must be larger than or equal to 0.3. The results of the scale test of the study meet the above conditions as follows:

Table 3: Testing scale quality

Group of factors	Cronbach's Alpha Coefficient
The satisfaction level of investors	α= 0,834
Investment in developing technical infrastructure	α= 0,758
Investment in developing social infrastructure	α= 0,753
Advantages of the investment sector	α = 0,774
Management factors and support of local government	α= 0,818
The cost of using the infrastructure	α= 0,865
Investment policy	α=0,833
Human resources	α= 0,838

Source: *Compiled from the research results of the author*

3.3. Analysis of discovery factors

After testing the quality of scale, the author removed the scale, the observed variable did not satisfy the condition and continued to analyze the discovery factor. According to Hair et.al (1998), EFA analysis is considered appropriate when the following conditions are satisfied: Multiplying the load factor Factor Loading> 0.55; 0.5 ≤ KMO ≤ 1; Bartlett's test has statistical significance Sig. <0.05; The variance method (Cumulative% of variance)> 50%. The results of exploratory analysis are as follows:

Table 4: Exploratory factor analysis

	Rotated Component Matrix[a]							
	Component							
	1	2	3	4	5	6	7	8
NNL1	,886							
NNL4	,855							
NNL2	,821							
NNL3	,796							
HTKT2		,904						
HTKT1		,787						
HTKT3		,761						
HTKT4		,572						
HTKT6								
LTDT2			,813					
LTDT4			,779					
LTDT3			,745					
LTDT1			,651					
CSDT3				,937				
CSDT4				,872				
CSDT1				,723				
CPHT4					,944			
CPHT2					,929			
CPHT3					,746			
HTXH3						,849		
HTXH2						,817		
HTXH4						,808		
HTXH1								
CQDP3							,881	
CQDP1							,838	
CQDP2							,792	
NNL6								,846
NNL5								,742

***Source**: Compiled from the research results of the author*

Results of KMO analysis = 0.653; Bartlett test has statistical significance Sig. = 0,000 <0.05 indicates that the observations are correlated in the overall with 99% significance level and the variance extracted is 73,435 indicating 73,435% variation of observed variables explained by 8 factors drawn. It can be concluded that EFA analysis is appropriate.

3.3.1. Regression results

Based on the results of scale test, there are 8 independent variables as above EFA analysis and 2 control variables are land lease area, labors scale,, the dependent variable of model is realized capital and investor satisfaction the author conducts regression analysis to estimate the impact level of factors.

3.3.1.1. Factors affecting the results of investment attraction in industrial zones

The results of investment attraction in industrial zones are measured by realized capital criteria. The general regression model is estimated as follows: VTH = β0 + β1DTT + β2LD + β3 NNLA + β4NNLB + β5CSDT + β6LTDT + β7CPHT + β8CQDP + β9HTXH + β10HTKT + ei

The results of regression analysis of variables in the model are presented in the table below.

Table 5: Regression results

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	VIF
		B	Std. Error	Beta			
1	(Constant)	-79,042	18,806		-4,203	,000	
	DTT	,154	,045	,224	3,456	,001	1,112
	LD	,030	,009	,213	3,405	,001	1,043
	NNLA	3,070	2,266	,095	1,355	,178	1,301
	NNLB	3,852	2,255	,117	1,708	,090	1,249
	CSDT	13,461	1,953	,466	6,892	,000	1,218
	LTDT	3,171	2,960	,070	1,071	,286	1,133
	CPHT	2,392	1,702	,088	1,405	,162	1,055
	CQDP	-,113	2,411	-,003	-,047	,963	1,107
	HTXH	1,101	2,707	,027	,407	,685	1,134
	HTKT	4,445	2,400	,119	1,852	,066	1.096
a. Dependent Variable: VTH							

***Source**: Compiled from the research results of the author*

R2 modify the model is 0.417 meaning that the independent variables of the model explain 41.7% of the variation of the dependent variable. The coefficient VIF also tells us that there is no multicollinearity phenomenon in the model. In the analysis table Anova variance shows: the F-value of the model with Sig level. = 0,000, thus it can be concluded that the model fit the actual data.

3.3.2 Factors affecting the level of satisfaction of investors in industrial zones

The general regression model with the dependent variable is the level of investor satisfaction estimated as follows: MHL = β0 + β1DTT + β2LD + β3 NNLA + β4NNLB + β5CSDT + β6LTDT + β7CPHT + C8CQDP + β9HTXH + β10HTKT + ei

The results of regression analysis of the variables in the model are as follows:

Table 6: Regression results

		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	VIF
		B	Std. Error	Beta			
1	(Constant)	,930	,420		2,213	,028	
	DTT	-,001	,001	-,043	-,615	,540	1,112
	LD	,000	,000	-,058	-,853	,395	1,043
	NNLA	-,052	,051	-,079	-1,036	,302	1,301
	NNLB	,037	,050	,055	,737	,463	1,249
	CSDT	,008	,044	,013	,177	,860	1,218
	LTDT	,164	,066	,177	2,478	,014	1,133
	CPHT	,029	,038	,053	,766	,445	1,055
	CQDP	,111	,054	,146	2,066	,041	1,107
	HTXH	,306	,060	,361	5,065	,000	1,134
	HTKT	,182	,054	,238	3,398	,001	1,096

***Source**: Compiled from the research results of the author*

Research Findings also included R2 of the model of 0.305, which means that the independent variables included in the model explain 30.5% of the variation of the dependent variable. The VIF coefficient also indicates that there is no multicollinearity phenomenon in the model. In the Anova variance analysis table: F statistics of the model with Sig level. = 0,000, it can be concluded that the given model is consistent with actual data

4. Conclusions and policy suggestions

4.1. Conclusion

Based on the relevant theoretical system, the study has developed a theoretical model consisting of 7 factors with 33 observed variables to analyze the factors affecting the results of investment attraction in the industrial zones and the satisfaction of investor industrial zones. After verifying

the scale's quality and analyzing the exploratory factor, the original model has been adjusted with 8 factors with 26 observed variables: investment in developing technical infrastructure of industrial zones, investment in social infrastructure development in industrial zones, investment policies, infrastructure use costs and advantage of investment industry, management labor.

After performing OLS regression, we see the level of impact on attracting and investment attraction in industrial zones is arranged from high to low sequentially as follows: investment policy (β = 13,461), investment in technical infrastructure development of industrial zones (β = 4,445), management labor (β = 3,852), land lease area (β = 0,154), and the labor size of the enterprise (β = 0.030).

Similarly, we also have group of investment in social infrastructure development is the most factor which impacted to the satisfaction of investors in the model with (β = 0.306), investment in technical infrastructure development is the second most factor impacted with (β = 0.182), in the research model (in which the advantage group of investment sector with (β = 0.164), management and support of local goverment with (β = 0.111)

4.2. Policy suggestions

According to analysis results, investment in technical infrastructure development in industrial zones has positive, therefore, improving the quality of investment and development of technical infrastructure of industrial zones to create a synchronous and modern infrastructure system and satisfaction of investors is very important. After the project comes into operation, the operation and management phase should also be strictly implemented so that the infrastructure system can maximize its capacity, best serving to the business investment activities of the investor.

Due to above issues, it is necessary to pay attention to all phases of investment activities from preparing investment to operating results of the investment in technical infrastructure development.

Research findings also show that investment in social infrastructure development in industrial zones is not statistically significant in the research model to the attraction results but it positively impacts investors' satisfaction. Thus, it is necessary to pay attention to the social infrastructure of industrial zones, which can enhance the coordination between the goverment and the infrastructure

investors of industrial zones to develop this content. Investment attraction policies have the strongest impact on the results of attracting investment in industrial zones.

Therefore, the management agencies focuses on completing policies to attract investment in production and business to create the best conditions for localities as well as infrastructure investors in attracting investment in industrial zones. Currently, industrial zones in the area are implemented by domestic investors. Binh Dinh province may consider in making policies to encourage foreign investors to contribute capital or make investment in infrastructure development industrial zones. Or allow a group of domestic and foreign investors to cooperate with each other to invest in developing infrastructure of industrial zones

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The Future of International Road Freight Transport Companies in Turkey: Challenges and Solutions

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Abstract

Road freight transport is not considered to be one of the largest transportation modes of our time, though it has continued to be one of the most important considerations of international trade throughout the history. Today, although the majority of international trade is known to be carried by sea transport, road freight transport is still of particular importance for our country. A relatively significant portion of our exports and imports has been carried out by road freight transport. Considering the last five years, 35% of our exports and 16% of our imports are realized through road freight transport. Despite these rates, road freight transport is expected to have a shrinking share due to the efforts to reduce its share over time because of both the high costs and harms it causes to the environment. On the other hand, considering the number of transportation vehicles, Turkey ranks 11th in the world, which signals that the country needs to produce new policies for road freight transport of goods. The aim of this study is to present the current situation of the companies in Turkey that carry out international road freight transport and the measures they take and are required to take and to suggest a prospective vision. For this purpose, the researcher carries out a situation analysis via face-to-face interviews with six logistics companies carrying international goods and develops alternatives solutions to the existing problems.

Keywords: International trade, logistics, road freight transport of goods

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1. Introduction

There are many suboperations in international trade logistics. In addition to storage, packaging, labeling, customs clearance of goods, and insurance, one of the most important issues undoubtedly is international transportation. Each of these processes closely affects the performance of the other. An error or a deficiency that may occur can easily affect the entire transportation system.

In addition to sea, rail, and air transport, road freight transport also creates a significant financial growth in many regions.

Increasing competition and crises as a result of globalization necessitate the reduction of profit margins and transportation in optimal time (Küçük, 2014,65). On the other hand service purchases, such as transportation, contain a considerable amount of detail according to the purchase of goods. Therefore, the margin of error increases (Cora, 2016, 9).

The road freight transport, which is quite ideal for the delivery of goods that are not transported too far and excessively high in tonnage and appears to be one of the frequently-used modes of transports in international trade, is the primary mode of transportation for the export and import operations in Turkey (Dölek, 2015, p.16).

While cheaper, safer, and faster modes of transportation have been developing and influencing the preferences of the industry, the road freight transport continues to be significant in Turkey as in many parts of the world. As of today, approximately 50% of our exports are carried out by road.

Nowadays, road freight transport is the most preferred mode of transportation since it is reliable. It is widely used and can make more cargo transported. All modes of transportation, e.g. moving a house or a factory, are realized via road freight transport. Road freight transport is the most commonly used modes of transportation for both the convenience and costs (www.webnak.com.tr). It is considered to be effective particularly in countries/regions where there are border trade and regional integration. In China, one of the most important agents in world trade, a significant correlation is observed between the quantity of the road freight transport of goods and the regional agreements. This development can be accounted not only for China but also for the European Union, which is considered to be the most important regional integration of the world.

The existence of practices that ensure the compatibility of the road freight transport with the other modes of transportation helps maintain the share of road freight transport. For example, while Ro-Ro transport makes the sea transport possible, road freight transport linked with rail transport systems is also increasing due to the increase in international integration.

Considering the particular case of Turkey, the fact that the destinations within a 40-hour transport period make up a significant portion (60%) of our exports can be a strong proof that road freight transport is indispensable. Therefore, it is important to demonstrate the pros and cons of road

freight transport with a good analysis and identify common policies. Accordingly, the following factors can be listed in order to sort out the pros of road freight transport.

- The most important advantage of road freight transport is that it allows the transportation of low amount of products in short and medium distances in a flexible and fast manner. Thus, it enables the companies that handle order-based work to make 'Just in Time' deliveries.
- Besides, the expected waiting time in the ports is bypassed thanks to the road freight transports, and the goods can directly be delivered to the customers' warehouses. The goods can be delivered to the buyers by road freight transport as safely as sea transports.
- There is usually very little need for terminals.
- It is the most convenient way to connect the whole production and consumption centers, that is, door-to-door transport.
- The transportation network is almost with no borders under appropriate geographical conditions.
- It provides fast service.
- It allows 24/7 loading/unloading/departing and provides convenience in loading and unloading.
- It makes searching and managing rental vehicles easy and allows frequent operations.
- It has relatively low handling costs and risk of damage.
- It is more efficient and economical in short distance.
- It has transportation capacities in very different volumes
- The transportation vehicle is under the control of the sender/carrier to a large extent.
- It enables to increase and decrease the speed of the transportation.
- It provides easy adjustment with departure and arrival times.

Despite the fact that road freight transport is cheaper compared to air transport and has the advantage of delivering the goods in a short time compared to sea transport, it has serious disadvantages especially in terms of cost and safety in some countries. Taking a close look at these disadvantages, the following factors are observed.

- The most important disadvantage of road freight transport is that it has higher transportation costs compared to other modes of transports.
- Fewer infrastructure investments compared to other modes
- Low amount of cargo transported at once
- Weight limitations
- Bad weather conditions
- Sensitive to the load balance of both ways
- Inadequate equipment at high volume deliveries
- Higher risk of an accident
- Environmental pollution, traffic density and occupying more inland, and infrastructure requirements
- Price uncertainty in market fluctuations

In addition to the disadvantages mentioned above, some significant risks emerging from the nature of international trade and the development of world trade await road freight transport. The fact that the world's major exporting/importing countries are in distant parts of the world makes sea transport advantageous. Today 95% of the world's trade is carried out by sea. However, due to the rapid developments in technology in the last 20 years, it is expected that road freight transport will make a competitive move parallel to the development in the world. In spite of these moves, there are some developments in the world trade processes that will put international road freight transport in a difficult position. It is important to take measures to ensure that our country's foreign trade is affected in the least way from these negative developments. For this purpose, the determination of the problems and risk factors encountered in international road freight transport is considered important for the success of the measures to be taken.

2. Threats for Road Freight Transport

Although road freight transport is not the most advantageous mode of transport in international trade, it has a significant place in Turkey's foreign trade. Turkey is one of the countries that have the largest transport fleet in Europe for the road freight transport of goods. Due to its location, it

is possible to reach the EU territory where the most important foreign trade partners are located by an average of 40 hours of road transport. On the other hand, Russia and the emerging markets of Europe that constitute the formerly independent states are close to us. The Middle East and Gulf countries which have taken a significant share in the field of international trade for the last 15 years are also within our reach by about the same hours of transport. For these reasons, the road freight transport of goods has been important for Turkey's foreign trade, and it appears to be that way for a while. In addition to all these developments, according to the information compiled from the National Energy Efficiency Action Plan (2016), it is planned to develop combined transportation applications in freight transport in order to ensure a balanced distribution between modes of transport.

On the other hand, the external costs of transportation are closely monitored by the European Union (Janic, 2007, 37). Moreover, it is aimed to increase the share of rail transport over 15 percent and the passenger transportation over 10 percent in order to increase the share of rail and sea transports and to move to corridor-based approach in transportation planning (www. Lojipark.com). Thus, the share of the road freight transport of goods is planned to be reduced from 90% to 60% by the end of 2023. This way, the share of other modes will increase. The aim is to reduce the fossil fuel consumption of motor vehicles and increase the share of the rail and sea transports by the city in the transportation of goods.

According to data from 2015, about 25 percent of Turkey's final energy consumption has been realized in the transportation industry. The fact that 91.6% of the energy consumption in transportation is realized by road freight transport brings about the necessity to reduce the share of road freight transport in modern transportation systems, which is clearly stated in all platforms by all relevant institutions and international organizations. The common position is to increase the penalties for many issues such as "the delivery time commitment between pickup and delivery point, responsibility for lost, damaged, and stolen goods, moving on an available route in compulsory conditions, and carrying the loads back" in international road freight transport. As a matter of the provisions of the convention, Turkey is a party to the CMR Convention; therefore, application of the provisions of the agreement is essential.

In general evaluation, in addition to current problems such as severe financial conditions, penalties, and bureaucratic restrictions in business processes, the biggest threats to the industry are discussed in the following six factors. These are;

1. Costs and pricing
2. Time factor and speed of delivery
3. Expansion of the distribution area
4. Sources of risk
5. Tonnage and quantity factor
6. Prohibitions and restrictions emerging from international agreements

In-depth interviews were conducted with five international transport companies that agreed to discuss how these six factors are perceived by the sector, and what kinds of negative developments are they experience in their businesses, and how to resolve them. As is known, the interview method is frequently used as a qualitative research method. In this study, it is concluded that the interview method is the most appropriate method to reach the results for the research. Steward and Cash (1985) describe this method as a mutual and interactive communication process based on asking and answering questions with a predetermined and serious purpose (as cited in Yıldırım and Şimşek, 2016, p.129). Interview method is an ideal method for uncovering the problems and opinions of the parties with a qualitative research especially on very different topics and topics with subtopics. When compared to other methods such as focus group interview, observation, or document review, the interview method discloses the problems of the sector and the perception of the sector representatives more clearly. For this reason, face-to-face interviews with sector representatives were planned and realized within the framework of a specific protocol. The researcher conducted the structured interview. Instead of a having a conversation, an interview form has been applied. The interview process allowed to maintain a flexible structure depending on the flow of the interview. This method also offers the possibility to elicit some answers that the sector representatives did not want to give away sooner with the help of further questioning. The distinctiveness of instant responses and in-depth discussion of some issues are also among the important advantages of the interview method. The main objective is to reveal the similarities and differences between the perceptions of the business managers interviewed, their perception of threats and the ways they perceive them, and their views on the solution. In doing so, it is holding a discussion on a predetermined subject. It is also presented to what extent the data from the interviews in the study agree with the literature.

3. Findings

In this study, five volunteer businesses that are based in Ankara and have branches in Ankara were interviewed. The interviews were conducted with each business with a predetermined 6-point interview protocol covering the points previously mentioned. As the names of the businesses are agreed to be kept confidential by both parties, the codes in the form of letters (A, B, C etc.) are used instead.

In the study, the answers are coded (+, ++, +++) and tabulated by preparing separate tables for each factor addressed. In the process of the tabulation, the researcher tried to classify and shorten the interview data obtained in the form of texts with + statements.

The meaning of +'s (pluses) in all tables given above and in the following parts is as follows.

+++ very, very important

++ very important

+ Important

Table 1. Finding related to cost and pricing

Cost and Pricing	Fuel	Motorways Tolls	Unfair Practices	Quato Costs	No Return Load
Company A	+++	+++	++	++	++
Company B	++	++	++	++	++
Company C	++	++	+	++	+
Company D	+	++	++	+	++
Company E	+++	+++	++	+	++

For cost and pricing factors, different countries, especially the EU trade is not sufficient because of the commercial quota for Turkey. The existence of these quotas hinders potential trade. However, the companies we interviewed stated that they were not disturbed by the existence of these quotas. This point was found interesting

When we think that the malitet items were taken in the following factors, it is seen that there are different factors in the study. It is aimed to ensure the flow of the logistics system from the production stage to the consumption phase.

The most important factors can be listed as follows:

Shipping type

Type of distribution operation

Installation planning

Route planning

Shipment includes not only movement from the supplier to the facility, but also from the warehouse to the customer. The cost of shipping is considered as the cost of distribution, regardless of which side (carrier or customer) is directly involved.

The cost-enhancing effect of the transport cannot be excluded. As the distance increases, the cost also increases, and as it opens out, appropriate logistics solutions must be available to maintain the competitiveness.

Changes in transport efficiency, improving the load factor (the amount of goods measured in tonnes, divided by vehicle capacity) by:

a. Optimizing the allocation of vehicles to shipments

b. Consolidating shipments originating from the same company

c. Consolidating shipments originating from several companies

d. Changing the number and location of depots, including consolidation and distribution centres e. Getting more return loads to reduce empty driving (Jong and Oth., 2010, 5).

Table 2. Finding related to time and speed

Time and Speed Factors	Transit Times in Customs	Quaility of Highways	Car Features	Remote Destination
Company A	+++	+	+	++
Company B	++	++	+	+++
Company C	+++	+	+	++
Company D	++	++	+	++
Company E	++	+	++	++

For time and speed factor, athough in the literature factors such as highway quality and vehicle characteristics are mentioned, enterprises state that the quality of motorways is not a significant factor. Vehicle features, however, did not present a disadvantage for Turkish businesses. Ouality of Highways includes roads, floors, tunnels, overpasses and overpasses and signs (Görçün, 2010,3).

Table 3. Finding related to width of services area

Width of Services Area	Exporters in Far Regions	Road Transport Agreements in Remote Areas	Additional Costs of Remote Regions	The Choice of Highways in Remote Areas to be	No Transit Route
Company A	+++	+++	+++	+++	++
Company B	++	+++	++	+++	++
Company C	+++	+++	+++	++	++
Company D	++	+++	+++	+++	+++
Company E	++	+++	+++	+++	++

For the width of the service area, the limitation of transit transitions was not considered to be an important factor in contrast to the literature. Remote delivery points were not seen as a threat to road transport.

Effect of the same set of factors may vary significantly depending on the country or a particular area. For example, heavy snowfall may not cause long delays in areas where it is a usually occurring phenomenon as there are enough snow removal machines and most drivers are used to this type of weather conditions. On the other hand, even light snowfall may stop all traffic in regions that usually do not have snow at all. Also, the time of reaction of emergency services in case of some problems on roads may differ depending on the country (Sigakova, 2012,7).

Table 4. Finding related to sources of risks

Sources of Risks	Thefts	Surprise Driver Visa Barriers	Driver Unavailability	Acciedent
Company A	+	+	++	+
Company B	+	++	++	+
Company C	++	+	++	+
Company D	+	++	+++	+
Company E	+	+	+++	+

Risk is defined as uncertainly of situation or event which can negatively affect the performance of organization, or event that has a few probability to happen but can harm the organization both in short term and long term sustainability. The risks and theft risks foreseen by the literature within the risk sources factor are not considered as risk factors for Turkish enterprises.

The absence of drivers and the prolongation of total carriage times are other factors that have emerged in another study (Hanssen ve others, 2012, 193).

Table 5. Finding related to tonnage and Quantity

Tonnage and Quantity Factors	Tonnage	Kinds of Products
Company A	+++	+++
Company B	++	+++
Company C	+++	++
Company D	++	+++
Company E	++	++

The nature and quantity of the product to be transported in foreign trade is an important factor for the selection of the transport mode. This sector can be closely monitored.

Table 6. Finding related to international Agreements Applications

International Agreements Applications	Decrease in Traceability	Requesting Multiple Documents	Data Input Obligations	Trade Barriers
Company A	++	+++	+++	++
Company B	++	+++	++	+
Company C	++	++	+++	++
Company D	++	+++	++	++
Company E	++	+++	+++	++

The traceability of transport vehicles in international regions is not seen as a threat to enterprises. In the recent period, the existence of important software and technological developments have eliminated this problem.

Concern has been mounting over the environmental impact of freight transport operations. Although tightening vehicle emission standards have been reducing exhaust emissions of noxious gasses, such as nitrogen oxides, hydrocarbons, carbon monoxide and particulate matter, attention has shifted to the growth in carbon dioxide (CO_2) emissions from the freight sector.

National governments and the EU have set targets for reducing all these emissions and devised policy measures to cut the external costs of freight transport (Piecky & McKinnon, 2010,31).

4. Conclusions

In the scope of the study, interviews were held with the managers holding different positions in the five businesses that carry international goods. As a result of the findings obtained from the interviews, the researcher has reached the following results.

1. Among the existing problems, the businesses participating in the interview emphasize six factors as the most important problems that threaten the sector. These six factors that this study also focuses on appear to be the ones mentioned above.

Costs and pricing

Time factor and speed of delivery

Expansion of the distribution area

Sources of risk

Tonnage and quantity factor

Prohibitions and restrictions emerging from international agreements

However, as a result of the interviews, it is observed that there are sub-factors that bring about these 6 factors, and each sub-factor is evaluated separately.

2. The constant increase in fuel prices and tolls are notable, particularly among the cost factor. Another important point is the absence of a load on the way back. 72% of the Turkish transport vehicles exporting goods cannot find loads to be delivered to Turkey or a different location. The ratio of foreign carriers in Turkey's imports tend to rise. This ratio was 31% in 2016 and went up to 35% in 2017. Especially Bulgarian, Iranian and Romanian carriers are noteworthy for this increase.

Another important disadvantage of the road transport is the expansion of the distribution area. Apart from our trade with the European Union, the Middle East or Russia and the Other Baltic States, the fact that Turkey does not have road transport agreements with more distant areas or multilateral agreements with these countries brings about crucial problems. The presence of transit restriction between Turkey and the EU and that these problems are not to be solved reduce

the foreign trade approximately 3.5 billion euros single-handedly. 1.9 billion dollars of this amount can be added to Turkey's foreign trade as exports (www.ulasimonline.com). These distant geographies increase the risk factors as well as the costs. However, the most important problem is that the transporters do not prefer road freight transport after a certain distance.

4. The most important risk factors of road freight transport are discussed under two components. The most important risk factor is stated to be that it is becoming more and more challenging for employers to find good drivers. Drivers, on the other hand, express that due to low wages and the difficulty of working conditions, finding drivers will become even more important in the short time.

5. Another threat that was found out about is the shift of large quantities of deliveries in tonnage to the other modes of transport. Excluding air transport, especially sea transport and rail transport that has recently been promoted with international projects (e.g. one belt, one road) pose difficulties for road transport. The fact that some types of goods are not convenient to be carried out by the road transport makes this mode confined to certain sectors only.

6. Another important threat is the practices emerging from international agreements. Turkey is a party to international and multilateral agreements, and there is an increase in the number and types of documents in foreign trade for road freight transport. The increase in the number of documents in the last 10-year period is around 50%.In 2006, the transportations needed 39 documents, and today the number increased to 58 (www.kargohaber.com). In addition, electronic data entries, which are also applicable in our country, are requested by different countries nowadays. Providing and monitoring the data correctly is extra workload on the carriers and a mistake, in this case, would cause delays and higher costs.

As a result, the share of road freight transport of goods within total transportation tends to decrease in parallel to the developments in the world. This decrease is slightly less than the average for Turkey. Therefore, road freight transport is more important for Turkey than in other countries. Furthermore, a large part of the problems mentioned above are the ones that can be eliminated by multilateral agreements. The resolution of these problems can be realized by taking macro measures on the basis of countries and not businesses and by making the new agreements. In this case, road freight transport of goods appears to have a higher risk perception than other modes of transport.

The development of road freight transport of goods will undoubtedly follow up with the increase in our export. The increase in innovative products with high value-added will also bring up other

transportation modes over time. In addition to the exploratory results obtained from this qualitative research, the prospective studies can be carried out on the basis of the sector as well as the territories to transport.

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