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THE JOURNAL OF CORPORATE GOVERNANCE, INSURANCE AND RISK MANAGEMENT

This Journal replaces the former European Journal of Economics and Management (EJEM) first launched in 2014. The Journal is an international open-access refereed indexed journal, published twice Annually.

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Model of Using the Exhaustive Search Algorithm in Solving of Traveling Salesman Problem (TSP) on the Example of the Transport Network Optimization of Primorje-Gorski Kotar County (PGC)

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ABSTRACT

This paper considers and presents a model of the use of an exhaustive search algorithm in solving problems of a salesman on the example of the transportation network optimization of Primorsko Goranska County. By identifying the suboptimal solutions of transportation network, that enable insight into more transportation routes and can be significantly influenced by the reduction of transportation costs and creating increased opportunities for the carrier in the context of flexible designing the structure of the commodity flows, greater utilization of transport capacity, and thus achieve greater profit. In the analyzed example, transportation network of Primorje-Gorski Kotar County (PGC) is divided into two sets (segment): 1) a set of cities (nodes) that are located (placed) on the same traffic direction (transportation route) that represents the optimal transportation route, and 2) a set of cities (nodes) that connect through a variety of transport relationships and that are included in the calculation by using the exhaustive search algorithm. In the example are also defined nodes that are common to both the two sets and that are connecting by the virtual transportation route in the spreadsheet optimization model.

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1. INTRODUCTION

Due to the large increases in the number of cities in the world, mobility between cities has become difficult because of there existing many dissimilar roads to reach the same city with different travelling cost (Ameen, Sleit and Al-Sharaeh, 2018.), where there are several places that are all directly connected to each other by different long roads and the passenger wants to make the shortest trip. Some algorithms can be used to guide people using one of the transport or movement methods (walking, train, car, and bus) to reach their destination on the shortest route. (Zhan and Noon, 1996).

The paper presents the use of Travelling Salesman Problem (TSP) model and a Exhaustive Search Algorithm on the example of the transport network of Urban agglomeration Rijeka. The flexibility and adaptability of transport networks can be achieved by optimizing the routes of movement of vehicles between one of the sources and multiple destinations in transport network. The most important operational decision related to optimizing transport network of Urban agglomeration Rijeka can be set the analogy according to that the number of calculated suboptimal solution. The basic criterion for selection of optimal transport relation is the distance between cities (trade transport centers). In cases of the same or similar distance, there is a possibility of dynamic selection of multiple transport relations for different periods of time, so, from the perspective of other relevant criteria, there can be one optimal relation for a certain period of time, and another optimal relation for other periods. The majority of existing software solutions allows calculation and insight into one optimal solution. Using visual and object methods in programming and modelling to form an algorithm of detailed search criteria can simulate models with more than one optimal solution for small scale patterns, with clear interpretation of the results, not only those in optimal value, but also those of approximately equal values and their deviation from the optimum. Finding a large number of optimal transport relations allows greater flexibility in making a multiobjective selection of optimal transport relation, especially over different periods of time (Vukmirović and Pupavac, 2013.).

2. METHODOLOGY

2.1. Materials and Methods

Methodological frame of use of Visual Basic as a development tool in the visual modelling of Exhaustive Search Algorithm in VBA for Excel can serve as an incentive in creating new highly sophisticated algorithms, which will enable us to compute optimal and suboptimal solutions of transport network (Vukmirović, Čičin-Šain and Host, 2015). In accordance with the problem of research is set the research hypothesis: The use of the exhaustive search algorithm in finding the suboptimal solutions, significantly affects on the transport network optimization, so that allows a reduction in transport and logistics transport cost and time, but also more flexible designing structure of the transport network, the greater utilization of transport capacity, thereby creating added value and achieve greater profits The paper is composed of six parts.

In the first part of this paper Introduction, the features of this work are presented. In the second part Traveling Salesman Problem Determinants there are considered theoretical background and determinants of Traveling Salesman Problem and Exhaustive Search Algorithm in the context of transport network optimization. In the third part The conceptual model of transportation network optimization on the example of Primorje-Gorski Kotar County (PGC), transport network is divided into two sets (segment): 1) a set of cities (nodes) that connect through a variety of transport

relationships and that are included in the calculation of suboptimal solutions by using the exhaustive search algorithm and 2) a set of cities (nodes) that are located (placed) on the same traffic direction (transportation route). In the fourth part The method of exhaustive search algorithm in finding suboptimal solutions of transportation network, there are considered and presented the use and meaning of an exhaustive search algorithm, based on visual and object oriented methods of modeling and programming, in finding and visualization of suboptimal solutions on the level of choosing set of nodes (transport network segment). In the fifth part, The importance of the suboptimal solution of the transport problem on the example of PGC, there are considered and analyzed the effects of the suboptimal solutions. In the sixth part Conclusion, the synthesis of the whole work was presented and the most important results of the research were presented.

3. RESULTS

3.1. Traveling Salesman Problem Determinants

The Travelling Salesman Problem (TSP) is an optimization problem used to find the shortest path to travel through the given number of cities. Travelling salesman problem states that given a number of cities N and the distance between the cities, the traveler has to travel through all the given cities exactly once and return to the same city from where he started and also the length of the path is minimized (Rao, A., Hegde, S. K., 2015).

The Travelling Salesman Problem (TSP) can be formulated as follows: to choose a pathway optimal by the given criterion. In this, optimality criterion is usually the minimal distance between towns or minimal travel expenses. Travelling salesman should visit a certain number of towns and return to the place of departure, so that they visit each town only once (Heizer & Render, 2004). The travelling salesman problem can be classified as Symmetric Travelling Salesman Problem (STSP), and Asymmetric Travelling Salesman Problem (ATSP). In STSP the distance between two cities is same in both the directions. In ATSP the distance between two cities is not same in both directions (Rao, A., Hegde, S. K., 2015).

The Travelling Salesman Problem (TSP) is one of the most studied problems in management science. Optimal approaches to solving Travelling Salesman Problems are based on mathematical programming. But in reality, most TSP problems are not solved optimally. When the problem is so large that an optimal solution is impossible to obtain, or when approximate solutions are good enough, heuristics are applied. Two commonly used heuristics for the Travelling Salesman Problem are the nearest neighbour procedure and the Clark and Wright savings heuristic (Heizer & Render, 2004).

In terms of combinatorial optimization, the Travelling Salesman Problem (TSP) can be formulated in the following way: Given a list of n cities C and distance d_{ij} from city i to city j ; TSP, is

to find the best possible way of visiting all the cities by visiting each city only once finding minimum total travel distance. In analogy to the above definition, the following formulations are valid: 1) Travel distance or distance between cities is symmetric: $d_{ij} = d_{ji}$ (1) or asymmetric $d_{ij} \neq d_{ji}$ (2); 2) Final list of cities is defined as incoming variable by the formula $C = (c_1 \dots c_n)$, while distance matrix containing distance between city c_i and city c_j for each pair i, j is defined by $d(c_i, c_j)$; 3) Permutations or in other words all permuted relations that can be achieved for a given number of cities are computed as resulting variables. Permutations $p(1), \dots, p(n)$ in the list $1, \dots, n$ are calculated and compared to give the minimum sum (Abdoun, O., Abouchabaka, J., Tajani, C., 2012), (Vukmirović, Pupovac, 2013).

Exhaustive search algorithm, also known as brute force search, is a very general problem-solving technique. In the Travelling Salesman Problem (TSP), every tour corresponds to a permutation of the cities. In a permutation problem every feasible solution can be specified as a total ordering of an underlying ground set (Fomin, F.V., Kratsch, D., 2010). The Exhaustive Search Algorithm enumerating all possible candidates for the solution (permutations) and checking whether each candidate satisfies the problem's statement. It is considered as approach to apply and is useful for solving small-size instances of a problem.

Table 1 reveals the exponential (factorial) growth of number of possible solutions in relation to the number of nodes in a logistics network. That Table realistically captures the travelling salesman problem complexity. *3.1. Subsection*

Table 1: Number of solutions with n cities

Number of nodes (cities)	Number of solutions (STSP)	Number of solutions (ATSP)
3	1	2
4	3	6
5	12	24
6	60	120
7	360	720
8	2520	5040
9	20160	40320
10	181440	362880
15	43.589.145.600	87.178.290
20	6,082E+16	12,164E+16

Source: Abdoun, O., Abouchabaka, J., Tajani, C., 2012.

3.1.1. The conceptual model of transport network optimization on the example of PrimorjeGorski Kotar County (PGC)

A transportation network allows supplying of logistics centres of towns and cities, and municipalities, their subsystems and all logistics entities in Rijeka Urban Agglomeration. A key factor in designing an efficient transportation network to create an efficient system for goods distribution is the use of relevant information-communication technologies (ICT) and computer applications to determine optimal routing between the nodes (cities, municipalities, distribution centres, ports, terminals) as well as route planning. Table 2 shows distances between 17 cities and municipalities of PGC which had been determined by using Google Maps technology, a web mapping service developed by Google.

Table 2. Distances between cities and municipalities of PGC

No	City	Abb	Distances																
			0	22	12	7	14	12	9	11	9	18	27	46	86	12	21	28	15
1	Rijeka	RI	0	22	12	7	14	12	9	11	9	18	27	46	86	12	21	28	15
2	Kraljevica	KC	22	0	9	14	37	33	31	32	17	40	10	28	68	13	49	57	31
3	Bakar	BA	12	9	0	9	27	23	20	22	9	29	18	40	79	5	39	47	15
4	Kostrena	KO	7	14	9	0	22	26	23	24	12	32	23	42	81	7	35	43	18
5	Opatija	OP	14	37	27	22	0	4	12	7	22	20	41	60	75	26	7	14	28
6	Matulji	MA	12	33	23	26	4	0	8	3	19	15	38	57	79	22	11	19	25
7	Viškovo	VI	9	31	20	23	12	8	0	5	16	10	34	53	87	19	19	26	11
8	Kastav	KA	11	32	22	24	7	3	5	0	18	13	36	55	82	21	14	22	14
9	Čavle	ČA	9	17	9	12	22	19	16	18	0	22	29	48	87	4	30	37	6
10	Klana	KL	18	40	29	32	20	15	10	13	22	0	44	63	97	27	29	36	16
11	Omišalj	OM	27	10	18	23	41	38	34	36	29	44	0	25	59	20	47	55	35
12	Krk	KR	46	28	40	42	60	57	53	55	48	63	25	0	33	39	65	74	54
13	Cres	CR	86	68	79	81	75	79	87	82	87	97	59	33	0	79	70	48	82
14	Kukuljanovo	KU	12	13	5	7	26	22	19	21	4	27	20	39	79	0	32	40	10
15	Lovran	LO	21	49	39	35	7	11	19	14	30	29	47	65	70	32	0	10	43
16	Mošćenička Draga	MO	28	57	47	43	14	19	26	22	37	36	55	74	48	40	10	0	50
17	Jelenje	JE	15	31	15	18	28	25	11	14	6	16	35	54	82	10	43	50	0
			RI	KC	BA	KO	OP	MA	VI	KA	ČA	KL	OM	KR	CR	KU	LO	MO	JE

The value of optimal transport relation has been calculated by usage of programming language for mathematical modeling Xpress (Figure 1).

Figure 1: The value of optimal transport relation calculated by usage of program Xpress

```

examples - FICO® Xpress Workbench
tourpgz2.mos - x
Run Command: tourpgz2.mos
Mon Mar 11 2019 20:49:08 GMT+0100 (Central European Standard Time)
FICO Xpress Mose1 32-bit v4.8.4
(c) Copyright Fair Isaac Corporation 2001-2019. All rights reserved
Compiling tourpgz2.mos with -g
Optimal solution found

Its      Obj Value      S  Ninf  Nneg  Sum Dual Inf  Time
52      214.000000    D   0    0    .000000  0
Dual solved problem
52 simplex iterations in 0s
Running model
(1.364s) Total distance: 214
Kastav - Viskovo - Klana - Jelenje - Cavle - Rijeka - Kostrena - Kukuljanovo - Bakar -
Kraljevica - Omissalj - Krk - Cres - Moscenicka - Lovran - Opatija - Matulji - Kastav

```

Source: Author

The conceptual model of transportation network optimization of Primorje-Gorski Kotar County (PGC), has designed in the function of finding the suboptimal solutions. On the map 1 is a graphical display of the optimal transport route and the conceptual model of the transportation network of PGC. In accordance with this concept transport network is divided into two sets (segment): 1) a set of cities (nodes) that connect through a variety of transport relationships and that are included in the calculation of suboptimal solutions by using the exhaustive search algorithm and 2) a set of cities (nodes) that are located (placed) on the same traffic direction (transportation route).

In the example are also defined nodes that are common to both the two sets (Kastav ad Bakar) and that are connecting by the virtual transportation route in the spreadsheet optimization model. In the table in map 1 are listed the names of cities and the abbreviations, and in the right part is shown of the value of the optimal solutions and configurations (direction) of the optimal transport route. With the optimal solution, on the map 1. are shown the possible suboptimal solutions og transport network. In the upper part of the map is a graphical selected set of cities (nodes) that connect through a variety of transport relationships and that are included in the calculation of suboptimal solutions. Arrows indicate connections between cities (nodes) in the transport network, where the solid line indicates the optimum transportation route, and dashed line indicate the possible suboptimal transport routes.

Figure 2: The conceptual model of transport network optimization of PGC



Source: Author

3.1.2. The method of exhaustive search algorithm in finding suboptimal solutions of transportation network

In the transport network optimization of PGC, Exhaustive Search Algorithm built in Visual Basic has been used. Object-oriented programming in Visual Basic has been used to build and visualize Exhaustive Search Algorithm to calculate one or multiple optimal transportation routes. Cities included in the calculation of the transportation network belong to the set of nodes S1 that is explained in the previous chapter and shown on map 1.

Table 3 contains travelling salesman problem (TSP) results in the given example. The results have been calculated by program Visual Basic in Excel spreadsheet interface (VBA for Excel), created by the authors of this work. It can be seen from the Table 3, that 40,320 possible transport routes (relations) have been computed with the minimum route length having 65 km.

Table 3: Solution of transport network in program Visual Basic for Excel

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
1	8	7	10	17	9	1	4	14	3	65	0	12	9	20	0	9	29	5	15	3	BA	
2	3	14	4	1	9	17	10	7	8	65	12	0	7	9	11	9	18	12	15	1	RI	
3	3	1	4	14	9	17	10	7	8	67	9	7	0	23	24	12	32	7	18	4	KO	
4	8	7	10	17	9	14	4	1	3	67	20	9	23	0	5	16	10	19	11	7	VI	
5	8	10	7	17	9	1	4	14	3	68	0	11	24	5	0	18	13	21	14	8	KA	
6	3	14	4	1	9	17	7	10	8	68	9	9	12	16	18	0	22	4	6	9	ČA	
7	8	7	10	17	9	14	1	4	3	69	29	18	32	10	13	22	0	27	16	10	KL	
8	3	4	1	14	9	17	10	7	8	69	5	12	7	19	21	4	27	0	10	14	KU	
9	3	1	4	14	9	17	7	10	8	70	15	15	18	11	14	6	16	10	0	17	JE	
10	8	7	10	17	14	9	1	4	3	70	3	1	4	7	8	9	10	14	17			
11	8	10	7	17	9	14	4	1	3	70	BA	RI	KO	VI	KA	ČA	KL	KU	JE			
12	3	4	1	9	14	17	10	7	8	70												
13	8	10	7	1	4	14	9	17	3	71	Optimal transport relation											
14	8	10	7	1	4	14	17	9	3	71	KA	VI	KL	JE	ČA	RI	KO	KU	BA			
15	3	17	9	14	4	1	7	10	8	71	8	7	10	17	9	1	4	14	3			
16	3	9	17	14	4	1	7	10	8	71	5	+10	+16	+6	+9	+7	+7	+5				= 65
17	8	1	7	10	17	9	14	4	3	72												
18	8	10	7	17	9	14	1	4	3	72	Suboptimal transport relation											
19	8	10	7	1	4	17	9	14	3	72	KA	VI	KL	JE	ČA	KU	KO	RI	BA			
20	8	10	7	1	4	9	17	14	3	72	8	7	10	17	9	14	4	1	3			
21	8	7	10	1	4	14	17	9	3	72	5	+10	+16	+6	+4	+7	+7	+12				= 67
22	8	7	10	1	4	14	9	17	3	72												
40319	3	10	4	17	1	14	8	9	7	181												
40320	3	10	4	17	1	9	8	14	7	181												

Source: Authors

Table 4 reveals the suboptimal transportation routes having values within an acceptable tolerance of 3% as compared to the best optimal value, or minimum route length as calculated. In Table 4 in the column No the same ordinal numbers indicate the relations that are symmetrical. From the table it is seen that the relation No 1 is optimal, and the other relations (from 2 to 10) are suboptimal relations.

Table 4: Optimal and suboptimal transportation routes

No.	Optimal and suboptimal transport routes																		S1+S2	Length	Tol.		
	Set of Nodes - S1									Set of Nodes - S2													
1	8	7	10	17	9	1	4	14	3	3	2	11	12	13	16	15	5	6	8	65	149	214	0%
	KA	VI	KL	JE	ČA	RI	KO	KU	BA	BA	KC	OM	KR	CR	MO	LO	OP	MA	KA				
2	8	7	10	17	9	14	4	1	3	3	2	11	12	13	16	15	5	6	8	67	149	216	1%
	KA	VI	KL	JE	ČA	KU	KO	RI	BA	BA	KC	OM	KR	CR	MO	LO	OP	MA	KA				
3	8	10	7	17	9	1	4	14	3	3	2	11	12	13	16	15	5	6	8	68	149	217	1%
	KA	KL	VI	JE	ČA	RI	KO	KU	BA	BA	KC	OM	KR	CR	MO	LO	OP	MA	KA				
4	8	7	10	17	9	14	1	4	3	3	2	11	12	13	16	15	5	6	8	69	149	218	2%
	KA	VI	KL	JE	ČA	KU	RI	KO	BA	BA	KC	OM	KR	CR	MO	LO	OP	MA	KA				
5	8	7	10	17	14	9	1	4	3	3	2	11	12	13	16	15	5	6	8	70	149	219	2%
	KA	VI	KL	JE	KU	ČA	RI	KO	BA	BA	KC	OM	KR	CR	MO	LO	OP	MA	KA				
6	8	10	7	17	9	14	4	1	3	3	2	11	12	13	16	15	5	6	8	70	149	219	2%
	KA	KL	VI	JE	ČA	KU	KO	RI	BA	BA	KC	OM	KR	CR	MO	LO	OP	MA	KA				
7	8	10	7	1	4	14	9	17	3	3	2	11	12	13	16	15	5	6	8	71	149	220	3%
	KA	KL	VI	RI	KO	KU	ČA	JE	BA	BA	KC	OM	KR	CR	MO	LO	OP	MA	KA				
8	8	10	7	1	4	14	17	9	3	3	2	11	12	13	16	15	5	6	8	71	149	220	3%
	KA	KL	VI	RI	KO	KU	JE	ČA	BA	BA	KC	OM	KR	CR	MO	LO	OP	MA	KA				
9	8	1	7	10	17	9	14	4	3	3	2	11	12	13	16	15	5	6	8	72	149	221	3%
	KA	RI	VI	KL	JE	ČA	KU	KO	BA	BA	KC	OM	KR	CR	MO	LO	OP	MA	KA				
10	8	10	7	17	9	14	1	4	3	3	2	11	12	13	16	15	5	6	8	72	149	221	3%
	KA	KL	VI	JE	ČA	KU	RI	KO	BA	BA	KC	OM	KR	CR	MO	LO	OP	MA	KA				

Source: Authors

By comparison of optimal solution generated by exhaustive search algorithm, shown in table 4. (the line No 1, the column Length) and optimal solution generated by program for mathematical modelling Xpress (Figure 1), we can see that the results match.

3.1.3. The importance of the suboptimal solution of the transport problem on the example of PGC

The reader should understand the differences between optimal and suboptimal solutions and when one is required or more desirable than the other. If the problem is not continuous, as in a job-shop where persons are assigned to do different jobs on a job to job basis, a suboptimal solution is perhaps more desirable because it can be obtained much more cheaply and quickly. At this point, it should be noted that anyone can obtain a suboptimal solution. The Traveling Salesman Problem (TSP) is a problem which requires an optimal solution, especially if the route is to be used several times. In general, if the solution is to be applied only once, a suboptimal solution will be adequate and a very close to optimal solution may be even more desirable than the optimal solution (Gregory, 1970).

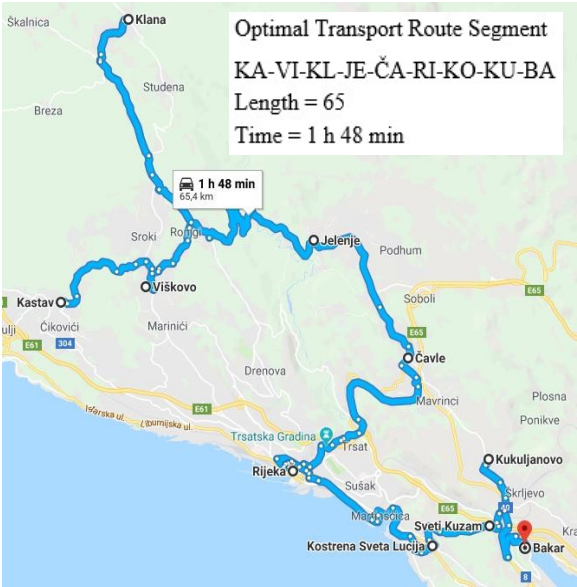
Sequential insertion with possible requests for variable quotes to all trucks and to all routes potentially produces suboptimal solutions (Greenwood. 2009.)

In the described example of the transport network optimization of PGZ, the criterion (factor) of optimization is the minimum length of the transport relation. Considering the more optimal solutions within a given deviation interval, it is possible to parse and analyze the synergy of all relevant factors that determine the best (optimal) or set of best solutions.

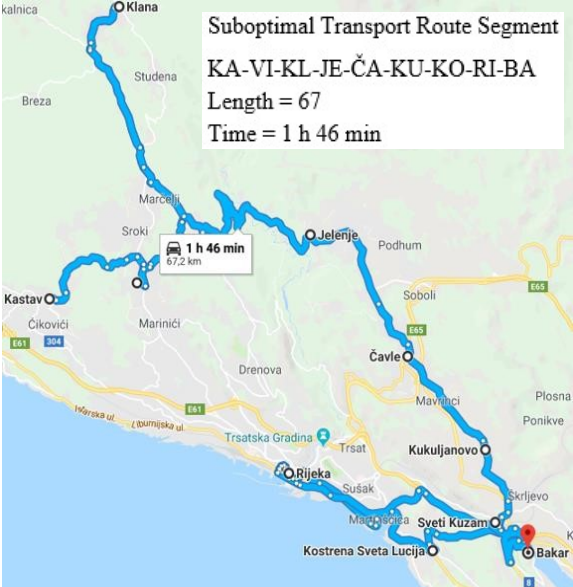
By comparing the optimal solution to map 2 and the suboptimal solution to the map 3. can be seen the change of order of cities (nodes) in the transport network segment (S1) of PGC. Map 2 is the graphical display of the optimal transportation route (No. 1 in Table 4) having the minimal length. Map 3 is the graphical display of the suboptimal transportation route No. 2 in Table 4 of PGC. The suboptimal solution to Map 3 corresponds to the solution under No. 2 shown in Table 4.

In the upper-right part of the map 2. and map 3. there are display the transport routes, the values of the length of the transportation routes and estimated time of drive. Side-by-side analysis of the above values can be seen that from the position of the length of the relationship, the most favorable is the first relation shown in map 2. Estimated time from the position of driving, the more favourable it is conveying the relationships shown in map 3.

Map 2. Optimal transport route



Map 3. Suboptimal transport route



Significance of suboptimal solutions to the transportation problem of Rijeka Urban Agglomeration is illustrated by a hypothetical example as shown in Table 5. The example shows the following parameters: Total Transport Capacity (TTC), Reserved Transport Capacity (RTC), Free

Transport Capacity (FTC), Loading Cargo Units (Inputs), Fixed Quote of Loading (Input1), Variable Quote of Loading (Input2) and Load Capacity Utilization (LCU).

Table 5: Comparison of two transportation routes and suboptimal solution on the example of Urban agglomeration Rijeka

	<u>Route 1</u>		<u>Route 2</u>
	Destination 1	Origin	Destination 2
	Rijeka ←	Čavle →	Kukuljanovo
TTC	2000	2000	2000
RTC	1400	1000	1800
FTC	600	1000	200
LCU	70%		<u>90%</u>
Input 1	400		400
Input 2	0		400
Input	400		800

Source: Authors

The table shows a comparison of the two transportation routes: Route 1 (Čavle - Rijeka) and Route 2 (Čavle – Kukuljanovo). Scheme 1 reveals that Route 1 is the optimal solution of the total transportation route of PGC, while Scheme 2 suggests that Route 2 is a suboptimal solution. In the example, as shown in Table 1, Load Capacity Utilization (LCU) is analyzed. The origin is Čavle, and potential destinations are Rijeka (Route 1) and Kukuljanovo (Route 2). The data in the origin column (Čavle) are values for TTC, RTC, and FTC, whereas the data in the destination columns (1 and 2) are values of the fixed and variable quotes of loadings, transported along Route 1 and Route 2.

The table reveals that the fixed quotes of loadings (Input1) that are loaded at the origin (Čavle) are equal for both routes. The variable quotes are different, with the quote for Route 1 (Čavle - Rijeka) being equal to 0, and the quote for Route 2 (Čavle - Kukuljanovo) is 400. Choosing Route 2 increases the load capacity utilization (LCU). The table shows that the value of LCU on Route 1 equals 70%, and LCU on Route 2 is equal to 90%.

4. CONCLUSIONS AND IMPLICATIONS

4.1. Discussion and conclusion

The paper considered the use of the exhaustive search algorithm, in identifying and finding the optimal and suboptimal solutions of the transportation network on the example of PGC. Authors should discuss the results and how they can be interpreted in perspective of previous studies and of the working hypotheses. The findings and their implications should be discussed in the broadest context possible. Future research directions may also be highlighted. The method of exhaustive search algorithm based on visual and object oriented methods of modeling and programming, enables

calculating the suboptimal solutions with clear visualization and interpretation not only for the optimal value of transport network, but approximately equal value (suboptimal values) and their deviations from the optimal value. It has been proved that the use of the exhaustive search algorithm in finding the suboptimal solutions, significantly effects on the transport network optimization, so that allows a reduction in transport and logistics transport cost and time, but also more flexible designing structure of the transport network, the greater utilization of transport capacity, thereby creating added value and achieve greater profits, which confirmed the research hypothesis.

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Competency Profile of Project Team Members – Interplay with Team Dynamics and Project Success

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ABSTRACT

In contemporary business environment, in which learning and knowledge are considered as the only sustainable competitive advantage of modern organizations, and there is a trend of growing reliance on project type of teams' and organizations' functioning, competencies of project team members are becoming more important than ever. By integrating competencies of fundamental managerial functions and competencies of project management's knowledge areas, this paper investigates the nature of competency profile of project team members, as well as its main effects on project. Established competency profile of project team members is analyzed in relation to project team dynamics and project success. The mediating role of project team dynamics in the effect of competency profile of project team members on project success also investigated in the paper. Cross-sectoral empirical research was conducted during the spring of 2018, through which data from 83 project team members was collected via questionnaire. Collected data was enrolled and processed in SPSS 23.0, with addition of Hayes' (2018) PROCESS Macro for SPSS - v3.2. Results obtained through descriptive, bivariate and multivariate analyses led to very interesting insights and inferences, especially when considering the cluster analysis' and mediation effects' results related to the interplay of project team members' competency profile, project team dynamics and project success.

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1. INTRODUCTION

In contemporary business environment there is a trend of growing reliance on project type of teams' and organizations' functioning. According to Lindgren and Packendorff (2006: 842), projects and project-based work are perceived as a way of avoiding inherent problems and pitfalls of bureaucracy and are part of the new wave of new 'post-bureaucratic' organizational forms that has entered most industries during the last decades. In this sense, Pinto, Dawood and Pinto (2014: 578) emphasize that, although project managers and their teams face complex, highly demanding and often-stressful work environments, project-based work grows in popularity, especially in promoting organizational output, initiating critical change and penetrating into industries that were traditionally

bureaucratic in nature. Projects and project-based work offer large opportunity for achieving competitive advantage and/or adding value to the company, as long as they are organized and managed properly on all levels (strategical, tactical and operational) (Poli, Cosić and Lalić, 2010: 29). Consequently, Crawford (2005: 7) emphasizes that there is increasing interest in the competence of project managers and specialized project management staff as more organizations adopt project management approaches and the demand for project managers and project management staff grows.

Turner (1990 in Turner and Müller, 2003: 1) defines project as *'an endeavour in which human, material and financial resources are organized in a novel way, to undertake a unique scope of work, of given specification, within constraints of cost and time, so as to achieve beneficial change defined by quantitative and qualitative objectives'*. From this definition, it is obvious that project-based work represents set of numerous and various challenges, dealing with whom demands from project specialists (project managers, project team members, consultants,...) effective combination of adequate knowledge, methodical expertise, experience and leadership behavior. Synergy of just mentioned elements leads to personal competence of project management staff, which in turn, through its positive effect on project performance, leads to higher organizational performance (Crawford, 2005: 8). In this sense, the key factors for project/project management to be successful are commitment to complete the project, appointment of a skilled project manager, adequate definition of the project, correctly planning the activities in the project, adequate information flow, accommodation of frequent changes, rewarding the employees, being open to innovations and the environment in which the project takes place (Munns and Bjeirmi, 1996 in Isik et al., 2009: 629).

In order for formulated project goals to be achieved, apart from project management staff's competencies, numerous other preconditions and factors need to be aligned and adjusted. As mentioned in previous section, the environment in which project takes place, especially project team dynamics plays key role. Interpersonal dynamics of project teams are often critical factors for a team to function effectively (Buffinton, Jablow and Martin, 2002: 25). The emergence and constant flow of learning activities, such as intuiting, interpreting, integrating and institutionalizing (Crossan, Lane and White, 1999: 525), as well as usage of knowledge, methods and leadership behavior, heavily depends on team dynamics. If favorable, team dynamics will enable and stimulate project team members to (1) acquire a detailed knowledge of task at hand, (2) communicate effectively at the interpersonal and organizational level, and doing so resolve or mitigate conflict and (3) be able to construct problem solving solutions (Sommerwille and Dalziel, 1998: 169). Consequently, different bundles of characteristics of project team dynamics will be strong predictors or drive project cost, schedule and operability, as emphasized by Scott-Young and Samson, following their comprehensive research on the role of project team factors in project success (2008: 749).

Clearly, competency profile of project team members and project team dynamics play significant or even crucial for project success. Although their effects on project success are discussed in detailed in relevant literature, the interplay between competency profile of project team members and project

team dynamics, especially in the light of project success, is far less investigated. Therefore, Sommerwille and Dalziel (1998: 165) emphasize that opposite to the considerable amount of work in the field of creating project teams, observing how they function and monitoring their performance, little is known of how people behave in project teams, what criteria measures project team success or what actually makes a good project team. Therefore, the goal of this paper is to shed further light on the effects of competency profile of project team members and project team dynamics on project success and especially on the interrelationship between these two constructs and their joint effect on project success. In order to achieve just stated goals, research presented in this paper will try to answer on following, main research questions:

- *What is the nature of effect of competency profile of project team members on project success?*
- *What is the nature of effect of project team dynamics on project success?*
- *Does project team dynamics play mediation role in the effect of competency profile of project team members on project success, and what is the nature of this role?*

2. THEORETICAL FOUNDATIONS

2.1. Project team

Project team is a mixture of roles, authorities and responsibilities, ultimately responsible for successful managing and execution of project. Project team, depending on the size of the project and characteristics of organizational structure of parent organization, will have more or less differentiated roles and number of members and will resemble more or less to functional, matrix or pure project organization form. Namely, project team can take one of the following organizational forms: simple structure (small projects, e.g. organizing events), machine bureaucracy (bureaucratic project, e.g. construction), professional bureaucracy (professional project, e.g. new project development), divisionalized form (multi-project organization/programmes, e.g. management consultants) and adhocracy (adhocracy projects, e.g. large innovative projects) (van Donk and Molloy, 2008: 135). In these organizational forms, apart from project manager, who solely plays all the roles of project team in small projects, project team in large projects can include number of 'assistant managers' and other individuals who can help project manager to effectively manage and execute project (Meredith et al., 2014: 58). In this sense, role and positions on project and in project team such as project board, project sponsor, project owner, project director, project manager, team leader, project consultant, project team member, and project team specialist are among most common ones.

2.2. Competency profile of project team members

Project-based work is a synonym for dynamic and stressful work environment, clear time and budget constraints, multitude of leadership and management challenges and methodological expertise.

No matter how many engineers, administrators, field managers, etc., project team, and every team, according to Belbin (2010), needs to have 9 fundamental role: plant, coordinator, monitor/evaluator, implementer, completer/finisher, resource investigator, shaper, team worker and specialist. In this sense, Buble (2010: 20-22), besides acknowledging the importance of Belbin team roles in effective project team functioning, emphasizes that project team members can play several different roles simultaneously and that all listed roles can be generally divided to team roles and executive/implementing roles. Further, Meredith et al., (2014: 58) state that project team members need to be technically competent, politically sensitive, have strong goal orientation and have high self-esteem. More concretely, A guide to the project management body of knowledge (PMBOK Guide, 2017) lists 10 fundamental project management knowledge areas: project integration management, project scope management, project schedule management, project cost management, project quality management, project resource management, project communications management, project risk management, project procurement management and project stakeholder management. These knowledge areas are supported and even supplemented with other competencies related to fundamental management functions such as planning, organizing, staffing, directing/leading and controlling.

2.3. Project team dynamics

According to the Gelbard and Carmeli (2009: 465), project team dynamics, which refers to the quality and quantity of interactions among project team members, largely determines the success of the project. Team cohesion, efficacy, problem solving, resolving conflicts, communication, mutual support, collaboration, displayed leadership behaviors, etc., are among most important aspects of project team dynamics. Furthermore, project team dynamics and consequential performance is under of heavy influence of organizational context, project team design, leadership and processes (Scott-Young and Samson, 2008: 753) and fluctuates depending on the developmental stage of forming in which specific project team is (Sommerwille and Dalziel, 1998: 165). In this sense, number of researches, such as Allen et al., (1988) have shown that project team' performance and dynamics changes as they age, e.g. project team's performance declines after certain period of steady increase, project teams tend to isolate themselves from technical knowledge and prefer more narrower, specialized work as they age, etc. Difficult to predict, measure, design or manage, project team dynamics remains one of the main project manager's challenges in performing his/hers job.

2.4. Project success

Project success come in various forms (qualitative and quantitative) and time horizons. Nogeste and Walker (2005: 55) suggest that traditional 'iron triangle' of project success or outcomes (time, cost and quality of project outputs) needs to be supplemented with 'value-add' project success or outcomes. Having in mind that ultimate goal of every project to be successful, Shernhar (1996 in Poli

et al., 2010: 33) differentiates 4 broad project success dimensions: 1) efficiency (short-term success dimension), 2) impact on the customers (mid-term success dimension) and 3) impact on the business and 4) building for the future (long-term success dimensions), within which he proposes around 20 concrete success measures. Similarly, Kath et al., after analyzing project success criteria in past 40 years, have developed model which contains 5 project success criteria dimensions: project efficiency (iron triangle), organizational benefits, project impact, stakeholder satisfaction and future potential (Joslin and Müller, 2016: 615). In this sense, but more concretely, Kerzner (2009: 7) proposed 7 main areas of project success: within the allocated time period, within the budgeted cost, at the proper performance or specification level, with acceptance by the customer/user, with minimum or mutually agreed upon scope changes, without disturbing the main work flow of the organization, without changing the corporate culture.

3. RESEARCH MODEL AND METHODOLOGY

To provide answers to previously listed research goals, research model was developed (Figure 1). As shown in the research model, the effects of competency profile of project team members on projects success will be investigated, as well as mediating role, which project team dynamics plays/does not play in mentioned effects.

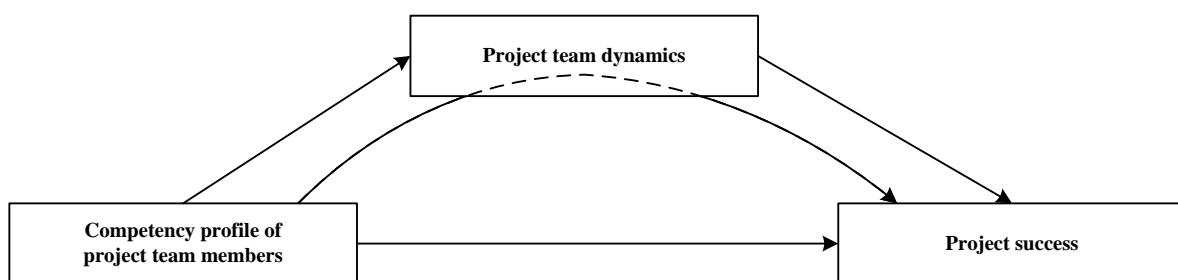


Figure 1. Research model

In order to provide insights and answers to the main research questions posed in the paper, empirical research was conducted during the spring of 2018. As a research instrument, specially developed questionnaire was used. Questionnaire, which contained 42 predominantly 5 point Likert scale questions, was structured in four main areas, namely: (1) general characteristics related to respondent and respondent's company, (2) successfulness of achieving project goals, (3) dynamics of group functioning and (4) competencies related to project-based work. Theoretical foundations, discussed in previous chapter, served as a basis for questionnaire development. Collected data was enrolled and processed in SPSS 23.0. Descriptive (univariate) and inferential (bivariate and multivariate) statistics were conducted in order to provide answers to posted research questions. Concretely, measures of central tendency and dispersion, regression tests and cluster analysis were employed.

Previously identified as project team members, 83 respondents from companies from various industries participated in the empirical research. General characteristics of respondents as well as respondents' companies, i.e. sample characteristics are shown on Figure 2. From Figure 2 it is visible that 9 different industries were represented in the research sample. As expected, largest number of respondents comes from industries of engineering and construction (25.3%) and manufacturing (26.6%), as these are industries in which project type of work and conducting business activities is present the most. Three quarters of respondents (75.9%) work in privately owned companies. Researched companies conduct projects predominantly on frequent or constant basis (68.7%), while only few companies conduct project very rarely (6.0%).

Almost half of the respondents have project management related graduate study programme diploma (48.2%), followed by respondents with undergraduate study programme diploma (25.3%)

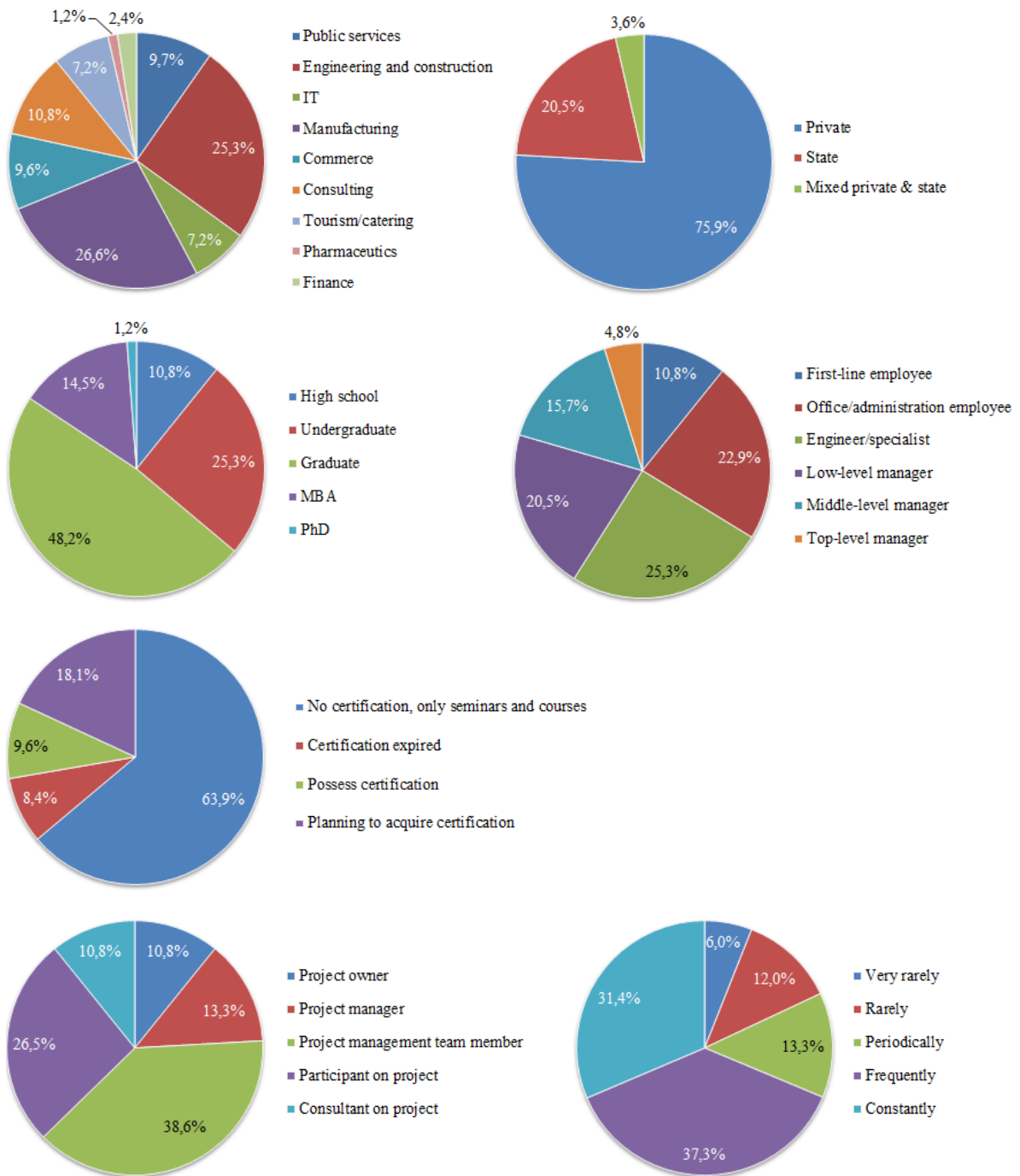


Figure 2. Research sample characteristics

and MBA diploma (14.5%). From these respondents, large majority does not possess PMI or IPMA or some other similar certification, but were attending various project management related courses and seminars. Only small portion of respondents do possess mentioned certification (9.6%), while nearly 1/5 of them are planning to acquire such certification in future. Having all this in mind, respondents are distributed, according to their qualification and competencies, on all types of jobs in their companies, from first-line employees to top-level management positions. In this sense, office/administration employees (22.9%), engineers/specialists (25.3%) and low-level managers

(20.5%) are dominant in the research sample, which is expected having in mind just described nature of respondents' qualifications. As for the work on projects, respondents are predominantly participating (26.5%) or are members of project management team (38.6%). Nearly 1/3 of them have perform tasks and duties on projects which demand from them significantly higher level of project management knowledge, competencies and experience, such as project owner, project manager and consultant on project (34.9%).




Just described respondents' and respondents' companies characteristics offer valid basis to conclude that research sample has good representativeness, as far as project-based work is concerned. Therefore, the results and conclusions presented in following text and paper overall have their validness and legitimacy due to the adequate research sample representativeness.

4. FINDINGS

4.1. Descriptive statistics

Results obtained from conducted empirical research through descriptive and inferential statistics offer very interesting insights and inferences. Descriptive statistics for three research constructs, i.e. competency profile of project team members, project team dynamics and project success, are shown in Table 1.

Table 1. Descriptive statistics for competency profile of project team members, project team dynamics and project success



As for the competency profile of project team members, total of 17 competencies, related to project management knowledge areas and fundamental management functions, were investigated. Mean value for competency profile of project team members of 3.71, on the scale from 1 to 5, with standard deviation of 0.89, suggests that project team members possess medium to high level of competencies related to project-based work. In this sense, there are competencies which are on quite high level and stand-out, such as competencies related to project IT (4.00), procurement (4.04), quality (3.99) and system thinking (3.94). On the other hand, seeing thing from other perspective (3.30), handling project cost (3.59) and dealing with project risks (3.53) are the areas in which project team members do not feel that much comfortable. Improving just emphasized questionable competencies' areas would lead to more favorable competency profile of project team members and project team members' preparedness for project-based work's challenges.

Project team dynamics, compared with discussed competency profile of project team members, is much better and is on high level ($mean=3.89$; $SD=0.80$). Results suggest that project team dynamics is characterized with very strong goal orientation of project team members (4.40) and highly efficient decision-making (3.99). Ways in which conflict is resolved in project team (3.61) and closely related project team members' perception of own actions and effects of these actions (3.71) are on the lowest level of all investigated aspects of project team dynamics.

Successfulness of the projects on which respondents were engaged, with their competencies and present project team dynamics, was on high level ($mean=4.01$; $SD=0.70$). Differences in the project successfulness from one criterion to another are pretty small. The most successful aspect of the projects is their impact on customers (4.25), followed by closely related criteria of projects' output quality (4.19). The aspects in which projects were the least successful, but still on high level, are those oriented on future, i.e. project team learning/development and organizational benefits related to knowledge and experience gained which can be useful for future projects. The aspect of project costs is also something that demands additional attention by project team members.

4.2. Model testing

In order to provide answers to research question, research model was tested by means of inferential statistics. In this sense, the results of linear regression analyses, testing direct and indirect/mediation effect of one research construct onto another, conducted via *PROCESS macro* (Hayes, 2018), are presented Figure 3 and Appendix A. Presented results clearly indicate that competency profile of project team members has statistically significant effect ($p < .01$) on project team dynamics and project success. From the two, the effects on project team dynamics is stronger ($b = .57$, $R^2 = .40$ vs. $b = .39$, $R^2 = .58$). Project team dynamics also has statistically significant effect on project success and this effect is not as strong ($b = .30$, $R^2 = .58$, $p = < .01$) as the effect of competency profile of project team members on projects success. Considering the mediating role of project team dynamics in the effect of competency profile of project team members on project success, results of direct effect and indirect effects show that there is a statistically significant, positive mediation effect of project

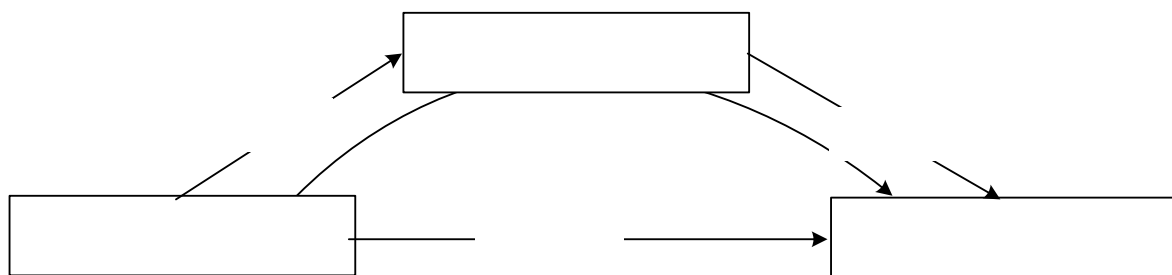


Figure 3. The interplay between competency profile of project team members and project team dynamics and their effects on project success

team dynamics. Namely, when comparing total and direct effects of competency profile of project team members on project success, there is a difference in contribution (b) and this difference or indirect effect of competency profile of project team members on project success, through project team dynamic, is statistically significant ($b = .56$ vs. $b = .39 \Rightarrow b = .17$, $BootLLCI = .0579$, $BootULCI = .2623$). These results indicate that project team dynamics additionally boosts the positive effect of competency profile of project team members on project success.

With the aim of shedding further light into the interplay between competency profile of project team members and project team dynamics and their effects on project success, tested with research model, a K-means cluster analysis was conducted. Classifying the research sample into 2 clusters on the basis of project-based work' competencies of project team members and testing the research model separately for every cluster will provide additional insight into mentioned interplay between research constructs. In this sense, Table 2 shown the results of cluster analysis. Cluster 1 contains 30 project team members with significantly lower competency profile, compared with cluster 2, which contains 53 project team members with higher competency profile.

Table 2. K-means cluster analysis of the research sample based on project-based work' competencies of project team members



The results of testing the research model, driven by conducted cluster analysis results, are shown on Figure 4 and Appendixes B and C. Interestingly, when project team members have lower competency profile, that profile does not effect project team dynamics ($p = .49$), while the effect of project team dynamics on project success is somewhat questionable ($b = .27, p = .06$) in these circumstances. Even if it is on lower levels, competency profile of project team members effects project success, but only directly ($b = .37, p = .03$), while total effect is slightly lower and questionable due to the non-existence of indirect effect of project team dynamics ($b = -.04, BootLLCI = -.1859, BootULCI = .0709$). In other words, in the situation when project team members poses lower competency profile, project team dynamics if not influenced by that competency profile and does not play significant, i.e. mediating role in the effect of competency profile of project team members on project success. As for the situation in which project team members possess high level of project-based work's competencies, here the results are similar to initial model testing, but effects are magnified. All effects are much stronger compared to initial model testing and especially compared to the situation in there is a lower level of competency profile of project team members. This leads to conclusion that project team dynamics plays significant or boosting role in the positive effect of competency profile of project team members on project success only when mentioned competency profile is on higher levels.

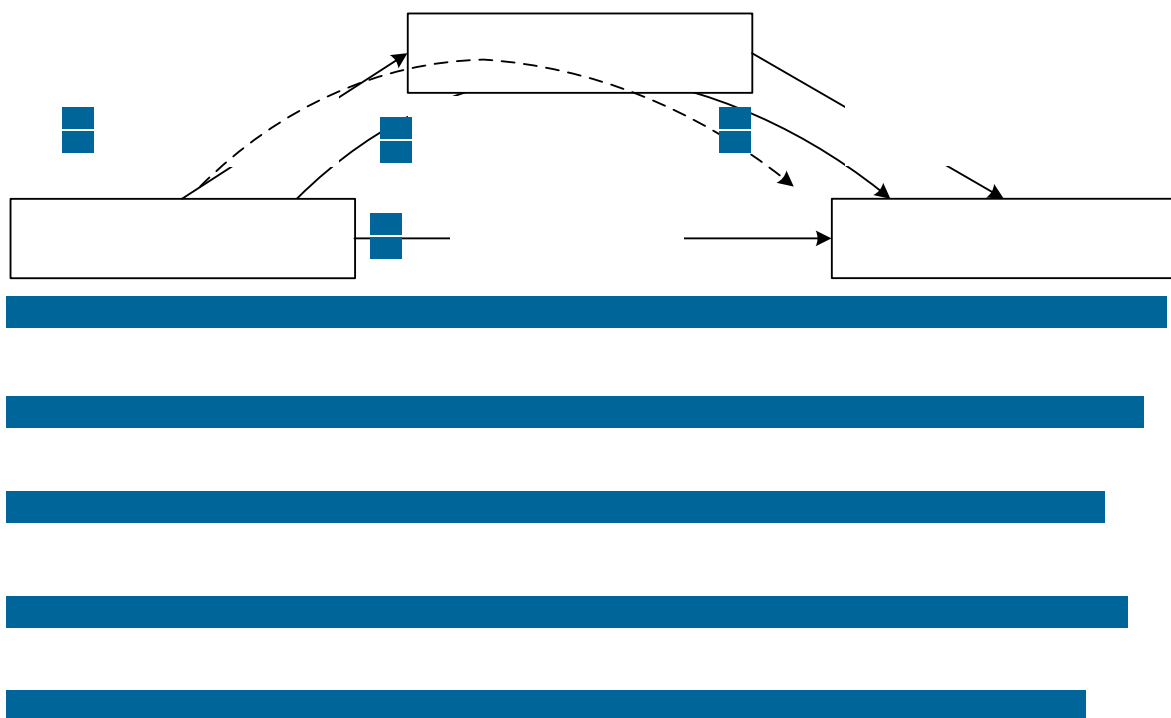


Figure 4. The interplay between competency profile of project team members and project team dynamics and their effects on project success (clusters 1 and 2)

5. CONCLUSIONS

Today, project-based work is increasingly being implemented in order to conduct business activities in more responsible, goal oriented, time and cost limited, quality driven and expectations of customers' and stakeholders' led manner. Competencies of project-based work are becoming even more important in contemporary business environment, having in mind the crucial role and major impact which competencies of project management personnel have on project performance/success and therefore business performance (Crawford, 2005: 7). Adding to that the widely adopted stand that learning and knowledge can be the only sustainable competitive advantage in 21st century, the nature and the level of competencies of project team members is direction within project management field, which demands further and stronger research emphasis.

Empirical research in this paper has answered three main research question posted in the paper. Competency profile of project team members plays significant role in achieving desired project performance and outcome levels and ultimately ensuring project success. While positively effecting the project success, competency profile of project team members also positively effects project team dynamics and through project team dynamics also additionally, indirectly positively effects project success. Although indirect positive effect of competency profile of project team members, through project team dynamics, on project success is significantly lower compared to the size of its direct effect, the great potential and role of mentioned indirect effect, i.e. interplay between competency profile of project team members and project team dynamics in achieving project success, must not be neglected in any way. In this sense, cluster analysis driven additional testing of paper's research model showed that the role of project team dynamics in the relationship between competency profile of project team members and project success is heavily magnified when the levels of competencies of project team members are on higher or high level. To exploit the mediating positive or boosting role of project team dynamics in achieving project success, low and modest levels of project-based work' competencies of project team members are something that needs to be avoided by all means by person(s) responsible for structuring and forming project team.

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Appendix A - Results of model testing - PROCESS procedure for SPSS (Hayes, 2018) (N=83)

***** PROCESS Procedure for SPSS Version 3.00 *****

 Model : 4
 Y : GOALS
 X : COMP
 M : DYNAMIC

Sample
 Size: 83

 OUTCOME VARIABLE:
 DYNAMIC

Model Summary

	R	R-sq	MSE	F	df1	df2	p
	,6305	,3975	,3963	53,4326	1,0000	81,0000	,0000

Model

	coeff	se	t	p	LLCI	ULCI
constant	1,7700	,2977	5,9449	,0000	1,1776	2,3625
COMP	,5706	,0781	7,3098	,0000	,4153	,7259

 OUTCOME VARIABLE:
 GOALS

Model Summary

	R	R-sq	MSE	F	df1	df2	p
	,7616	,5800	,2095	55,2327	2,0000	80,0000	,0000

Model

	coeff	se	t	p	LLCI	ULCI
constant	1,4101	,2595	5,4350	,0000	,8938	1,9265
COMP	,3877	,0731	5,3025	,0000	,2422	,5332
DYNAMIC	,2990	,0808	3,7010	,0004	,1382	,4598

***** TOTAL EFFECT MODEL *****
 OUTCOME VARIABLE:
 GOALS

Model Summary

	R	R-sq	MSE	F	df1	df2	p
	,7128	,5081	,2423	83,6547	1,0000	81,0000	,0000

Model

	coeff	se	t	p	LLCI	ULCI
constant	1,9394	,2328	8,3292	,0000	1,4761	2,4026
COMP	,5583	,0610	9,1463	,0000	,4369	,6798

***** TOTAL, DIRECT, AND INDIRECT EFFECTS OF X ON Y *****

Total effect of X on Y

Effect	se	t	p	LLCI	ULCI	c_ps	c_cs
,5583	,0610	9,1463	,0000	,4369	,6798	,8004	,7128

Direct effect of X on Y

Effect	se	t	p	LLCI	ULCI	c'_ps	c'_cs
,3877	,0731	5,3025	,0000	,2422	,5332	,5558	,4950

Indirect effect(s) of X on Y:

Effect	BootSE	BootLLCI	BootULCI	
DYNAMIC	,1706	,0516	,0549	,2656

Partially standardized indirect effect(s) of X on Y:

Effect	BootSE	BootLLCI	BootULCI	
DYNAMIC	,2446	,0783	,0790	,3965

Completely standardized indirect effect(s) of X on Y:

Effect	BootSE	BootLLCI	BootULCI	
DYNAMIC	,2178	,0673	,0663	,3399

***** ANALYSIS NOTES AND ERRORS *****

Level of confidence for all confidence intervals in output:
 95,0000

Number of bootstrap samples for percentile bootstrap confidence intervals:
 5000

----- END MATRIX -----

Appendix B - Results of model testing - PROCESS procedure for SPSS (C1; N=30)

***** PROCESS Procedure for SPSS Version 3.00 *****

Written by Andrew F. Hayes, Ph.D. www.afhayes.com
 Documentation available in Hayes (2018). www.guilford.com/p/hayes3

 Model : 4
 Y : GOALS
 X : COMP
 M : DYNAMIC

Sample
 Size: 30

 OUTCOME VARIABLE:
 DYNAMIC

Model Summary							
	R	R-sq	MSE	F	df1	df2	p
	,1298	,0169	,5266	,4801	1,0000	28,0000	,4941

Model						
	coeff	se	t	p	LLCI	ULCI
constant	3,6282	,6085	5,9624	,0000	2,3817	4,8747
COMP	-,1488	,2148	-,6929	,4941	-,5889	,2912

 OUTCOME VARIABLE:
 GOALS

Model Summary							
	R	R-sq	MSE	F	df1	df2	p
	,4890	,2391	,2728	4,2423	2,0000	27,0000	,0250

Model						
	coeff	se	t	p	LLCI	ULCI
constant	1,5919	,6599	2,4124	,0229	,2379	2,9458
COMP	,3692	,1559	2,3673	,0253	,0492	,6891
DYNAMIC	,2707	,1360	1,9902	,0568	-,0084	,5498

***** TOTAL EFFECT MODEL *****
 OUTCOME VARIABLE:
 GOALS

Model Summary							
	R	R-sq	MSE	F	df1	df2	p
	,3570	,1275	,3017	4,0909	1,0000	28,0000	,0528

Model						
	coeff	se	t	p	LLCI	ULCI
constant	2,5741	,4606	5,5889	,0000	1,6306	3,5176
COMP	,3289	,1626	2,0226	,0528	-,0042	,6619

***** TOTAL, DIRECT, AND INDIRECT EFFECTS OF X ON Y *****

Total effect of X on Y								
	Effect	se	t	p	LLCI	ULCI	c_ps	c_cs
	,3289	,1626	2,0226	,0528	-,0042	,6619	,5692	,3570

Direct effect of X on Y								
	Effect	se	t	p	LLCI	ULCI	c'_ps	c'_cs
	,3692	,1559	2,3673	,0253	,0492	,6891	,6389	,4008

Indirect effect(s) of X on Y:				
	Effect	BootSE	BootLLCI	BootULCI
DYNAMIC	-,0403	,0650	-,1859	,0709

Partially standardized indirect effect(s) of X on Y:				
	Effect	BootSE	BootLLCI	BootULCI
DYNAMIC	-,0697	,1182	-,3359	,1311

Completely standardized indirect effect(s) of X on Y:				
	Effect	BootSE	BootLLCI	BootULCI
DYNAMIC	-,0437	,0751	-,2280	,0640

***** ANALYSIS NOTES AND ERRORS *****

Level of confidence for all confidence intervals in output:
 95,0000

Number of bootstrap samples for percentile bootstrap confidence intervals:
 5000

----- END MATRIX -----

Appendix C - Results of model testing - PROCESS procedure for SPSS (C2; N=53)

***** PROCESS Procedure for SPSS Version 3.00 *****

Written by Andrew F. Hayes, Ph.D. www.afhayes.com
 Documentation available in Hayes (2018). www.guilford.com/p/hayes3

Model : 4
 Y : GOALS
 X : COMP
 M : DYNAMIC

Sample
 Size: 53

OUTCOME VARIABLE:
 DYNAMIC

Model Summary

R	R-sq	MSE	F	df1	df2	p
,6393	,4087	,1989	35,2445	1,0000	51,0000	,0000

Model

	coeff	se	t	p	LLCI	ULCI
constant	,9695	,5587	1,7351	,0888	-,1523	2,0912
COMP	,7766	,1308	5,9367	,0000	,5140	1,0393

OUTCOME VARIABLE:
 GOALS

Model Summary

R	R-sq	MSE	F	df1	df2	p
,6898	,4759	,1797	22,6983	2,0000	50,0000	,0000

Model

	coeff	se	t	p	LLCI	ULCI
constant	,6733	,5465	1,2320	,2237	-,4244	1,7710
COMP	,5415	,1617	3,3488	,0015	,2167	,8663
DYNAMIC	,3135	,1331	2,3552	,0225	,0461	,5808

***** TOTAL EFFECT MODEL *****

OUTCOME VARIABLE:
 GOALS

Model Summary

R	R-sq	MSE	F	df1	df2	p
,6463	,4177	,1957	36,5878	1,0000	51,0000	,0000

Model

	coeff	se	t	p	LLCI	ULCI
constant	,9772	,5542	1,7631	,0839	-,1355	2,0899
COMP	,7849	,1298	6,0488	,0000	,5244	1,0455

***** TOTAL, DIRECT, AND INDIRECT EFFECTS OF X ON Y *****

Total effect of X on Y

Effect	se	t	p	LLCI	ULCI	c_ps	c_cs
,7849	,1298	6,0488	,0000	,5244	1,0455	1,3670	,6463

Direct effect of X on Y

Effect	se	t	p	LLCI	ULCI	c'_ps	c'_cs
,5415	,1617	3,3488	,0015	,2167	,8663	,9430	,4459

Indirect effect(s) of X on Y:

Effect	BootSE	BootLLCI	BootULCI
DYNAMIC	,2434	,1173	,0408

Partially standardized indirect effect(s) of X on Y:

Effect	BootSE	BootLLCI	BootULCI
DYNAMIC	,4240	,1886	,0764

Completely standardized indirect effect(s) of X on Y:

Effect	BootSE	BootLLCI	BootULCI
DYNAMIC	,2005	,0904	,0356

***** ANALYSIS NOTES AND ERRORS *****

Level of confidence for all confidence intervals in output:
 95,0000

Number of bootstrap samples for percentile bootstrap confidence intervals:
 5000

----- END MATRIX -----

Contribution to the methodology for determining the competitiveness of a domestic product (on example of geotextile)

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ABSTRACT

The idea of this paper is to align the business decision-making process with detected product competitiveness characteristics of the domestic company on the domestic market. For this paper was designed "proposal of the operational steps of a simple market and product research methodology", for the existing product in the existing market. These operational steps should be a small contribution for the development of rules and procedures for managing marketing functions in business activities. According to literature, for this paper available and explored, there is a room to research the impact of such procedures and rules in order to increase the selling efficiency of products in terms of detected market circumstances and comparative advantages. Therefore, an indicative question was set down for this paper: "How much domestic product is competitive on the domestic market?" Through an example of geotextile, the competitiveness of domestic products was investigated in compare with foreign products by determining certain characteristics that affect purchasing decisions. An analysis of the Croatian geotextile market was conducted, competitive products were compared and consumer preferences were explored when deciding on purchases. The research results indicate the necessity of applying, even simple, product and market research methodologies. Namely, the analysis of the results showed that the qualitative competitiveness of domestic products in relation to the foreign products is not satisfactory, the price is not the most important deciding factor and the domestic origin of the product as a decision making factor is not important.

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1. INTRODUCTION

The marketing concept is intentionally conceived as a systematic approach to free market, and business policy management in function of set business goals based on concept of marketing. A large part of business processes should lean on the concept of marketing. On the other hand, the phenomenon of globalization has indicate to the significant linkage between the various and the most distant national economies. (Giddens 1999, Weizsäcker 1999, Altvater 2005, Desai 2006). „The 2007-08 financial crisis affected many countries simultaneously and led to a global economic crisis unseen since the Great Depression.“ (Huwart, Verdier, 2013:126). The global crisis, also called the "Great Recession" that affected the world with uneven intensity, did not have the same effects, and did not

last the same, in all countries. But this same crisis has also highlighted the need to protect national economies, as far as possible within the framework of open market economies.

This opinion can be confirmed by other researches, for example, where some evidence point out „the role of globalized banks in transmitting financial stresses to the real economy during the global financial crisis ... non-resident creditors was transmitted domestically through a significant reduction in bank credit supply. Resident subsidiaries and branches of foreign-owned banks reduced lending by a larger amount than domestically-owned banks“ (Shekhar, 2012:225). This observation is referring to crisis conditions, when all business entities, including ones in financial sector, operate very cautiously in their business. Can particular countries, and in what way, create the conditions for continuous development of entire national economy based on various measures and protective policies?

Whatever the answer it is, this is not the question of this paper. However, in terms of global business and competition, for every business entity is extremely important how it plans and sets its business operations. The effects/impacts of global processes can be an opportunity, but for unprepared business entities, it can be a great threat. For this reason, the advantages and disadvantages of the products and services of particular companies derive from the approach to business operations i.e. do they use basic management functions and marketing concept in business. So, the question of this paper is how much market research (simple procedure to determine product competitiveness and consumer preference) can be helpful for companies? The assumption is that determination of the comparative characteristics of the product and the preference of consumers on the market (in this case on geotextile example) should influence business decisions. In this regard, a "proposal of the operational steps of a simple market and product research methodology" has been devised for this paper for an existing product in the existing market. This should be a contribution to the development of a simple market research methodology i.e. to contribute to the establishment of rules and procedures for business operations based on marketing management. The company's business success stems from the quantity and quality of the application of basic management and marketing principles, as well as the carefully thoughtful marketing performance on domestic and/or foreign markets. Obviously, the role of marketing approach is necessary. Although often mentioned, the concept of marketing as a business concept and business function is not sufficiently applied, is not applied adequately, or is not in use at all in the Republic of Croatia. These facts were also pointed out by the study "Strategic determinants of the development of textile and clothing industry in Croatia for the period 2006 to 2015" (Teodorović, et al., 2007) and the Industrial Strategy of the Republic of Croatia 2014-2020 (MINGO RH, 2014). For the development of company competitiveness are necessary "greater investment in research and development, marketing, own brand and sales distribution network development", says the strategy (MINGO RH, 2007: 154). A serious marketing concept implies a coherent business

policy. Therefore, business entities need to focus on a marketing concept that is not only about promotional activities, but also about conceptual planning and development of the overall business.

The question "How much domestic product is competitive on the domestic market?" points to many problems that faced underdeveloped, but still open, economies such as Croatia - primarily to protect their own production and product competitiveness from the aspect of quality, price, delivery, availability, etc. Sometimes we wonder is the perception of the quality and price of domestic products correct i.e. are they inferior or not to foreign competing products? This is why, on the example of geotextile, it had been tried to find out what represent a domestic product compared to foreign competing products. Can such a marketing approach really contribute to coherent business decision-making process and consequently protect domestic production?

To this purpose, this paper should point to the necessity of applying, at least simple methodology, to address the problem of market analysis and competitiveness. For the purposes of this paper were compared, as an example, six competing products of the business entities from the textile industry (on the supply side), and were analyzed buying criteria of business entities from the construction industry (on the demand side) essential from the point of view of buying decisions. The B2B relationship was explored i.e. which criteria is important when is to deciding on purchasing and which products are better. Through this confrontation (comparison), it was to be determined how much the domestic product is competitive on the domestic market compared to foreign competitors.

An example of geotextile was a matter of circumstance.

2. AIM, CONTRIBUTION, HYPOTHESIS AND STRUCTURE OF THE PAPER

The aim of this paper is to point out the need to align the process of making business decisions with the determined characteristics of product competitiveness and determined consumer preferences, based on simple market and product research.

The contribution of this paper is a simple operational procedure to determine the competitiveness of the product in the market on the example of geotextile. It is about setting up a system of simple rules and procedures for marketing management of business functions, i.e. setting up of certain simple methodological procedures, for protection the business of the company. For that purpose, "proposal of the operational steps of a simple market and product research methodology" for an existing product in the existing market, has been devised for this paper. This is both, the practical and theoretical contribution of this paper.

The structure of this paper is set out as an example of applying a "proposal" based on which companies should act to determine market competitiveness of products and consumer preferences. For these reasons three (3) hypotheses H1 - H3 have been set:

- H1 - the quality of the domestic product is equal to or is approximately equivalent to imported foreign competing products
- H2 - consumer preferences are focused on price
- H3 - consumers are not sufficiently aware of the need and necessity to protect domestic products

The assumption is that the proposed market and product market research methodology allows the hypothesis to be verified i.e. correlates with hypotheses H1 to H3.

Operational steps, based on management and marketing principles for an existing product on an existing market, as mentioned before are referred to in this paper as a "proposal of the operational steps of a simple market and product research methodology" for an existing product in the existing market.

The proposal, based on cause and effect analysis, deduction, induction and empiry, implies the following steps:

1. (Step 1) to determine the criteria for the selection of competing products
2. (Step 2) to identify at least two (2) domestic and at least four (4) foreign geotextile producers present on the Croatian materials market with approximately the same parameters
3. (Step 3) to determine the wholesale prices on the Croatian market for the selected products
4. (Step 4) to determine standards and criteria for qualitative comparative analysis of materials
5. (Step 5) to determine the quality of selected products according to selected criteria
6. (Step 6) to determine the consumer preferences criteria when deciding on a purchase
7. (Step 7) conduct a survey among actual consumers / geotextile users
8. (Step 8) analysis of the results
9. (Step 9) conclusion.

3. METHODOLOGY

For the purpose of this paper, consumer preference research and material testing were carried out. It was done for the purpose of determining the most important product selection criteria (buying criteria) and the comparative determination of the quality of the selected products. The phases in which the research was conducted are as follows:

(1) Identifying the operational steps named as the "proposal of the operational steps of a simple market and product research methodology" for an existing product in the existing market (2) market

and price analysis (3) sample selection (4) sample testing (5) making of and pre-testing the questionnaire survey (6) collecting survey responses (7) data entry and data processing.

The survey questionnaire consists of issues relevant to determining consumer preferences in the B2B domain i.e. business customers, which issues gather data relevant for the ranking of product selection criteria. During the sample testing phase available materials on the Croatian materials market were used. The surface mass of the material, the thickness of the product, the breaking forces (tensile strength) F (md) and F (cd), and the stretching forces (tensile elongation at break) ε (md) and ε (cd) were tested.

During the phase of the survey questionnaire design, the pre-testing of survey questionnaire were done. After using it on a small sample, the questionnaire was improved and adapted, because it was shortened and simplified. After the improvement, the duration of the survey was reduced to only 5 minutes per respondent. In the next phase, was conducted a telephone survey. Questionnaire with eight (8) questions about priority buying criteria for geotextile consumers (such as price, quality, payment terms and conditions, etc.) was used, as shown in Table 8. The survey was conducted on a randomly selected sample of 70 construction companies ($n = 70$), which is approximately 0.5% sample of total population. At the beginning of each survey, it was verified whether the company used the geotextile for its business operation. The survey was addressed to 117 construction companies in Croatia. Collecting survey responses, 70 responses were actually obtained. The basis of sample selection was the database of business entities of the Republic of Croatia. The sample can not be considered representative, but selected one, because construction companies that have refused to take part in the survey because of business secrecy have been excluded. All the companies that participated in the research were aware of the fact that the survey was a secret and that their answers would be used solely for the purposes of this research. After the survey was conducted, the data collected from the questionnaire was entered in the Excel table and then statistical analyzes were performed on the computer using the Microsoft Excel program.

The statistical analysis methods used here were:

a) descriptive methods (tabular and graphical representation of data, percentages, mean values, dispersion measures) and

b) inferential methods (t-test differences in arithmetic means for small independent samples).

When selected the method of statistical analysis, it was considered that the simplest statistical methods are using in Croatian business practice, so the above methods were used in this research.

Conclusions regarding differences and correlations among variables were made at the usual 0.05 statistical level of significance ie with reliability of 95%.

4. PREVIOUS RESEARCH

There are two functions of a literature review. One, to provide a theoretical background of paper and two, to enable to contextualize findings in relation to the existing knowledge (Kumar, 2011). In order to ensure these two functions the literature review was done. In addition, „Market research is the vital link between the organization and its customers. The objective of sound market research is to interpret consumer behavior and translate the perspective of key customers into actionable marketing strategies” (Young, Javalgi, 2007:114). Therefore, „the goal of doing market research is to equip yourself with the information you need to make business“(CBNSC , 2018).

Numerous papers on subject of market research and analysis (Naresha, 2002, Shukla, 2008, Defense Standardization Program Office, 2008, Kumar, 2011, Market Research Process, 2019) cover a very similar market research methodology. Similar approaches can also be noticed by the other authors, such as Aaker, Kumar, Day (1995), McDonald (2004), Siropolis (1995) Fry, Stoner, Hattwick (2001) and Thompson, Strickland (2001). On the other hand, there are many different approaches to market and product research depends on the goal they need to achieve. Only several, with similar goals with this paper, have been isolated for the purpose of this paper.

In Guide to market research and analysis (CBNSC, 2018), understanding of customers and their preferences, recognition and planning for industry and economic shifts, monitoring the competition on the market and mitigate the risk in business decisions, are the recommendations for market research. This is obviously important, because in Choosing the right type of Market Research (Mora, 2015) understanding of customer’s opinions is crucial, both to product competitiveness and to marketing decision process. Also, according to same source, successful product testing should comprise, among others, determination of competitive advantage as well as possible threats from similar products/services, pinpointing of product features (both existing and potential) most important to the target audience and help in production of marketing messages to change or enhance existing perceptions about existing products or services.

„Understanding customers’ key buying criteria is vital to having a competitive edge“ (Campbell, 2016). There are numerous of possibilities how to make choice between different criteria. Price, quality, loyalty, distance of warehouse, working hours, staff, purchase time, speed and time delivery, paper works, previous satisfaction, effectiveness, promotion activities, product origin (foreign, domestic or precise country), range of products, service, method and terms of payment, scale, etc. For example, Kita et.al. (2017) and REDF (2019) in their researches were extracted six different factors each, of consumer preferences. Suwannaporn and Linnemann (2008) in their research about buying decision criteria yielded four factors: marketing activities (explained variance 26.8%), quality (13%), price (10.5%), and country of origin (7.7%).

The “only way you will really know about your market's buying criteria is to survey qualified people in your target audience” (McDuffee, 2017). Thus, for this paper a preliminary survey was conducted. (See Chapter Methodology).

5. MARKET AND PRICE ANALYSIS

The market and price analysis in this paper implies several different analyzes. The term "market" implies an existing market of materials defined as a geotextile, mass of 300 g / m² with similar characteristics. The domestic and foreign producers' supply were analyzed. Wholesale prices have been compared. On the ground of analysis, the relevant consumer preference criteria when deciding on purchasing (buying criteria) were defines. The results of survey determined consumer preferences based on selected preference criteria.

The criteria for the selection of competing products (*Step 1*) were determined following a conducted market analysis of the supply, by extracting domestic and foreign producers of geotextiles mass 300 g / m². The selection of competing products used acceptable criteria in terms of supply:

- presence on the existing Croatian market
- product availability
- fiber composition of product.

The original variety of material is manifested through the fiber composition of the material. Three materials with different characteristics were available on the market. Two non-woven and one woven geotextile:

- polyester (PES)
- polypropylene (PP)
- woven geotextile.

Woven geotextile was not taken into considered. Due to the fibre composition (geotextile mass 300 g / m²) and due to the minimum required number of manufacturers of non-woven geotextile (criterion for determining at least two (2) domestic and at least (4) foreign producers), selection criteria were met. Except the number of manufacturers of competing materials with approximately the same parameters, the criterion involve producers presence on the Croatian materials market. (*Step 2*) The results of selection are shown in Table 1.

Table 1: Selected Manufacturers by Default Criteria

No.	PES (polyester)	No.	PP (polypropylene)
1.	GEOTEKSTIL GEO RPES AG	4.	TECNODREN 300g, OVATTIFICIO

	300, Geo&Tex 2000 S.p.A, Italy		ALPINO SRL, Italy
2.	FILTER PLASTICA 300G, TEKSTIL LIO d.o.o., Croatia	5.	CESTOTEX 300G, REGENERACIJA d.d., Croatia
3.	GEOTEKSTIL 300g, FILC d.d. Slovenia	6.	DREFON S 300, MANIFATTURA FINTANA S.p.A., Italy

The next step was to determine the wholesale market prices for the selected products on the Croatian market (*Step 3*). The prices are shown in Table 2.

Table 2: Retail prices by manufacturers

No.	Product	Retail price in kunas per m2 in bale
	GEOTEKSTIL GEO RPES AG	
1.	300, Geo&Tex 2000 S.p.A, Italy	6,78
2.	FILTER PLASTICA 300G, TEKSTIL LIO d.o.o., Croatia	5,98
3.	GEOTEKSTIL 300g, FILC d.d. Slovenia	5,85
4.	TECNODREN 300g, OVATTIFICIO ALPINO SRL, Italy	5,60
5.	CESTOTEX 300G, REGENERACIJA d.d., Croatia	7,50
6.	DREFON S 300, MANIFATTURA FINTANA S.p.A., Italy	7,44

6. QUALITATIVE ANALYSIS OF SELECTED MATERIALS

For the qualitative comparative analysis of selected materials, it was necessary to determine standards (norms) and criteria (Step 4) on which it was possible to determine the qualitative difference between the selected materials. Based on the empirical guidelines of textile science and economy, the following criteria were selected:

- surface mass of the materials
- thickness measurement of the flat side of the products
- breaking forces - tensile strength F (md) and F (cd), and the stretching forces - tensile elongation at break ε (md) and ε (cd)

Considering the selected criteria, the norms were defined. Testing of surface mass of material was done according to HRN EN 29073-1 Textile - Testing Methods for nonwovens - Part 1: Determination of mass per unit area ISO 9073-1:1989; EN 29073- 1:1992. When measuring, for objective reasons, the norm was applied in a modified way: the test tubes were 6 cm radius or 113,09 cm². Based on this mass, the mass value for 1m² of material was converted. Testing of the thickness of the flat product was carried out according to HRN EN ISO 9073-2 Textile - Testing Methods for nonwovens - Part 2: Determination of thickness ISO 9073-2:1995; EN ISO 9073-2:1996, using thickness meter with a scale precision of 0,01mm. The distance between the appropriately positioned substrate and the pressing device was measured. Pressure on material during testing was 10 g / cm². Important criteria – determination of tensile strength and tensile elongation at break was carried out according to norm HRN EN 29073-3 Textile - Testing Methods for nonwovens - Part 3: Determination of tensile strength and tensile elongation at break ISO 9073-3:1989; EN 29073-3:1992. The instrument used for testing was a dynamometer for narrow strips.

7. RESULTS

Comparison of the quality of selected products according to the selected criteria (Step 5) was performed in accordance with the established criteria and the standards of qualitative comparative analysis of the material and the following results were obtained:

- Testing results of surface mass of selected materials - non-woven geotextiles with officially declared mass of 300 g / m² - See Table 3.
- Testing results for actually determined mass - See Table 4.
- Results of the determination of the thickness of non-woven geotextile 300 g / m² - See Table 5.
- Test results of the important criterion for tensile strength and tensile elongation at break - See Table 6.

Table 3: Testing results of surface mass (in g) of non-woven geotex declared mass of 300 g per m²

	Mass of sample surface 113,09 cm ²					
	1PES	2PES	3PES	4PP	5PP	6PP
1	3,2321	3,3413	3,7040	3,4738	3,2425	3,3816
2	3,4239	3,6050	3,4104	3,5690	3,5713	3,2072

3	3,3631	3,1399	3,1314	3,5370	3,2309	3,6579
4	3,2789	3,2539	3,5422	3,3903	4,0942	3,5855
5	3,0408	3,1466	3,1660	3,2598	4,1107	3,5517
6	3,1963	3,1648	3,1876	3,5703	3,8805	3,6336
7	3,0899	3,6124	3,4136	3,3973	3,1069	3,2716
8	3,3926	3,4921	3,1133	3,5890	3,2424	3,3439
9	3,5042	3,4247	3,1219	3,4772	3,3038	3,2278
10	3,6142	3,8059	3,4420	3,5589	3,6590	3,6943
\bar{x}	3,3136	3,3987	3,3232	3,4823	3,5442	3,4555
min.	3,0408	3,1399	3,1133	3,2598	3,1069	3,2072
max.	3,6142	3,8059	3,704	3,589	4,1107	3,6943
σ	0,1806	0,2292	0,2075	0,1058	0,3771	0,1889
V[%]	5,45	6,74	6,24	3,04	10,64	5,46

Meaning of symbols in table:

[g] = mean value; min. [g] = minimum value; max. [g] = maximum value; σ [g] = standard deviation and V[%] = coefficient of variation ($\sigma / \bar{x} \times 100$)

In order to find out, how significant is the difference in results of the selected sample mass for different materials, a standard t-test for 2 samples was used. The t-test formula is given by the relation (1). The meanings of the symbols are: \bar{x}_1 = mean value, n_1 = number of measurements, s_1^2 = variance (standard deviation square) - for one sample. Analogously the values are defined: \bar{x}_2 , n_2 , s_2^2 for the second sample.

$$t = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{s_1^2}{N_1} + \frac{s_2^2}{N_2}}}$$

(1)

For the first three products t-test shows no significant difference. Using this statistical method on samples 1PES and 2PES is obtained for t-value: $t = 0.924$. The critical t-value is $t_c = 2.1$ (with α -factor = 0.05 and number of degrees of freedom = 18). As $t < t_c$, it is concluded that there is no statistically significant difference between the results for 1PES and 2PES. It can be seen from Table 3, that the difference between samples 2PES and 3PES is even smaller than the previous one, so neither it can be significant. With this compare, the results of domestic product 2PES against foreign products 1PES and 3PES, show no difference in quality.

With analogue method, the samples 5PP (domestic) and 6PP (foreign) were compared. It is obtained: $t = 0.665$ and $t_c = 2.1$. Thus: $t < t_c$ implies that there is no statistically significant difference between these two samples. As the difference between 5PP and 4PP is even smaller (as can be seen in the Table 3), it is concluded that neither the difference between these two samples is significant. With this compare, the results of domestic product 5PP against foreign products 4PP and 6PP, also show no difference in quality.

The accuracy of the measurements expressed by the coefficient of variation shows that there are no significant differences in PES (polyester) measurements (all are less than 10%). Among coefficients of variation for PP (polypropylene) materials, a greater discrepancy (10.64%) occurred for domestic 5PP material. However, this difference is negligible.

In Table 4, actual surface masses of PES and PP have been calculated in grams per square meter, as they are declared in the retail at 300 g / m².

Table 4: The results of calculation of the actual surface mass of g/m²

Surface mass per material (g/m ²) and standard deviation per m ²						
	1PES	2PES	3PES	4PP	5PP	6PP
\bar{x}	293,00	300,53	293,85	307,92	313,39	305,55
s	15,97	20,27	18,35	9,35	33,35	16,70
V[%]	5,45	6,74	6,24	3,04	10,64	5,46

The results for the thickness measurement of the flat side of the products, are given in Table 5. They are also compared with the t-test, analogously as described above. Using T-test on samples 1PES and 2PES, is obtained for t-value: $t = 9.94$, and $t_c = 2.1$. Therefore, by comparing values, $t > t_c$ implies that there is a statistically significant difference in the results of these two samples. Namely, 1PES is significantly thinner than 2PES.

Table 5: Testing results of thickness (in mm) of non-woven geotextiles declared mass of 300 g per m²

Thickness (mm)						
	1PES	2PES	3PES	4PP	5PP	6PP
1	2,19	3,21	3,50	3,36	4,02	3,00
2	2,42	3,04	3,44	3,09	3,93	3,07
3	2,55	2,91	3,36	3,30	4,07	2,80
4	2,09	3,10	3,62	2,71	4,28	2,71
5	2,06	2,90	3,38	3,44	4,21	3,07

6	2,15	2,76	3,42	3,34	3,97	2,85
7	2,17	2,89	3,65	3,23	4,48	2,88
8	2,50	2,93	3,29	3,25	4,20	3,10
9	2,26	3,00	3,76	3,26	4,23	2,79
10	2,33	2,82	3,41	3,41	4,18	3,00
\bar{x}	2,27	2,96	3,48	3,24	4,16	2,93
min.	2,06	2,76	3,29	2,71	3,93	2,71
max.	2,55	3,21	3,76	3,44	4,48	3,10
σ	0,172	0,134	0,148	0,211	0,164	0,138
V[%]	7,57	4,52	4,25	6,51	3,94	4,71

Analogously to previous, 2PES and 3PES were compared. It was obtained: $t = 8.34$, $t_c = 2.1$. We conclude, since the $t > t_c$, that 2PES is statistically significantly thinner than 3PES. Therefore, the domestic material (2PES) is significantly thicker than the first foreign and significantly thinner than the second foreign material.

Furthermore, by comparing 5PP and 4PP it was obtained: $t = 10.85 > t_c = 2.1$, which implies that 5PP is significantly thicker than 4PP. From Table 5 it is clearly visible and/or understood that the product 6PP is even thinner than 4PP. The conclusion is therefore that the 5PP domestic product is significantly thicker than both foreign materials.

When considering breaking forces - tensile strength $F(\text{md})$ and $F(\text{cd})$ in Table 6, it is of interest to observe the difference between those two forces: $\Delta F = F(\text{md}) - F(\text{cd})$.

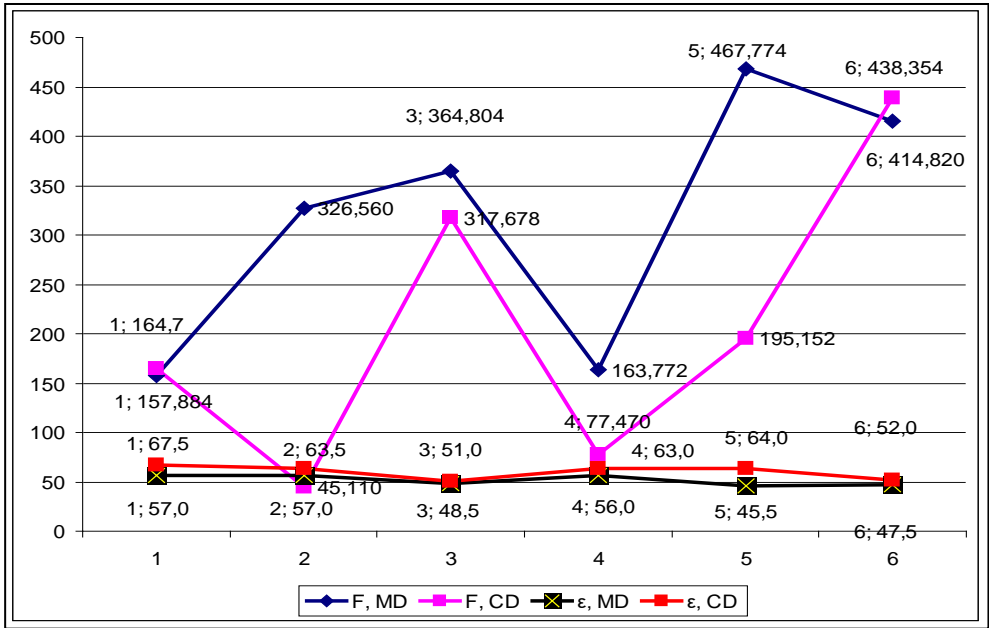
Table 6: Testing results for tensile strength and tensile elongation at break (numeric expression)

	F(md)		F(cd)	
	F[N]	ϵ [%]	F[N]	ϵ [%]
1PES	157,884	57,0	164,748	67,5
2PES	326,560	57,0	45,110	63,5
3PES	364,804	48,5	317,678	51,0
4PP	163,772	56,0	77,470	63,0
5PP	467,774	45,5	195,152	64,0
6PP	414,820	47,5	438,354	52,0

This is because the tensile strength in the direction of exit from the machine (machine direction) $F(\text{md})$ and the tensile strength in the cross direction $F(\text{cd})$, represent material strength in all directions.

This fact has a direct influence the quality of materials for the construction activity, which also affects the quality of the constructions/buildings itself.

Graph 1: Tensile strength F(md) and F(cd) and tensile elongation at break ε (md) and ε (cd)



For the testing of stretching forces - tensile elongation at break ε (md) and ε (cd) in Table 6 and Graph 1, stretching factor is defined as $\epsilon = \frac{\Delta l}{l_0}$ = (elongation of material) / (initial length of material), at the moment of break/interruption.

The differences between forces ΔF [N] are shown in Table 7. The results are rounded, no decimal expressions. In this case, standard deviations are obtained by adding standard deviations for each force: $s = s(md) + s(cd)$.

In addition, it can be seen from Table 7 that the difference between the breaking forces ΔF - is significantly higher in the case of domestic materials, than in foreign materials. So, according to this criterion foreign materials are in the favor. (See Table 6 & 7 and Graph 1).

Table 7: Results of calculated difference between forces and standard deviation

	1PES	2PES	3PES	4PP	5PP	6PP
DF[N]	-7	281	47	86	273	-24
s [N]	82	52	68	45	147	99

8. DEFINING CONSUMER PREFERENCES

The process of determination of the consumer preferences criteria when deciding on a purchase ie buying criteria (Step 6) included activities with which these criteria were established. During the pre-testing phase of survey questionnaire, consumers were responded to questions from the draft questionnaire, on a small sample. Disadvantages were noted, and the questionnaire was improved in a way that it was shortened and the questions were simplified.

Eight (8) criteria were established: closeness of warehouse, time delivery, price, country of origin - domestic, quality, payment terms and conditions, country of origin - foreign and other criteria. In the next phase (Step 7), survey was conducted among actual consumers ie companies that use geotextile in their business. All received answers were processed - a total of 70 responses from 117 respondents. The results were systematized in Table 8.

Table 8: Importance of consumer preference when deciding on purchasing

CRITERIA	1	2	3	4	5	6	7	\bar{x}	RANG
Closeness of warehouse				3	11	36	20	6,04	6
Time delivery			15	25	24	3	3	4,34	4
Price	23	45	2					1,70	2
Country of origin - domestic		3	12	19	18	18		4,51	5
Quality	47	22	1					1,34	1
Payment terms and conditions			40	23	7			3,52	3
Country of origin - foreign					10	13	47	6,52	7
Other criteria	-	-	-	-	-	-	-	-	-

9. DISCUSSION

When analyzing the results of the this research (Steps 3 through 8), it is necessary to point out that they do not scientifically prove the set thesis, but only indicate whether the given data support or does not support hypotheses. From the presented results of the research, it is possible to determine the following facts:

- There is a large number of suppliers of non-woven geotextiles available in the market. The material can be grouped into three groups. Two of three were selected according to the material composition - polyester (PES) and polypropylene (PP)
- The price of geotextiles varies considerably due to the variety of supply on the market and strong competition, but from selected competing products, the range prices vary from 5.60 to 7.50 kunas per m² in bale
- when examining the quality of the material, the results of the research have shown that each of the selected criteria affects the final attitude regarding the quality of domestic materials:
 - the results of the surface mass test for PES have shown that there is no statistically significant difference between domestic and foreign materials => according to this criterion for PES materials, domestic product quality is similar to foreign materials
 - the results of surface mass test for PP also have showed that there is no statistically significant difference between domestic and foreign materials => by this criterion for PP materials, domestic product quality is similar to foreign materials
 - the actual surface mass (g/m²) criterion shown in Table 4, indicates that the 5PP domestic manufacturer offers higher weight. According to the obtained sample, the manufacturer for the declared 300 g/m² offers 313.39 g/m². For 2PES, the manufacturer for declared 300 g/m² offer precise 300.53 g/m², calculated according to the given samples
 - the test results of material thickness for PES show that the domestic material (2PES) is significantly thicker than one foreign and significantly thinner than one foreign material
 - the test results of material thickness for PP, show that the domestic material (5PP) is considerably thicker than both foreign materials
 - the analysis of the breaking forces - tensile strength F(md) and F(cd) in Graph 1 and Table 7, clearly shows that there are significant differences in quality between domestic and foreign materials in favor of foreign ie for better material quality, the result of force difference $\otimes F = F(md) - F(cd)$ should strive to zero (0).

Determination of the customer preference criteria when deciding on purchasing (buying criteria), on a random sampling, reveals:

- Criterion „Quality“ has rank 1 (average rank $\bar{x}=1.34$) and is the most important factor when deciding on purchasing
- the „Price“ as a purchase decision criterion has a rank 2 ($\bar{x}=1.70$), a lower rank than the quality, but is more than twice as significant as the third criterion „Payment terms and conditions” with rank 3 ($\bar{x}=3.52$)
- It is surprising fact that the preference purchase decision criteria „Closeness of warehouse” (rank 6, $\bar{x}=6.04$) and „Country of origin – foreign” (rank 7, $\bar{x}=6.52$) are least important as purchase criteria

10. CONCLUSIONS

For the purpose of this paper was designed "proposal of the operational steps of a simple market and product research methodology", for the existing product in the existing market. This “simple products and market research methodology” should show how companies should access market and act on the market, in order to increase the selling efficiency of products in terms of detected market circumstances and comparative advantages. In addition, the assumption is that on the ground of this simple methodology the business decisions should be made. In this conclusion, according to the analysis of the results of this research, the results have to confront with the set hypotheses H1, H2 and H3:

H1 – the quality of the domestic product is equal to or is approximately equivalent to imported foreign competing products - the hypothesis is partly acceptable. According to certain criteria (material thickness and surface mass), domestic products meet these criteria, and they are even better. But, the most important criterion of breaking forces - tensile strength F (md) and F (cd) indicates a significant difference between the tensile strength in the direction of exit from the machine (machine direction) F (md) and the tensile strength in the cross direction F (cd). The result should strive to zero (0) to demonstrate the required material strength in all directions and thus the required quality. Selected samples of domestic materials are lagging behind that particular parameter because they do not meet the required condition and thus have reduced quality.

H2 – consumer preferences are focused on price - the thesis is partly acceptable. From the research results („Price“ as a purchase decision criterion has a rank 2, average rank $\bar{x}=1.70$) it is obvious that the contractors are increasingly concerned with high quality materials („Quality“ has rank 1, average rank $\bar{x}=1.34$). This attitude will enable them to perform contracts with quality work, regardless of the higher price of the material. Specifically, this criterion might be accurate according to the prices of competing materials (see Table 2), because their quality-well-done contracts provide new

contracts and further survival on the market, so the price does not play a decisive role, even though it affects on the gross margin.

H3 - consumers are not sufficiently aware of the need and necessity to protect domestic products – thesis is acceptable. According to the conducted survey, there are still other criteria such as Quality, Price, Payment terms and conditions, which are more important to them, in order to realize their entrusted work. However, it may be said that some minor number of contractors are in some way concerned with the protection of domestic products because “Country of origin – domestic” has rank 5, $\bar{x}=4.51$ and „Country of origin – foreign” has least important rank 7, $\bar{x}=6.52$.

According to the set hypotheses H1-H3, it is possible to conclude:

- that the competitiveness of the domestic product, on the example of geotextile, is not entirely satisfactory,
- that publicly-declared approach for deciding on purchasing of domestic origin of the product, is not present into that extent what would be expected considering promotional efforts "Buy Croatian"
- that the price (at least on the geotextile example) though, is not the most important factor when deciding on purchasing,
- „Quality“ with rank 1, average rank $\bar{x}=1.34$ and „Payment terms and conditions” with rank 3 ($\bar{x}=3.52$) have a significant place in decision making.

On the ground of basic assumption that the proposed methodology of market and product research correlates with hypotheses H1 to H3, the results of the research indicate the necessity of applying, even this simple, market and product research methodology. Analysis of the results has shown that it is necessary to compare products in the market and that consumer opinion and attitude research is important for business decisions. This is clear from the following arguments:

- Domestic product is necessary to qualitatively improve, at least to the level of foreign competing products
- Domestic origin of the product is not a crucial factor of purchase, regardless of other criteria
- Price is not always a crucial factor of purchasing, but it is quality
- All other factors mentioned above.

Finally, marketing approach has its justified purpose and meaning, and information’s gathered in this way, can contribute to meaningful business decisions that should follow after the analysis of the research results were obtained. By doing so, business entities could provide and / or improve their economic and competitive position in the market.

Further researches in this direction are recommended.

This paper is based on unpublished paper Novak, I., Kaštelan, S. Marketing of competitive advantages in the function of protecting the domestic product (on example of geotextile) and unpublished graduate thesis Kaštelan, S.: Dual comparison of selected factors of geotextile market analysis in Croatia

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Innovative supply chain in made-in-Italy system. The case of medium-sized firms

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ABSTRACT

This paper aims to provide the empirical evidence of the interaction mechanism in the open innovation system with particular attention to aesthetic and rational innovation in an Italian creative sector. Factors including rapid technological development, the advent of innovative openness processes involving sub-sectors belonging to diversified supply chains, shorter product life cycles, more diversified and customized, demande and fierce marketing competition, make today's business model increasingly unpredictable and risky. Building on relational based view, resource-based view and network analysis the purpose of this paper is to empirically explore the relationships among supply chain integration (SCI) and inter-company performance in global diversified supply chain. This is an exploratory study and the qualitative research method has been employed. This research has founded its context in the Italian knitwear sector which is part of the creative industries of the Italian fashion system. The data were collected through a series of semi-structured interviews with workers belonging to various areas of activity and with external actors such as yarn suppliers, buyers, institutional and non-institutional lenders. The purpose of this research is also to promote research methodological approaches to analyse different uncertainty scenarios for the future.

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1. INTRODUCTION

For an in-depth analysis of the competitive positioning of Italian manufacturing companies in the structure of the international offer, the fact that the market forms in which they operate are characterized by imperfect competitive conditions must be taken into consideration. Situation in which the changes that arise in the competitive comparison are almost continuous and this causes companies to adopt new technological and operational strategies. These must be the right ones to allow them to maintain the competitive differential against various competitors at least on critical success factors, such as product differentiation, the ability to manage complex order cycles, the use efficiently and on small scale of new process technologies, the use of new materials, etc.

Building on relational based view, resource-based view and network analysis the purpose of this paper is to empirically explore the relationships among supply chain integration (SCI) and inter-company performance in a global context.

About the methodology adopted in the research, still underway, we wish to clarify that the inductive method was used with empirical verification, in order to correctly interpret the management phenomena that emerged regarding supply relationship management.

The purpose of this research is also to promote research methodological approaches to analyse different uncertainty scenarios for the future.

Regarding the structure of the work, in a first part we propose the theoretical framework and the survey methodology, in the second some findings and managerial implications.

2. THEORETICAL FRAMEWORK

The study of the supply chain management (SCM) is based on the analysis of the relationships that are established between the economic actors belonging to the same technological-productive supply chain and between those connected or 'interdependent' supply chains. The constitution of evolved forms of partnership, however, is inevitably linked to the interpersonal skills of the individual actors.

We want to highlight that Italian fashion firms are frequently asked to review the positioning of the products offered and to consider that the acquisition of new segments may allow us to achieve a renewed and effective international positioning.

A significant phenomenon is the repositioning in the international supply chain by Italian manufacturing firms operating in the B2B markets of fashion knitwear. In recent years there have been many companies that have modified the content of the strategies and characteristics of their organizational structure in order to protect new 'interstitial spaces' (or micro-segments) in international markets. This new and more favourable competitive positioning in the international business markets has been successfully achieved by those companies that have been able to change their position regarding the 'global supply chains'. Precisely their particular ability to identify in which segments of the sector in which they operate, revealed in particularly critical years, when the international supply system was reorganized, was the element that allowed non-large companies to create differential assets in the competitive context.

In order to effectively exploit resources, firms must not only be able to leverage existing resources but also to develop new and dynamic capabilities to maintain competitive advantage in changing industry environments. This in agreement with the managerial literature about resource-based view (RBV) (Barney, 1991; Teece et al., 1997; Wernerfelt, 1984). Organizations can build these above-mentioned dynamic capabilities through organizational innovations, which are new methods used in business practices, workplace organization, or external relationships.

Many studies show that suppliers are willing to invest resources (organizational, know-how, etc.) only with some of the industrial customers belonging to a larger portfolio. In fact, the need to compete in a dynamic economic and competitive environment encourages the design of forms of cooperation that facilitate the exchange of relationship-specific information (Steinle e Schiele, 2008; Schiele et al., 2011). The following is therefore hypothesized.

H.1 The supply chain integration strategies at the 'supplier side' increases manufacturing performance capabilities.

A further starting point for reflection and managerial investigation is the emergence of new buyer-supplier relationships in new product development (NPD) processes. Industrial innovation based on the involvement of suppliers in specific and experimental 'design-engineering' processes that highlight the need for buyers and suppliers to structure the international bargaining and relational governance in a new way.

More recent NPD studies start to show challenges of managing suppliers in a buyer's innovation process. There is mixed empirical evidence regarding the effectiveness of supplier involvement for enhancing buying company NPD performance. To explain why, the empirical literature has mostly focused on pre-contract strategies, such as supplier's base rationalization, supplier integration, supplier selection, or post-contract tactics, such as supplier involvement timing, supplier design responsibility, or project execution. Relatively less attention has been focused on the contracting process that the buying company uses to motivate supplier participation, which seems to imply an assumption: a supplier is always willing to participate in buyer innovation projects irrespective of the contract. This assumption is problematic because a supplier, as an autonomous organization, could reject a buying company's offer that is either too risky or does not produce enough return for the supplier, especially when the supplier possesses valuable resources for buying company innovation (Barney, 2012). The following is therefore assumed.

H2. The dynamism of the competitive environment represents important motivations for the participation of the supplying companies to NPD initiatives and the development of supply chain relations.

Many studies have pointed to creativity as a principal driver of innovation: individual creativity is identified as a core of creative process that can be enhanced through elements of strategic culture and managerial practices (Stojcic et al., 2018).

This paper aims to provide the empirical evidence of the interaction mechanism in the open innovation system with attention to aesthetic and rational innovation in a creative sector. The purpose of this paper is to provide empirical evidence of the specific open innovation mechanism to improve the design value of innovation processes that focus on aesthetic and rational factors.

Previous research has attracted the attention of research on technological innovation in the technological fields as the main research contexts (Duysters and Lokshin, 2011; Jiang et al., 2010; Spender et al., 2017). Therefore, to obtain a broader picture of the structural characteristics of the innovation ecosystem, this document aims to provide an understanding of aesthetic innovation by focusing on exploring the role of actors (area managers, suppliers, buyers, institutional actors) and of supply chain relationships to facilitate or less innovation in the creative sector.

Firms utilize relationships for competitive advantage by accessing, integrating, and leveraging external resources: relationships are relevant across a myriad of relationship forms, including alliances, joint ventures, supply agreements, cross-sector partnerships, networks, and consortia (Gölgeci et al., 2018).

An extension of resource-based view is the knowledge-based view (KBV) that proposes knowledge as being a firm's most strategically significant resource. Specifically, knowledge is embedded and contained within multiple entities and can converge to enhance an organization's competitive advantage (Grant, 1996). Previous research has examined open innovation and its related interactive mechanism then contributed to the understanding of how generate outcomes in innovative relationships (West and Bogers, 2014; Spender et al., 2017). Evidence regarding the role of actors remains fragmented. For instance, the relationship between innovation creator actors (firms, start up, teamwork) and innovation seekers (founders, business angels, etc.) is understood. The context of R & D collaborations and technology alliances is more analysed (Faems et al., 2010). Thus, research attention to diverse supply chain should be considered.

H3. In turn these organizational innovations may involve operational innovations which are entirely new ways of doing things, like filling orders.

3. FROM THE RESOURCE-BASED VIEW TO THE NETWORK ANALYSIS PERSPECTIVE

Network analysis is a bit relational based view and a bit resource-based view. Within a relational theoretical field, the network perspective sees market as business network, where business units or firms are represented by nodes, and long-term complex interactions between them are represented by links (Håkansson and Ford, 2002).

In the strand of research resource based, academic interest in the prerequisites of business, or strategic networks' successful exploitation is much more recent. From a resource-based perspective firms differ in their capability to shape and exploit networks, to extent that their capability to leverage networks has been identified as distinctive.

With regard to specific network capabilities, it can be observed that if firms seek increased market, innovation and financial performance, they need to develop network specific capabilities (Yu et al., 2013). One such critical capability refers to management skills and competencies in developing

valid views of networks and their potential evolution, a condition to perceive the opportunities embedded in networks.

Recent empirical studies refine the conceptualization of network pictures by testing the dimensions of this concept and adopting a dynamic view, focused on the processes through which networks are understood and strategy enacted within them. Networks are structures that convey information in markets, provide a competitive advantage to some actors over others, and offer opportunities otherwise unavailable (Czakoń and Kawa, 2018).

4. INNOVATIVE OPENNESS PROCESSES WITHIN MANUFACTURING SYSTEMS

Knitwear firms develop processes that seek out and transfer external knowledge into their own productive innovation activities. They are also available to identify with the same supply partners the new co-creative innovative processes to move unutilized internal knowledge to other organizations in the surrounding environment. They are also available to identify with the same supply chain partners the new co-creative innovative processes. We want to put the attention on the wide distribution of useful knowledge, such that no single research organizations or single companies have a monopoly on useful knowledge. This, together with environmental uncertainty and the complexities of innovation, requires more permeable organizational boundaries that enable combinations of innovative resources (within R&D, Manufacturing and marketing areas) beyond and individual actor's resource endowment.

The innovative phenomena found produce value not so much through the collaborative exchange process but also by the participant's ability to capture the value of other innovative actor's value creation effort in cross supply chain innovative processes.

The tension between value creation and value capture is considerably attenuated by the innovative openness phenomena. For example, value creation in open innovation requires firms to be open in order to leverage the knowledge of diverse contributors, while value capture necessitates a tighter, more protective process (paradox of openness) (Laursen and Salter, 2014). This tension is lost in manufacturing-based enterprises that are able to industrialize new knowledge in their production systems. Knowing how to process generates the growth of embedded knowledge: this favours the appropriation of the value of 'protective practices'. Managers need to work toward the development of an open-innovation capability, which comprises four value processes: value provision, value negotiation, value realization, and value partake (Appleyard and Chesbrough, 2017; Chesbrough et al., 2018). The value added of dynamic innovative componential lies in structural innovation characteristics and in creative processes.

Many studies have pointed to creativity as a principal driver of innovation. In this paper we want to verify the strategic and operational significance of the impact that innovation has on significant performance parameters such as profitability, financial performance, competitiveness on international markets (see table 1). Based on empirical research, it was possible to more analytically identify a

variety of first and second level metrics. Firms can develop processes to seek out and transfer external knowledge into their own innovation activities. They can also create channels to move unutilized internal knowledge to other organizations in the surrounding environment.

Table 1. Metrics (I and II level) for performance evaluation.

Outcomes	Detail level	Micro-level analysis
Market aspects	-Kinesthetic value	-emotion, donning, safety
	-Rational value	-increase in opportunities for use
Economic aspects	-Profitability of the firms	- Roi and cash flow of the collection
	-Productive know how improvement	- productivity of worker and capital
	-Employment opportunities	- increase in the know-how of workers
	-Economic impact for other stakeholders	- innovation spillover effects
Knitwer-suppliers relationship	-Relationship specific aspects	-relationship age, shared business volume
	-Specific factors at the micro-level analysis	-founders (type and number), dynamism and complexity of innovative projects

Source: our elaboration based on empirical investigation.

It has been found that the greater the knowledge gap between companies, the greater the opportunities that companies can derive from forms of intership (Tomlinson and Fai, 2016)

From here, the following is shown:

- a. the importance of new supply chain relationships in the innovative processes of innovation;
- b. the knowledge gap in the supply chain does not hinder the design of innovative openness phenomena, which may even represent opportunities for small and medium sized firms (SMEs), even in traditional sectors.

In practice, we want to reiterate that the similarity of embedded know-how and R&D architectures among the supply chain actors can even mitigate positive effects.

Generally speaking, this study provides evidences that product innovation has a positive effect on both export propensity and export intensity by increasing the chance of opening new foreign market segments and new competitive processes (Van Bevere and Vandebussche, 2010; Tavassoli, 2018; Wu and Jia, 2018).

Innovation, that is, the propensity for innovation of the companies belonging to the investigated sub-sector is effectively measurable no longer monitoring the amount of investments in R&D over the years, but observing the expansion of the innovative portfolio, i.e. the addition of further 'innovative business models'. Following the empirical survey, it emerges that outputs are more useful than inputs to interpret the positive impact that innovation has on exports; in practice, success on the micro-segments of international markets depends heavily on the variety of business models that arise from innovative business activities. In addition, since considering R&D as a measure of innovation excludes those smaller firms which do not have any separate R&D department, the research focused on the innovative efforts repeated several times over the course of a year by the creative enterprises of the Italian fashion system.

The creativity of the supply chain permeates the supply chain relationship and produces the virtuous following effects:

- they favour the new down-stream supply chains
- they produce positive effects on the supply chain offer
- they generate new cross-industry up stream relationships:
- they favour the resource alignment regarding the technological capabilities in each supply chain enterprise

We focus our attention to technological innovation, in the belief that aesthetic innovation can be either facilitated or inhibited within this open innovation setting where limited protection and dynamic knowledge flows occurring across organizations (Eikhof and Haunschild, 2007; Lin, 2018).

Because incremental and breakthrough innovation involves different types of resources and activities (e.g., Colombo, von Krogh, Rossi-Lamastra, and Stephan, 2017; Qi Dong, McCarthy, and Schoenmakers, 2017), the heterogenous knowledge that a focal firm might be exposed to from its network partners is likely to influence its innovation differently.

In the current economic contexts, we are witnessing profound changes in the processes of structuring supply chains at an international level (Arregle et al., 2009; Cantwell, 2009; Miller and Eden, 2006; Rugman and Verbeke, 2004).

5. METHODOLOGY

This is an exploratory study and the qualitative research method has been employed. With the aim of exploring rational and aesthetic innovation in the creative sector, this research has founded its context in the Italian knitwear sector which is part of the creative industries of the Italian fashion system.

During the empirical survey, forty Italian companies belonging to the Italian luxury knitwear fashion located in central Italy were taken into consideration.

The analysis covered the period 2010-2018 and involved the industrial companies, customers and other economic operators in the supply chain (yarn suppliers, IT service providers, intermediaries, territorial and research entities, etc.)

The data were collected through a series of semi-structured interviews with workers belonging to various areas of activity and with external actors such as yarn suppliers, buyers, institutional and non-institutional lenders.

Owing the study's exploratory nature, we decided to adopt a research methodology based on the use of a qualitative analysis of business cases (Yin, 2003). Case studies have several advantages; first, they allow one to understand the relationships between a phenomenon and its context and enable scholars to match different data that could enhance a research object's analysis (Dubois and Gadde, 2002). Second, as Stake (1995) notes, case study methods allow one to investigate and to interpret new innovative phenomena both in managerial and in strategic sense, in real time.

6. REQUESTED SUPPLIER'S PERFORMANCE

The focus of the studies within channel management literature is to understand how to manage the supplier's commitment and responsiveness to the time-sensitive requests of the company (Figure 1). The behaviour of suppliers in terms of their responsiveness is found to be less a function of competitive pressures and more a function of close relationships and open communication between the focus company and its suppliers (O'Connor et al., 2018).

a) Response of suppliers to Operations-based challenges

Operations-based challenges cover the efficiency of the product development and manufacturing processes. When suppliers perceive their major challenge to be operational in nature, such as product development and human resources productivity, they are likely to resort to business re-engineering type response (to use the answers of the type re-engineering of the business).

Operations-based challenges focus suppliers' efforts on business re-engineering in several ways including automation, research and development, production efficiency, and human resources initiatives (those aimed at increasing worker productivity).

b) New product development (NPD) activities in the relational processes of supply chains

Suppliers contribute to buyers' product innovation efforts in a wide variety of ways. One major benefit can be a more efficient development process, better product quality, and improved product manufacturability.

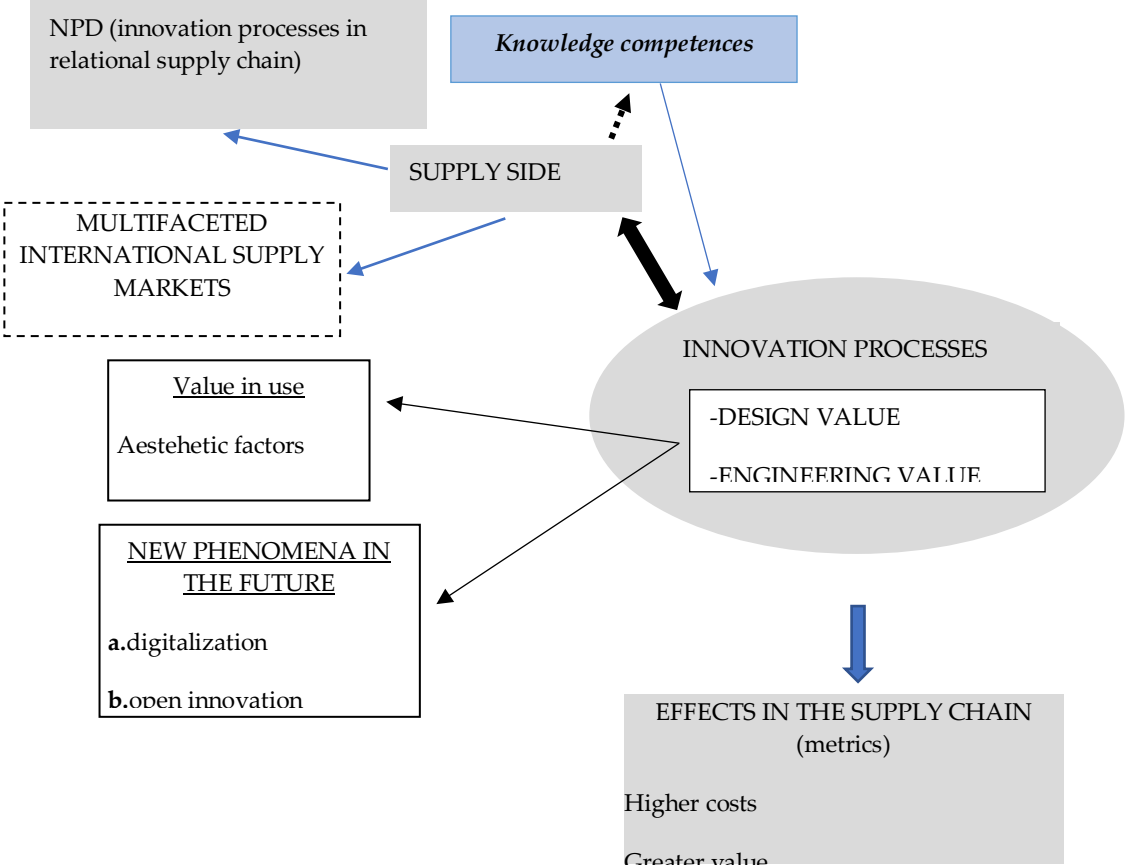
When engaged in the process at the right time with an appropriate level of design responsibility, suppliers contribute to the success of a buyer's NPD project by providing access to advanced technology, helping understand design feasibility, improving translation of customer requirements into manufacturing specifications.

Of the few empirical studies that examine ‘contract design in innovation’, the focus has been on comparing the effectiveness of fixed-price and flexible contracts (cost sharing or performance based) (Gopal and Sivaramakrishnan, 2008; Yan et al., 2018).

The analytical contract management literature has extensively studied contractual coordination in a buyer-supplier production context. The focus of this stream of work is on the design of a contract, specified by parameters, such as revenue share, fixed fee, investment levels, quantity discounts, that maximize supply chain utility by aligning buyer and supplier incentives.

The literature showed that relational governance complements formal contract in more ambiguous, uncertain and complex innovation contexts (Carson et al., 2006; Mani et al., 2012) other Authors find that flexible contracts within a firm provide the greatest incentives for employees to innovate when compared to fixed-fee and pay-by-performance contracts. There are also few studies that examine the effectiveness of fixed price, cost/material sharing, and performance-based contracts vary in different outsourcing contexts.

Figure 1. Significant phenomena in a strategic and managerial sense



Source: our elaboration

Although not directly examining contractual design in NPD projects, a few empirical studies discuss potential benefits of aligned goals or risks of conflicting objectives: buyer-supplier conflict intensity is negatively associated with NPD performance.

7. CONCLUSIONS

During the empirical survey, it was noted that, especially in recent years, small and medium-sized industrial companies belonging to a supply chain formulate strategies that make them variously interdependent with different supply chain stages.

Small and medium-sized enterprises operating in international business markets become economic actors in stages complementary to those to which they traditionally belong and consequently are included in interdependent supply chains. In this way international supply chains are affected by 'externalities' that increase their indeterminacy (or uncertainty): they increase their weight and their value the intangible elements of the economic relationship, whether established in the context of contractual relations or inserted in strategic partnerships. The study of trust relationships that develop between organizations are particularly important for understanding the evolution of competitive dynamics that have characterized the international business markets in the last few years.

About inter-firm relationship and from a supplier's perspective, it represents an assurance that the relationship will be subject to good-faith modification if it proves detrimental in light of changed circumstances.

Firms increasingly rely on business-to-business (B2B) relationships to gain resources and capabilities. In the context of a B2B relationship, the focal firm means the recipient of resources and the partner firm means the provider of these resources (Zaefarian et al., 2011).

Factors including rapid technological development, the advent of innovative openness processes involving sub-sectors belonging to diversified supply chains (specially at the 'supply-side' level) shorter product life cycles, more diversified and customized demand and fierce marketing competition make today's business model increasingly unpredictable and risky (Sreedevi and Saranga, 2017; Tang and Tomlin, 2008).

Another knowledge indirectly acquired by this research field is to understand how the consistency between the objective and the perceived competitive uncertainty might affect the supply chain.

The purpose of this research is also to promote research methodological approaches to analyse different uncertainty scenarios for the future.

8. ORIGINALITY AND RESEARCH VALUE FOR THE FUTURE

Regarding the improvement of company management, many mature and well-known techniques have been proposed for the analysis of the production process (planning choices, engineering activities) and optimization, including continuous improvement and radical re-engineering approaches (Lehnert et al., 2017).

The current paper investigates empirically the relationship between relatively radical changes in R&D firm-choices occurring within small time windows and an assessment of the extent of the firm's exploratory knowledge activity.

The research provides important contributions for both strategic management and innovation literatures, especially when the author considers the role of firm-specific operations systems resources to drive the innovation of the manufacturing-based firm innovativeness.

The author also contributes to the literature by highlighting useful links that can improve the company's innovation through interaction with industry-level operators (suppliers and buyers) and other external resources such as unusual financial institutions (crowdfunders, angel investors).

This research work allows us to better understand how creativity positively influences companies in the fashion system by implementing radically new innovative processes and efficiently performing production activities.

For the future development of the research work, it cannot be overlooked that in-depth knowledge of the environmental conditions under which the companies implement different types of supply chain risk management strategies, logistics flexibility and relationship flexibility can be a valid aid to the implementation of the most modern also supply chain risk management (SCRM) procedures.

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Factors Affecting the Perception of Bancassurance: The Case of Malta**

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ABSTRACT

Our aim with this study is to delve into the perception of Maltese nationals on bancassurance to establish the drivers which are influencing the purchase of bancassurance and whether these factors can be used by banks to positively impact Maltese nationals' perception of bancassurance and hence increase their sales and revenues. In order to establish the perception of Maltese nationals on bancassurance, we applied three areas of Customer Perception Theory namely 1) self-perception 2) price perception and 3) benefit/risk perception. To establish the perception of Maltese nationals on bancassurance, the whole population of Maltese nationals was taken into consideration from which a sample of 384 people was taken. In order to carry out the survey, the authors used questionnaires which included a number of demographic questions. The authors also included a number of statements which were divided into the three sections of the Customer Perception Theory. For these statements, the authors used a five point Likert scale ranging from strongly disagree to strongly agree where the participants had to rate the statements according to their level of agreement. The authors also included a comment box to allow the participants to express themselves. The study revealed that various factors are stopping Maltese nationals from purchasing insurance products from banks. Advertisements are not motivating Maltese nationals to purchase insurance products from banks, however they do trust banks and hence they might decide to purchase insurance products from them. The uncertainty of Maltese nationals on the premium charged and whether the costs are reduced when purchasing insurance products from banks shows the lack of knowledge amongst Maltese nationals on bancassurance. On the other hand, the idea of a 'one-stop-shop' motivates Maltese nationals to purchase insurance products from banks. This study can serve as guidance for local banks, which are engaged in bancassurance as well as to those banks who intend to engage in bancassurance in the future. This is because this study highlights the factors, which are stopping Maltese nationals from purchasing insurance products from banks. The two main sectors in the financial services industry, which play an important role in the Maltese economy, are the banking and the insurance sectors (Finance Malta, 2018). As far as the authors are aware, this study of the perception of Maltese nationals on bancassurance is the first of its kind conducted in Malta. Hence, other researchers may use Malta as a case study to act as a model to transpose the findings to larger countries.

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1.1 Introduction

As Oosenbrug and Zoon (2012) stated:

Europe is getting older. While the ageing population could put pressure on economic growth and welfare provision, it could also open up valuable

opportunities for insurers as affluent Baby Boomers head for retirement (p.2).

A survey carried out by the National Statistics Office (NSO) in 2017 found that 18.8% of the total population living in Malta was 65 years old and over. As can be observed in Figure 1.1, the ageing population in Malta is on the increase (National Statistics Office (NSO), 2018). As people get closer to their retirement age, they tend to realise the need to purchase life insurance or take up a private pension plan (Oosenbrug & Zoon, 2012). The purchasing of these products entails saving money.

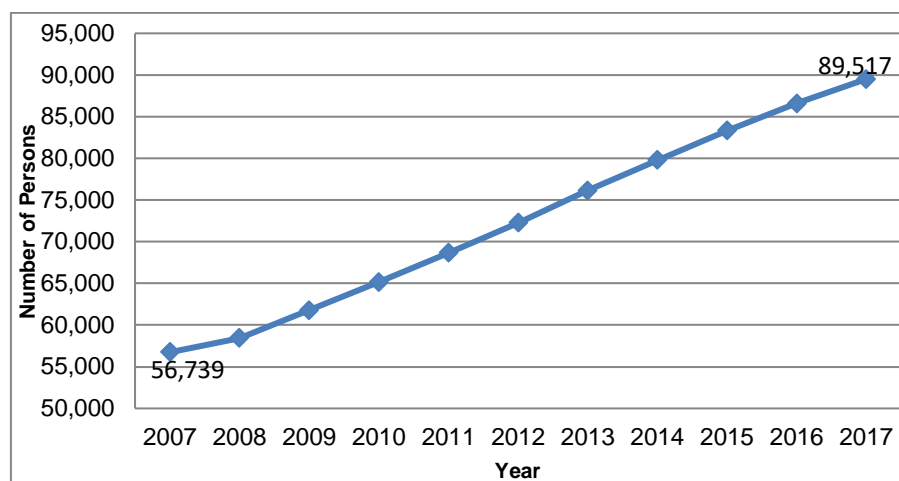


Figure 1.1: End-of-year population estimates of persons aged 65+: 2007-2017 (adapted from National Statistics Office (NSO), 2018).

Saving money is usually associated with depositing money in a bank account which will eventually lead to the earning of small interest. Instead of depositing money into a bank account, one can also purchase savings life insurance products and hence will have the possibility to earn higher interest than just leaving the money in a bank account (Akrani, 2011).

The purchasing of savings life insurance products is not only possible from insurers but also from banks who enter into agreements with insurers to sell insurance products (Ghimire, 2013). By purchasing these insurance products from banks, one would have the opportunity to have one's money managed by only one institution rather than having to source multiple entities. (Teunissen, 2008).

1.1.1 The Bancassurance Concept

The term 'bancassurance' was first used in France and it is a combination of two words; 'banc' and 'assurance' which refers to the selling of insurance products using the bank's client base. Bancassurance which is also referred to as 'allfinanz' involves a package of financial services that can satisfy the customer's needs with respect to banking and insurance (Ghimire, 2013).

Gonulal, Lester & Goulder (2012) defined bancassurance as the process of using a bank's customer relationships to sell life and non-life insurance products and it is emerging as a natural pathway for the effective development of insurance.

Due to the globalisation of the economy and other factors such as the enhanced use of technology, the insurance market is one of the main markets which helps the banking sector to continue to expand and develop at a faster rate (Clipici & Bolovan, 2012). This will lead to a point where a bank can sign an agreement with an insurance company to sell the latter's products earning an additional stream of revenues and hence increase its profits (Shah & Salim, 2011).

Once the bank and the insurer enter into the agreement of bancassurance, both will benefit (Fields et al., 2007 b). The main benefit for both institutions is that banks will earn an additional stream of revenue by charging a fee to the client when purchasing an insurance product from the bank while the insurer

will expand its customer base without the need to increase sales or pay broker's and agent's commission (Ghimire, 2013). Additionally the customer benefits by having access to a range of both financial and insurance products from a 'one-stop-shop' (Francis, 2014).

1.1.2 The Bancassurance Concept in Malta

Over the years the Maltese population has been choosing bancassurance rather than other distribution channels to purchase life insurance. From Figure 1.2 below, it can be noted that between 2011 and 2013 the Gross Written Premium (GWP) has decreased from 82.2% to 78.8% followed by an increase to 81.9% in the years 2014 and 2015. As a second option to bancassurance, people prefer to purchase life insurance products from agents, followed by brokers and direct insurers respectively (Insurance Europe, 2018 b). It is important to note that Maltese banks cannot sell non-life insurance products. These products can only be sold by insurance companies (Buttigieg, 2014).

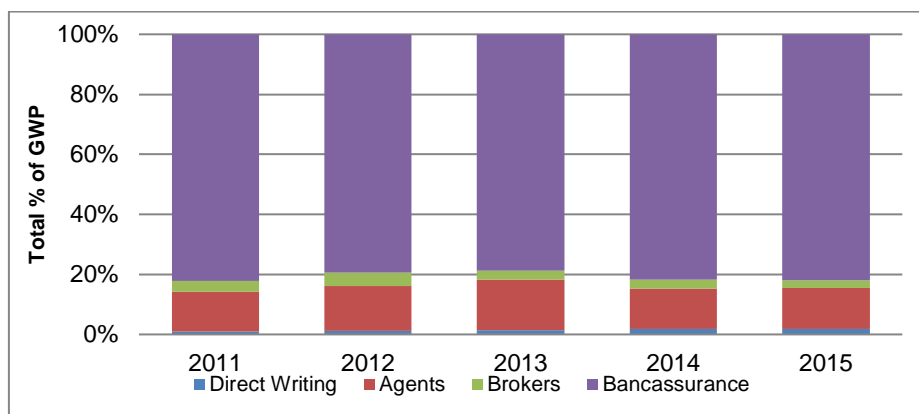


Figure 1.2: Distribution channels of life insurance in Malta from 2012-2015 (adapted from Insurance Europe, 2018 b)

1.2 Aim and Motivation

In the Maltese economy, the financial services industry plays an important role where its two main sectors are the banking and the insurance sectors (Malta Financial Services (MFSA), 2017). Since bancassurance was introduced in Malta, a number of studies have been carried out. However, as far as the authors know, a study on the perception of the Maltese population on bancassurance has never been carried out.

Therefore, by means of this study, the authors objective is to understand the perception of Maltese nationals and identify the main influencing factors on the purchase of bancassurance and whether these factors can be used by the banks to positively impact the Maltese nationals' perception on bancassurance and possibly increase their sales and revenues.

1.3 Significance of the Study

Malta is a small island in the Mediterranean Sea which lies between Europe and North Africa. It is one of the world's smallest islands, with a population of around 475,000 inhabitants. It is a member of the European Union and the Eurozone (Finance Malta, 2014). A major contributor to the Maltese economy is the financial services industry where its two main sectors are banks and insurance companies (Finance Malta, 2018). As noted from Figure 1.2, the choice of bancassurance over other distribution channel to purchase life insurance products by Maltese nationals has been increasing continuously (Insurance Europe, 2018 b). Therefore, enhancing the bancassurance concept in Malta will arguably lead to a greater expansion in the financial services industry, given that bancassurance is the merger of a bank and an insurance company.

Case studies conducted in small islands such as Malta have been used by various researchers who used small islands as a laboratory experiment for use in larger regions (Bezzina et al., 2014). According to Bezzina et al. (2014) there are a number of characteristics on Malta's financial system and history which makes studies on the financial system more interesting. Specifically:

1. Malta's governmental and administrative structure is similar to that of Great Britain. Unlike other small islands, Malta adopts a centralised system of government with strong and different political parties and a national Constitution that makes provisions for a number of scrutinizing agencies (Pirota, 2001).
2. Malta has an outsized banking sector despite its size.
3. Malta's financial centre includes six strong domestic banks.
4. During the 2008-2009 financial crisis there were no bailouts in Malta as opposed to other countries in Europe (Bezzina et al., 2014).

In her study, Bugeja (2017) stated that the mentality of Maltese nationals with regards to banks is that banks are institutions which only offer financial products. However, Bugeja (2017) is convinced that by identifying the perceived factors that are influencing the purchase of bancassurance, banks would use them to positively impact Maltese nationals' perception regarding this matter and possibly increase their sales. All of this will eventually improve the concept of bancassurance in the local market (Bugeja, 2017).

1.4 Research Questions

With this study we aim to determine the following :

1. What are the perceived factors influencing the purchase of local bancassurance?
2. Can these factors be used by banks to positively impact the Maltese nationals' perception of bancassurance and possibly generate more sales?

2. Literature Review

2.1 The Evolution of the Bancassurance Concept

The traditional view of banks and insurance companies is that banks handle funds whereas insurance companies take risks. The main similarity between the two is that they form part of the financial services industry. Various authors have put forward the idea that these two sectors have more similarities than differences (Genetay & Molyneux, 1998).

The main function of a bank is to accept deposits and give out loans whereas the main function of an insurance company is to provide financial protection in case an insured unexpected event occurs to the subject matter being insured by the policyholder (Gumbel, 1990).

An important distinction that Delporte (1991) emphasized was about the term of the savings. The banking industry offers short term and medium term savings whereas the insurance industry offers long term savings. Another important distinction is the area of specialisation where banks are responsible for handling and managing funds whereas insurance companies are responsible for handling risks (Levy-Lang, 1990).

Fields et al. (2007b) argued that banks and insurance companies are both financial intermediaries that pool savings of individuals which are transferred to capital expenditure.

Lewis (1990) argued that in portfolio management, banks take advantage of economies of scale arising from the law of large numbers. This means that as deposits withdrawals do not affect the other depositors. Insurance companies rely on the law of large numbers which states that as the sample grows, the expected loss distribution will become closer to the true loss distribution (Cummins, 1991). This enables insurance companies to pool reserves to protect against any losses that might occur. Similar to insurance companies, banks provide insurance of financial security for their clients where the premium

includes the service charges and the spread between interest rates charged on loans and interest rates paid on deposits (Lewis, 1990).

Banks and insurance companies are both involved in fund management and risk bearing. Moreover, both banks and insurance companies can be seen as complementary to each other. This is because when a bank gives out a loan to an individual, the bank requires the individual to purchase several insurance products such as life insurance and income protection insurance to protect against any losses. This means that if something unexpected happens to the borrower, the bank will be granted the sum assured and hence the loan will be paid out. Therefore, if the individual does not have any insurance products backing up the loan and an unexpected event occurs where the individual cannot pay the loan, the bank will lose the money. To summarise, this means that banking and insurance products provide a means of savings and insurance (Genetay & Molyneux, 1998).

2.2 History of Bancassurance

Bancassurance was introduced in France in the 1980’s with the mergers of banks and insurance companies. Throughout the years, these mergers have been continuously increasing. However, due to legislative restrictions in the US, banks and insurance companies could not enter into this new line of business there. However, in 1999 the Gramm-Leach-Bliley Act was introduced where deregulation took place. Consequently, the US banks and the US insurance companies could enter into the bancassurance market by forming a financial holding company also known as universal bank (Fields et al., 2007 b). For a better understanding of the development of bancassurance, one must refer to the framework introduced by Daniel in 1995 describing the evolution of bancassurance products. With reference to other European countries, Daniel’s (1995) framework is based on the French market (Genetay & Molyneux, 1998). Daniel (1995) divided his framework into three periods: before 1980, after 1980 and around 1990, as shown in Table 2.1.

1980’s		1990’s	
Products	Extension of banking	Savings products classified as life assurance	Diversification Supply: Pure life and complex financial products

Table 2.1: The Evolution of Bancassurance (adapted from Hoschka, 1994)

In the first period, before the 1980s, the products sold by the banks as a direct extension of their activities were not associated with insurance such as credit insurance. According to Daniel (1995), the second period started around 1980 when banks started to produce and sell different financial products. Hence, it is believed that the growth of bancassurance originated here. In this period, banks began to exploit capitalisation products such as endowment contracts whereby the policyholder would get the lump sum at maturity if the policyholder is still alive (Fields et al., 2007 a). Hence, one can note that although there is an element of insurance in these products, there is also an element of savings. According to Pitt (1990), many analysts observed that these products were merely bank products rather than insurance products (Hoschka, 1994).

Daniel (1995) described the third period as ‘crucial’ in the development of bancassurance. During this time, banks started to move forward and tried to be innovative by developing more complex products to satisfy customer needs. They came up with unit linked and investment linked policies and pure life insurance products (Hoschka, 1994).

This overview of the development of bancassurance highlights the various forms of bancassurance models. Over the years, bancassurance has been expanding, embracing both the distribution and the

production of insurance. Moreover, the evolution of bancassurance led to a customer-driven approach in the context of financial products (Genetay & Molyneux, 1998).

2.3 Bancassurance Models

The type of bancassurance model chosen depends on several factors such as the social-economic environment, the regulatory environment, the cultural environment and customer choice. The main bancassurance models are the distribution agreement, the strategic alliance agreement, the joint venture agreement and the full integration agreement (Teunissen, 2008). The authors will now present each model in turn.

2.3.1 Distribution Agreement

In this type of agreement, the bank acts as an intermediary for one or more insurance companies to sell their insurance products. This agreement can either be integrative, where the bankers do the sales, or specialist, where the insurers do the sales to prospect leads provided by private client bankers (Teunissen, 2008).

Usually, the insurer pays a commission to the bank where in turn the bank charges fees to the policyholders. The main advantage to the bank of this agreement is that the operations start forthwith without the need to make major capital investments. Also, the insurer provides product training, marketing and sales training. The disadvantages of this agreement are the lack of flexibility to launch new products and the possibility of differences in the corporate culture (Teunissen, 2008).

The entry of Markets in Financial Instruments Directive II (MIFID II) influenced the business models of banks whereas the entry of Insurance Distribution Directive (IDD) forced insurers to change their business models. These directives are relevant to those banks and insurers which are providing or distributing the product. Hence the bancassurance concept is also affected by both regulations (Riesner & Seidler, 2017).

2.3.1.1 Insurance Distribution Directive (IDD)

The IDD is a replacement of the Insurance Mediation Directive (IMD) to regulate the way insurance products are designed and sold by insurers and insurance intermediaries (European Insurance and Occupational Pensions Authority (EIOPA), 2018). The IDD aims to ensure minimum harmonisation of insurance distribution regulation across the EU. By creating a level playing field when purchasing insurance products, this directive enhances consumer protection and provides effective competition (PWC, 2018).

The IDD introduced new requirements in new areas such as enhanced conduct rules for insurance-based investment products and product oversight and governance (Financial Conduct Authority (FCA), 2018). In a nutshell, this directive includes all the information that should be provided to customers before signing an insurance contract. Specifically, it includes conduct of business and transparency rules that should be imposed on the distributors, as well as the rules and procedures for the distributors when doing cross-border business and the rules for the supervision and sanctioning of insurance distributors in case they breach the provisions of the directive (European Insurance and Occupational Pensions Authority (EIOPA), 2018).

2.3.1.2 Markets in Financial Instruments Directive II (MIFID II)

The major area under MIFID II is product governance where for each product the distributor must define the target customers. Therefore, the European regulators must encourage the distributors to work closely with the manufacturers (KPMG, 2017). To define the target market the European Securities and Markets Authority (ESMA) have put forward five criteria: the client type, the client's knowledge and experience, the client's financial situation and ability to bear losses, the risk tolerance and compatibility of the risk/reward profile of the product with the target market and the client's objectives and needs (PWC, 2017). For reasons of hedging and diversification, a product can be sold outside its intended client base (Catala, 2017).

2.3.2 Strategic Alliance Agreement

Contrary to the distribution agreement, the strategic alliance agreement is an agreement between a bank and one insurance company only. The main advantage of this agreement for the bank is the ability to choose the best insurance company while for the insurer the main advantage is the ability to expand its customer base without increasing the sales or paying agent or broker commissions. (Teunissen, 2008).

2.3.3 Joint Venture Agreement

In the joint venture agreement, the bank and the insurer enter into a partnership agreement and a new entity is formed. The advantages of this agreement include cross selling opportunities and earning additional revenues through commissions. Both the bank and the insurance company have rights based on the decisions taken according to their equity contribution in the new company formed (Clipici & Bolovan, 2012).

2.3.4 Full Integration Agreement

In the full integration agreement, the bank creates its subsidiary. Hence, the bank sells the insurance products under its own name. The disadvantage of this agreement is that the bank needs to make a substantial investment to create the subsidiary. Also, the bank has to provide all the necessary training, IT infrastructure and establish its marketing plan to sell the insurance products (Clipici & Bolovan, 2012).

Bancassurance agreements differ from one country to another. In the US, the distribution agreement is more popular, while in Europe the strategic alliance agreements and the joint venture agreements are the most commonly used. (Teunissen, 2008).

2.3 The Need for Bancassurance

There are several reasons which contribute to the need for bancassurance and hence to the growth of bancassurance. The reasons are:

- **Fee income** – A bank is expected to increase its fee-based income and overall productivity by leveraging its brand image, branch network and client base (Francis, 2014). By acting as a ‘one-stop-shop’ with these value added services, the bank increases the customer’s satisfaction (Alavudeen & KD, 2015).
- **Cost effective** – For the insurance company it is more cost effective since there will be no agency costs (Francis, 2014).
- **Conducive environment** – Due to changes in lifestyle and in culture, the need for bancassurance has increased. Such changes include the use of the internet and the efficiency and effectiveness of technology, the need for private pension plans and the idea of a ‘one-stop-shop’ to provide all financial services from a single location (Sinha, 2005).
- **Innovative and efficient** – When a bank and an insurance company enter into a bancassurance agreement, this leads to an innovative financial service because of the mix of their skills and corporate cultures (Allen, 2018).
- **Fund management** – Investment preferences changed because nowadays, customers prefer to purchase life insurance products or invest in mutual funds rather than depositing in a savings account because the return is higher (Munich Re, 2001). Since purchasing a life insurance product is considered as savings, banks entered into this line of business because of the opportunity to increase its deposits by offering such products. Also, for the bank, selling life and non-life insurance products provides an additional stream of revenue besides the fee income (Teunissen, 2008).

2.4.1 Benefits to the Bank

When a bank gives out a loan to its customers there is a lot of risks involved especially default risk. However, the bank can insure this default risk by entering into a long term strategic alliance with the insurance company, so that the bank would grant a credit insurance policy to the customer (Ghimire, 2013).

In 2008, Corneliu & Ghilimei emphasized that banks mainly generate profits from interest-bearing instruments hence the interest spread, which is the difference between the interest rate that they pay on

deposits and what they charge on loans. However, since insurance products do not generate any interests, the bank can earn additional revenue by generating non-interest income from the selling of the insurance products (Clipici & Bolovan, 2012). Additionally, when banks sell these products they charge a fee mainly for the administration expenses hence they also earn a fee income (Ghimire, 2013).

Through bancassurance, banks have access to a larger product range to sell. Hence, as Kavugwi (2015) stated, the bank is more attractive and customer satisfaction and loyalty increases. According to Bergendahl (1995) any bank that would like to increase its volume and improve efficiency needs to expand its products and services. From the point of view of customers, banks are seen as a 'one-stop shop'. Therefore, thanks to this idea banks increase their network size (Ghimire, 2013).

2.4.2 Benefits to the Insurer

Kumar (2017) argued that as the insurer enters into bancassurance, this expands its customer base without increasing its sales or pay broker's and agent's commissions. When choosing a bank, the customer must have complete confidence in the bank since they are going to trust their money to a third party. Therefore, the insurer is going to benefit from this confidence and the bank's trustworthy image (Ghimire, 2013).

Distribution costs decrease since only one member of personnel needs to be available to sell the insurance products. Also, by using the bank's existing network, the insurer can establish itself more quickly in a new market (Ghimire, 2013).

Constantinescu (2012) argued that due to the partnership with the bank, the insurer increases its efficiency to develop new products. Also, the insurer increases its capital to develop its business.

2.4.3 Benefit to the Customer

The customer is also a stakeholder who benefits from bancassurance. This is because the customer can have access to a variety of products under one roof, hence the concept of a 'one-stop-shop' (Francis, 2014). Customers also benefit from lower premium rates and new products that would not be available had the bank and the insurance company not been working together. Therefore, customer satisfaction increases (Ghimire, 2013).

2.4.4 Benefits to the Regulator

Since the concept of bancassurance is all about the merging of banks with insurance companies, this merger decreases systemic risk. This means that banks benefit from lower income volatility while insurers would increase their capital to maintain solvency capital requirements (SCR) (Corneliu & Ghilime, 2008).

2.5 Bancassurance in Europe

The main type of distribution channel that insurers use is either brokers, agents or bancassurance. The type of distribution channel varies from one country to another because it depends on the customer's needs and preferences as well as on the culture of the country. This ensures better customer satisfaction as well as stimulating competition between providers and distributors in the price and quality of products (Insurance Europe, 2016).

The next section describes the selling of insurance products through the different types of distribution channels in the European market.

2.5.1 Life Insurance Products

As can be seen in Figure 2.1, in 2014 the main type of distribution channel for life insurance products was bancassurance followed by agents, brokers and direct writing. Among the largest life insurance markets, the countries which sold the largest number of insurance products through bancassurance were Italy, which sold 79% of the GWP, followed by France, which sold 64% of the GWP. On the other hand, the country which sold the largest number of insurance products through agents and brokers was the UK, which sold 79% (Insurance Europe, 2018 a).

The other European markets in which bancassurance was the most dominant were Malta which sold 82%, Portugal and Turkey which sold 80% each and Spain, which sold 63%. The market in which both agents and brokers were dominant was Bulgaria, which sold 80%. It is important to note that agents alone were the main distribution channel in Slovenia, which sold 80% and Slovakia, which sold 66% (Insurance Europe, 2018 a).

In the countries mentioned earlier, bancassurance is the most dominant distribution channel because of several reasons. Firstly, when this concept was introduced (in the 1980s), insurance companies had a low penetration ratio while the banking sector held a strong position. Also, it is dominant because the customers benefit from the ‘one-stop-shop’ effect which means a customer can buy several products from a single provider (Clipici & Bolovan, 2012).

In the UK and Germany, the bancassurance concept cannot develop because when this concept was introduced, the insurance sector had a good penetration ratio, hence the insurance sector was strong enough and this new concept didn’t make any difference. Also, countries like the UK have low bank density, thus rendering it difficult to sell insurance products through banks. The reason why bancassurance is rare in countries like Slovakia and Slovenia is because of the slow growth of the life market in these countries (Clipici & Bolovan, 2012).

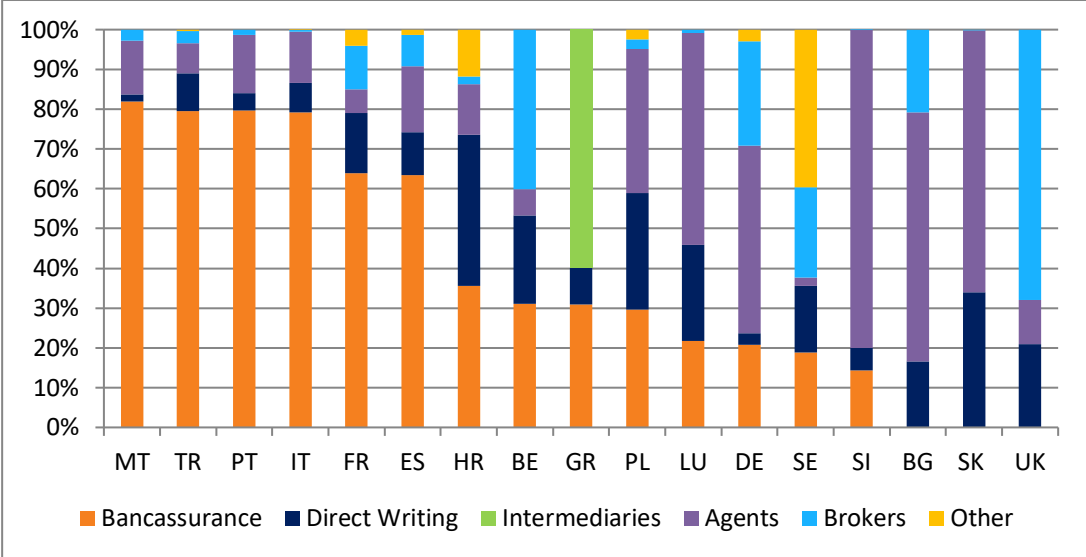


Figure 2.1: Life Distribution Channels (% of GWP) by Country in Europe-2015 (adapted from Insurance Europe, 2018 a)

2.5.2 Non-Life Insurance Products

Irrespective of how large the market is, non-life insurance policies are mainly sold through agents and brokers. As can be seen in Figure 2.2 among all European markets, Italy and Slovakia had sold 79% of non-life insurance products through agents followed by Turkey, which sold 66%, Slovenia, which sold 65%, Poland, which sold 61%, Germany, which sold 59% and Portugal, which sold 54%. On the same line, Belgium, the UK and Bulgaria had sold 61%, 52% and 50%, respectively, through brokers. It is important to note that Croatia was the top country which sold 63% of non-life insurance products directly (Insurance Europe, 2018 a).

Due to changes in customer needs, preferences, regulatory and technological changes, distribution channels are always moving forward. Insurance companies are always trying to innovate by investing in new technologies to exceed the customer’s expectations and sell insurance products which satisfy the customer’s needs and preferences. New EU legislation like the IDD and the Packaged Retail and

Insurance-based Investment Products (PRIIPs) regulation is likely to impact distribution channels (Insurance Europe, 2018 a).

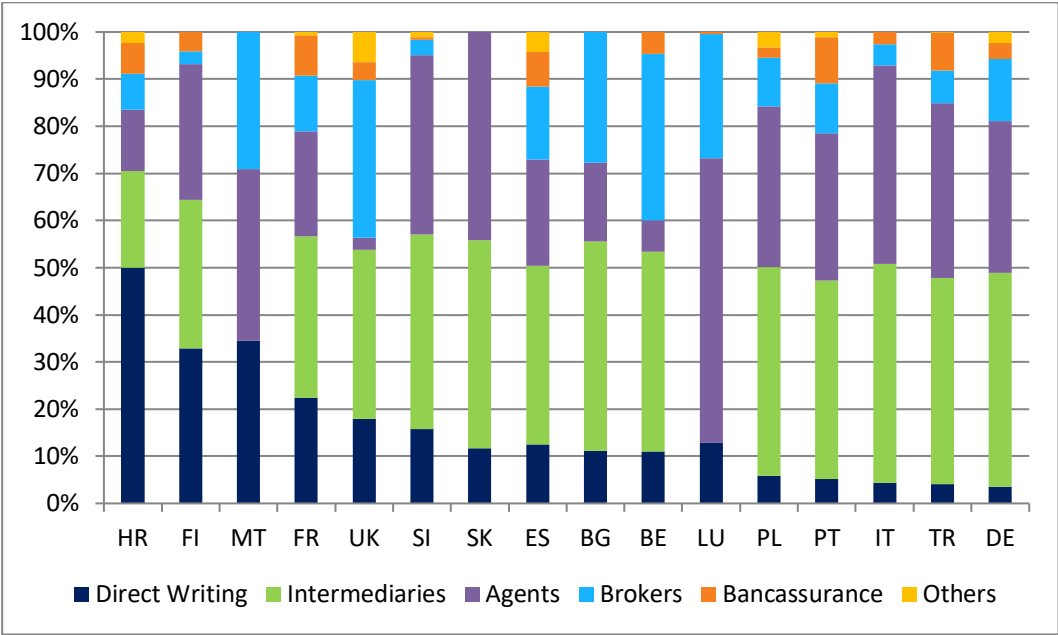


Figure 2.2: Non-Life Distribution Channels (% of GWP) by Country in Europe-2015 (Insurance Europe, 2018 a)

authors2.6.1 History of Bancassurance in Malta

In Malta, bancassurance was first introduced in 1994 with the joint venture of Bank of Valletta (BOV) and Middlesea Insurance. This joint venture led to the creation of a new company namely Middlesea Valletta Life Assurance Co Ltd. The equity of this joint venture was held by Middlesea Insurance which had 51% of the equity, BOV which had 39%, while the remaining 10% were held by Munich Re. In 2005, BOV acquired the 10% equity from Munich Re and 1% from Middlesea Insurance. In 2010, Middlesea Valletta Life Assurance Co Ltd changed its name to MSV Life p.l.c. At this point, all equity of MSV Life was acquired by Mapfre Middlesea and BOV each holding 50% of the equity. In 2016, MSV Life p.l.c. changed its name to MAPFRE MSV Life p.l.c (MAPFRE MSV Life, 2018).

In 1996, Mid-Med Bank formed its own subsidiary with the name of Mid-Med Life Assurance Malta Ltd to start selling life insurance products. In 1999, HSBC bought 70% of Mid-Med Bank equity, hence Mid-Med Life Assurance Ltd changed its name to HSBC Life Assurance Malta Ltd. (HSBC, 2018). APS bank has also entered into bancassurance. In particular it entered into a distribution agreement with MAPFRE MSV Life to start selling life insurance to its clients.

2.6.2 Maltese Legislation on Bancassurance

The Second Banking Directive (89/664/ECC) removed the existing barriers between different sectors of the financial services industry so that a credit institution can sell both financial and insurance products. Hence, this directive eventually changed the bancassurance concept (Ricci, 2011). Since Malta is a member of the EU, it had to transpose this directive into the Maltese laws and regulations.

The local banks are authorised to sell insurance products authorby the MFSA. The banks which act as an intermediary of an insurance company are all regulated under the Insurance Distribution Act, Chapter 487 of the Laws of Malta (Laws of Malta, 2018). On the other hand, the Insurance Business Act 1998 regulates the joint venture model and the full integration model since a new insurance company would have been formed (Laws of Malta, 1981). Under these regulations, local banks can only sell life insurance products. However, in 2006, the MFSA issued a circular entitled ‘Credit and Financial Institutions – General Business Insurance’ stating that these banks can also sell accident, sickness and miscellaneous financial loss insurance when granting a loan to someone (Buttigieg, 2014).

2.7 Perception

Ward, Grinstein & Keim (2015) defined perception as:

The process of recognising (being aware of), organising (gathering and storing), and interpreting (binding to knowledge) sensory information. Perception deals with the human senses that generate signals from the environment through sight, hearing, touch, smell and taste. Vision and audition are the most well understood. Simply put, perception is the process by which we interpret the world around us, forming a mental representation of the environment (p.73).

2.7.1 The Customer Perception Process

Walters & Bergiel (1989) define customer perception as the process where the customer becomes aware of the environment and interprets it in a way that fits into a frame of reference (Hojdik, 2018).

The main aim of a company is to increase its sales and revenues and to understand the customer behaviour by getting to know the customer's needs and the decision process involved in the purchase of products or services (Hojdik, 2018).

Based on the purchasing experience of a product or service, the customer forms opinions on the company hence influencing the customer perception process (Hojdik, 2018). As shown in Figure 2.3, the customer perception process is divided into five stages namely (1) exposure, (2) attention, (3) organisation, (4) interpretation and (5) retention. These stages will enable the customer to take the ultimate decision to purchase the product or service (Mostert, 1996).

2.7.1.1 Exposure

The first stage of the perception process is exposure. This is the recognition of a stimulus which comes within the range of one's senses (Rookes & Willson, 2005). This can either be intentional or accidental exposure. Intentional exposure is the exposure to market related information because of one's personal interests while accidental exposure occurs when one is continuously exposed to marketing campaigns such as advertisements on the internet (Mostert, 1996).

2.7.1.2 Attention

From a marketing perspective, attention is very important to companies. This is because every day, the customers are exposed to marketing stimuli. Hence, if the customers do not pay attention to these marketing stimuli, the message that the company tries to portray becomes pointless (Mostert, 1996).

Aaker et al. (1987) described attention as an information filter because it is a type of mechanism which controls the amount of information that one can receive (Mostert, 1996). There are various factors which determine attention (BBA|MANTRA, n.d.). These are:

1. **Stimulus factors** – These are the physical characteristics of a stimulus (BBA|MANTRA, n.d.).
2. **Size and intensity of the message** – In the perception process, the size of a stimulus has a great impact because it influences attention and recognition. Similarly, the more intense a stimulus is, the higher the probability that it will be perceived. As such, marketers often use intensity to attract the customer's attention (Human Resource Management, 2009).
3. **Situational factors** – These are the external environment and temporary characteristics of an individual. This means that the interpretation of a stimulus can be affected by the location, social context and timing of a stimulus (BBA|MANTRA, n.d.).
4. **Psychological factors** – These are the psychological factors of the individual which include attitudes, moods, motivation, interest and expectations (Bhowmik & Naveed, 2012).
5. **Colour, movement and contrast** – The way the stimulus is presented gets the customer's attention. An individual will get the attention of a stimulus if a stimulus contrasts with its surrounding environment. This can be caused by presenting the stimulus in bright colours (Human Resource Management, 2009).

2.7.1.3 Organisation

According to Gestalt psychology, customers organise stimuli into groups and perceive them as unified wholes (Mostert, 1996). In order to form a picture of the perceptions, customers tend to organise these perceptions into figure and ground relationships. In a marketing perspective, when a company wants to

advertise a product or service, it designs its advertisement into symbols and figures (BBA|MANTRA, n.d.).

2.7.1.4 Interpretation

Schiffman et al. (1991) and Van der Walt (1991) argued that the interpretation stage is different for every individual since it is based on past experiences. Mowen (1993) added that the interpretation of a stimulus is retrieved from long-term memory and due to different expectations, different interpretations of the same stimulus can exist (Mostert, 1996).

The interpretation stage is made up of two principles: categorisation and inference. The categorisation principle helps the customer to process known information quickly and efficiently and to classify new information accordingly, while the inference principle is the development of an association between two stimuli (Mostert, 1996).

2.7.1.5 Retention

In order for the customer perception process to be successful, the customer needs to develop all of this process into a memory which can be recalled when necessary. Since customers are continuously exposed to a lot of marketing stimuli, there is a tendency to forget most of them. Hence, in order to retain these marketing stimuli, the message that the company wants to portray must be continuously repeated otherwise it will be futile (Fripp, n.d.).

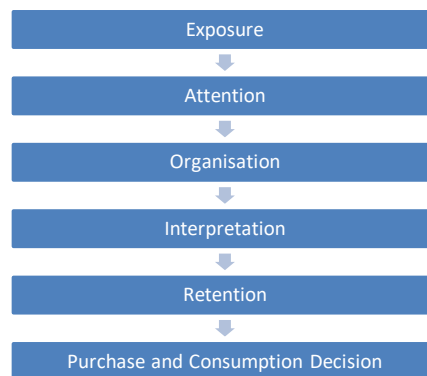


Figure 2.3: Customer Perception Process adapted from (BBA|MANTRA, n.d.)

2.7.2 The Customer Perception Theory

Customers have their own perception of a product or service. customer perception theory is about analysing the customer's behaviour and understanding the reason(s) for purchasing products or services (Blank, n.d.).

When studying customer perception theory, the authors tried to understand what motivates the customer to take such decisions and how these decisions are influenced by them. Usually, companies use this theory to enhance their internal strategies (mainly marketing and advertising strategies) and to attract new customers (Flamand, 2017).

Ndubisi (2003) argued that a company has a social responsibility to provide the goods and services which satisfy the customers requirements and in turn customers present ideas, opportunities and money amongst others. Once the customers present their needs and wants the company will satisfy such needs by providing them with an adequate products or services and if the company does not meet these needs, it will lead to customer dissatisfaction (Ndubisi, 2003).

In their studies, Flint, Woodruff & Gardial (1997) proposed that in order to compete, companies need to understand the changes in the customer's perception values. Therefore, companies must come up with strategies to maintain their competitive advantage and retain their current customers.

The Customer Perception Theory is divided into three:

1. Self-Perception
2. Price Perception

3. Benefit/Risk Perception

2.7.2.1 Self-Perception Theory

Self-perception theory was first introduced in 1965 by Psychologist Daryl Bem. Bem (1967) proposed that the self-perception theory is an alternative to the cognitive dissonance theory which was proposed by Leon Festinger. According to Bem (1967), provided that an attitude has not yet occurred, people develop a new attitude by observing their own behaviour and hence, conclude what attitudes must have caused this behaviour (Bem, 1967).

This theory is mainly used for psychological therapy and in marketing to persuade customers.

2.7.2.1.1 Psychological Therapy

In psychological therapy, self-perception theory suggests that the individual's inner feelings are derived from their external behaviours. If these external behaviours are abnormal, people will engage these abnormalities to their poor abilities and hence suffer from psychological problems. Therefore, self-perception theory can be used to help those who have psychological problems arising from any abnormality by first teaching them to change their behaviour and then how to deal with the problem (Bem, 1972).

2.7.2.1.2 Marketing

Self-perception theory is also used as a marketing tool to persuade customers. The most widely used technique is the foot-in-the-door technique. The idea of this technique is to convince a customer to agree to something small, which eventually will lead the customer to persuade himself/herself to agree to the larger request that the company had in mind. The idea of this technique is that by persuading the customer on a small request, he/she will change his/her own mind and agree on a larger request. Hence, by observing a customer's behaviour, the purchasing of a product or service may result (Snyder & Cunningham, 1975).

2.7.2.2 Price Perception Theory

Price perception theory determines the customer's perception of whether one was charged a fair price or not when purchasing a product. It includes the quality of the product or service that the company is offering and the ability to compare a company's prices with other companies. It also includes the customer's satisfaction upon purchasing the product and whether they would purchase further products (Blank, n.d.).

Janiszewski & Lichtenstein (1999) argued that price perception is all about the customer's attraction to a price. They also added that customers are attracted to a price if they are able to compare the price with an internal reference price. The attractiveness of a price may also depend on the ability to compare a price to the endpoints of the recalled price change. In a study carried out by Janiszewski and Lichtenstein (1999), it was shown that changes in the context can bring about changes to the recalled price range which eventually will lead to a change in the perception of the price.

2.7.2.3 Risk/Benefit Perception Theory

The aim of a company is to convince the customer that the product or is right and adequate for them. Hence, the company increases its sales and revenues. However, customers tend to reject unsupported claims and often like to seek further information on the products or services that they are considering purchasing (Blank, n.d.).

2.7.2.3.1 The Benefits of the Customer Perception Theory for Business

The perception of a product or service of the company might be different from that of the customer. Due to an increase in competition, companies might face a challenge in differentiating their products or services from that of other companies. Therefore, to attract customers, companies would end up lowering their prices along with minimising the product differences (iResearch Services, 2018). Nowadays, customers are constantly seeking branded products and discounts. Through the internet, customers can compare prices more easily and their awareness and expectations have increased. This

has put companies in a challenging position as they need to sort their products by quality, price and function (iResearch Services, 2018).

Therefore, to solve this problem, companies must form a strong relationship with the customer. The better the relationship a company has with its customers, the more likely the customer would purchase other products or services from that company. However, if there is a weak relationship, arising from a single transaction, it is likely that the customer would not return back to make another transaction. Therefore, the main aim of a company is to convince the customer to purchase their products or services from them as they would lose out on benefits when buying the competitor's products or services (iResearch Services, 2018).

Throughout the years, the bancassurance concept has been continually expanding. Although bancassurance in Malta is on the increase (Insurance Europe, 2018 b), there are factors which are influencing the Maltese people's perception of the purchase of bancassurance (Bugeja, 2017).

3.0 Methodology

3.1 Data Collection Method

According to Yin (2002), in order to answer the research question, data analysis must be all about examining, categorising, tabulating, testing or combining quantitative and qualitative data. On the other hand Stake (1995) argues that data analysis is a matter of giving meaning to first impressions as well as to final compilations (Stake, 1995).

A researcher can use various ways to collect information from respondents. For the purpose of this research, the authors used a mix approach and constructed a questionnaire to conduct a survey amongst Maltese nationals.

To carry out the survey, the authors created a number of demographic questions to gain an idea of who the respondents were. The demographic section included a question about the gender, whereby participants were asked to choose between males, females, other or prefer not to say. The participants had to state their age by choosing from five different age brackets, namely 18-24 years old, 25-34 years old, 35-44 years old, 45-54 years old, 55-64 years old and 65+ years old. Another question required the participants to state whether they had ever heard the term 'bancassurance' before. If in the affirmative, they were asked to identify the source, choosing from media, friends/relatives, bank personnel, agents/brokers/intermediaries, school, work or other. The last question was whether the participants are bancassurance clients or not.

The authors divided the questionnaire into three sections namely-perception, price perception and benefit/risk perception. Under each section, five different statements were created.

Under the self-perception section, the statements were:

1. "Advertisements on the TV, radio and social media motivate me to purchase insurance products from banks."
2. "I have good trust in my bank therefore I might buy insurance products that the bank will offer."
3. "I will buy insurance products from my bank because the bank better understands my needs and financial position."
4. "I will only buy insurance products from the bank if the bank obliges me to do so (when taking out a home loan, for instance, the bank obliges you to purchase life insurance for the term of the loan) otherwise I am not going to buy insurance products from the bank."
5. "I prefer to buy insurance products from the bank because of its brand image and it is well known."

Under the price perception section, the statements were:

1. "I think that the premium charged for purchasing an insurance product, such as life insurance or set up a private pension plan, is fair and reasonable."
2. "I think it is economical to purchase insurance products through banks."
3. "I think that costs are reduced when buying insurance products through banks."

4. "I will buy insurance products from banks because I am satisfied with the bank's services."
5. "I think that the processing time to purchase an insurance product from a bank is quick and efficient."

Under the benefit/risk perception, the statements were:

1. "I think it is convenient to purchase insurance products from banks."
2. "The idea that I will have access to both financial products and insurance products from one institution only (one-stop-shop) motivates me to purchase such products from banks because it will save me time."
3. "I think that through bancassurance, the process of a claim settlement takes too long."
4. "Setting up a private pension plan gives me peace of mind that after retirement I will have enough money to live."
5. "Purchasing life insurance gives me peace of mind that if I die my dependents will have financial protection."

For these statements, the authors used a five point Likert scale '1'- being strongly disagree, '2' being disagree, '3' being neither disagree or agree, '4' being agree and '5' being strongly agree. The participants had to rate the above statements according to their level of agreement.

The authors opted for a five point Likert scale because it does not simply expect participants to answer yes or no. Rather it allows participants to express both the direction and strength of their opinion about a topic (Garland, 1991). However, the validity of a Likert scale can be reduced due to social desirability where the participants do not answer truthfully (McLeod, 2008).

At the end of the questionnaire, the authors included a comment box to allow the participants to express themselves by writing any additional comments.

3.2 Sampling Strategy

According to Suresh et al. (2011), the main purpose of sampling is to ensure that the sample group represents the target population without any errors. Since this study is done on the perception of Maltese nationals on bancassurance, the whole population taken into consideration was Maltese nationals, which amounts to 475,000 people. Hence, using Raosoft a sample size calculator with a margin error of 5%, 95% confidence level and a population size of 475,000, the sample size calculator recommended a minimum sample size of 384.

In order to obtain a sample of the Maltese population, the authors used probability sampling. Maltese nationals were randomly selected meaning that every national had an equal chance of being selected and participating in the survey (Saunders et al., 2009). Gravetter & Forzano (2018) stated that the logic behind simple random sampling is that it removes bias from the selection procedure and should result in a representative sample (Gravetter & Forzano, 2018).

The survey was created on SurveyMonkey® and was shared through Facebook where 192 participants had been invited to fill in the survey online. They were also asked to invite others. The remaining 192 surveys were printed as a hard copy and were distributed randomly to Maltese nationals.

3.3 Tools for the Data Collection Method

After the questionnaires were filled in by the participants, the authors used IBM SPSS version 25 to input the participants' data and analyse their respective answers. To analyse the data, the authors used descriptive statistics, the Kruskal-Wallis test and a thematic approach as suggested by Braun et al. (2006).

3.3.1 Descriptive Statistics

To indicate the centre of distribution, the authors used the arithmetic mean (M). As pointed out earlier, the scale used for this research ranges from 1 to 5. Hence, in order to establish in which range the arithmetic mean falls (Table 3.1), the mean value range for each statement was calculated using the equation:

$$\text{Mean Value Range} = \frac{\text{Range Value}}{\text{Number of Classes}}$$

Range	Interpretation
1.00 – 1.80	Strongly Disagree
1.81 – 2.60	Disagree
2.61 – 3.40	Neither Disagree nor Agree
3.41 – 4.20	Agree
4.21 – 5.00	Strongly Agree

Table 3.1: The midpoints of the five point Likert scale

Therefore, by identifying the range in which the arithmetic mean falls, the authors was able to determine the respondent’s level of agreement. The authors first analysed the arithmetic mean for the whole population. Then, they analysed how the arithmetic mean changed according to the demographics.

3.3.2 Kruskal-Wallis Test

The Kruskal-Wallis Test (sometimes also called “one-way ANOVA on ranks”) is a non-parametric test used to determine if there are statistically significant differences between the groups of each demographic in terms of their answer to questions. In order to carry out this test, the authors assumed that the observations are independent of one another, the measurement scale for the dependent variable is ordinal and the samples are randomly chosen (Goldstein, 2012).

In order to use the Kruskal-Wallis Test, the authors created the null and alternative hypotheses. The null hypothesis is that the distribution of Statement 2.1, 2.2, 2.3, 2.4, 2.5, 3.1, 3.2, 3.3, 3.4, 3.5, 4.1, 4.2, 4.3, 4.4 and 4.5 is the same across categories of Questions 1.1, 1.2, 1.3 and 1.5.

On the other hand, the alternative hypothesis is that the distribution of Statements 2.1, 2.2, 2.3, 2.4, 2.5, 3.1, 3.2, 3.3, 3.4, 3.5, 4.1, 4.2, 4.3, 4.4 and 4.5 is not the same across categories of Questions 1.1, 1.2, 1.3 and 1.5.

The null hypothesis for each statement will be accepted if the p-value exceeds the level of significance ($\alpha=0.05$). If the p-value is less than the significance level ($\alpha=0.05$), the null hypothesis will be rejected.

3.3.3 Thematic Approach

The thematic approach was used to analyse the data collected from the comment boxes by categorising them into themes and analysing them accordingly. Braun et al. (2014) consider thematic analysis as a method used in qualitative data to identify, analyse and interpret themes.

4. Results, Findings & Analysis

4.1 Demographics

A total sample of 384 surveys was collected amongst Maltese nationals which is a representative sample of the whole population, i.e., 475,000 nationals. The majority of the participants (69.53%) were females whereas 29.95% were males. Just over half of a percentage (0.52%) declared their gender as ‘Other’.

The highest number of participants were within the age group 18-24 years old which amounted to 34.11% of the whole population. This was followed by the age group 35-44 years old (22.14%), 25-34 years old (20.31%), 45-54 years old (13.80%), 55-64 years old (6.51%) and 65+ (3.13%) respectively.

The majority (59.64%) of the Maltese nationals in this study had not heard about the term 'bancassurance'. Only 40.36% of the whole population declared that they heard about the term 'bancassurance'.

38.14% of the participants who had heard about the term 'bancassurance' had done so from bank personnel. This was followed by the media (26.29%), school (15.98%), agents/brokers/intermediaries (9.79%) and friends/relatives (7.22%) respectively. There were 2.58% of the participants who declared that they had heard about the term 'bancassurance' from their workplace.

The majority of the population (82.03%) are not bancassurance clients. In fact, only 17.97% are bancassurance clients. This could be the reason for the lack of knowledge on bancassurance which, as stated earlier, was high amongst participants (59.64% of the population declared that they had never heard about the term 'bancassurance').

4.2 Self-Perception

We have seen above that self-perception can be used as a marketing tool to persuade customers to purchase a product or service by observing their behaviour (Snyder & Cunningham, 1975). Under this section, the authors were concerned with factors that motivate the customer to purchase insurance products from banks. These include advertisements, trust, the bank's understanding of client needs and financial position, obligation, the bank's brand image and the fact that it is well known.

a) Advertisements

Descriptive statistics revealed that the participants were uncertain ($M=2.78$) about whether or not advertisements motivate them to purchase insurance products from banks. The result remained the same amongst the genders (males; $M=2.73$, females; $M=2.80$, other; $M=3.00$), amongst those who had heard about the term 'bancassurance' ($M=2.90$) and those who had not ($M=2.69$) and between those who are bancassurance clients ($M=2.97$) and those who are not ($M=2.74$).

However, analysing the mean between the different age brackets shows that those aged between 55-64 years old ($M=2.56$) and over 65 years old ($M=2.50$) disagreed that advertisements motivate them to purchase insurance products from banks. The remaining age brackets; 18-24 years old ($M=2.82$), 25-34 years old ($M=2.73$), 35-44 years old ($M=2.91$) and 45-54 years old ($M=2.70$) were uncertain. In Chapter 2 (Section 2.8.1.2), it was argued that if a customer does not pay attention to a marketing stimulus, the message that the company tries to portray becomes pointless (Mostert, 1996). This agrees with the descriptive statistics results since the participants are either uncertain or disagree with the statement that advertisements motivate them to purchase insurance products from banks.

b) Participant's Trust on Banks

Participants agreed that they trust their respective banks and hence they might purchase insurance products from them ($M=3.46$). In fact, research has shown that in order to purchase a product or service from the bank, the customer must have complete confidence in the bank since they are going to trust their money to a third party (Ghimire, 2013).

Analysing the mean between the genders shows that males ($M=3.27$) and others (3.00) were uncertain while females ($M=3.55$) agreed that they might purchase insurance products based on their trust in the bank. Descriptive statistics between the age brackets revealed that those aged between 18-24 years old ($M=3.31$) and between 55-64 years old ($M=2.92$) were uncertain while those aged between 25-34 years old ($M=3.49$), between 35-44 years old ($M=3.72$), between 45-54 years old ($M=3.64$) and over 65 years old ($M=3.50$) agreed that they have trust in banks meaning that they might purchase insurance products from them.

The mean between those who heard about the term 'bancassurance' ($M=3.51$) and those who didn't ($M=3.43$) remained the same as the whole population. The participants who are bancassurance clients ($M=3.77$) agreed with the whole population whereas those who are not bancassurance clients ($M=3.39$) were uncertain about whether they would purchase insurance products from banks based on their trust in the bank.

c) Bank's Understanding of one's own needs and financial position

Fields et al (2007b) argued that banks have more up-to-date client information since they provide services to their customers directly. This means that banks are better at understanding the customer's needs and financial position. However, descriptive statistics revealed that participants were uncertain about whether they would purchase insurance products from their bank because the bank has a better understanding of their needs and financial position (M=3.24). Almost across all demographic questions, the result remained the same. However, the mean changed between those who are bancassurance clients (M=3.58) agreeing to purchase insurance products from their bank because the bank better understands their needs and financial position. This corroborates the findings presented by Fields et al (2007b).

d) Obligation

Participants were uncertain about whether they would only purchase insurance products from the bank if the bank obliges them to do so (M=3.35). Analysing the mean between the genders, males (M=3.37) and females (M=3.34) agreed with the whole population. However, others (M=4.00) agreed to statement 2.4 i.e., that they will only purchase insurance products from banks if they are obliged to do so. Participants aged between 18-24 years old (M=3.40), between 45-54 years old (M=3.08), between 55-64 years old (M=3.20) and over 65 years old (M=3.17) were uncertain about statement 2.4. However, those aged between 25-34 years old (M=3.46) and between 35-44 years old (M=3.41) agreed that they would only purchase insurance products from the bank if the bank obliges them to do so. Both those participants who heard about the term 'bancassurance' (M=3.28) and those who had not (M=3.40) were uncertain about statement 2.4. This also applies to those who are bancassurance clients (M=3.39) and those who are not (M=3.39).

e) Bank's brand image and well-known

Descriptive statistics revealed that participants agreed that they were uncertain about whether they would purchase insurance products from their banks based on the bank's brand image and the fact that it is well known (M=3.10). The results remained the same amongst the genders (males; M=3.09, females; M=3.11, other; M=3.00), the age brackets (18-24; M=2.89, 25-34; M=3.22, 35-44; M=3.22, 45-54; M=3.38, 55-64; M=2.84, 65+; M=3.17), between those who had heard about the term 'bancassurance' (M=3.17) and those who had not (M=3.05) and between those who are bancassurance clients (M=3.32) and those who are not (M=3.05).

4.3. Price Perception

As stated above, it was argued that price perception is all about the customer's attraction to a price (Janiszewski & Lichtenstein, 1999). Under this section, the statements related to the premium in whether it is economical to purchase insurance products from banks, costs, satisfaction and the processing time to purchase.

a) Premium

Studies have shown that through bancassurance, customers benefit from lower premium rates (Ghimire, 2013). However, descriptive statistics revealed that the participants were uncertain on whether the premium charged on insurance products is fair and reasonable (M=3.05). The result remained the same across genders (males; M=3.00, females; M=3.07, other; M=3.00), ages (18-24; M=3.01, 25-34; M=3.23, 35-44; M=3.11, 45-54; M=2.98, 55-64; M=2.64, 65+; M=3.08), between those who had heard about the term 'bancassurance' (M=3.12) and those who had not (M=3.00) and between those who are bancassurance clients (M=3.23) and those who are not (M=3.01).

b) Economical

Participants do not know whether purchasing insurance products from banks is economical or not (M=3.07). The result remained the same across genders (males; M=3.04, females; M=3.09, other; M=3.00), ages (18-24; M=3.10, 25-34; M=3.12, 35-44; M=3.05, 45-54; M=3.11, 55-64; M=2.72, 65+; M=3.25), between those who had heard about the term 'bancassurance' (M=3.14) and those who had not (M=3.03) and between those who are bancassurance clients (M=3.26) and those who are not (M=3.03).

c) Costs

Descriptive statistics showed that the participants do not know whether costs are reduced when purchasing insurance from banks (M=2.88). There weren't any changes in the results between the

genders (males; M=2.94, females; M=2.85, other; M=3.00), ages (18-24; M=2.98, 25-34; M=2.90, 35-44; M=2.80, 45-54; M=3.00, 55-64; M=2.72, 65+; M=3.08), between those who had heard about the term 'bancassurance' (M=2.92) and those who had not (M=2.85) and between those who are bancassurance clients (M=2.88) and those who are not (M=2.88). However, research has shown that when a customer purchases an insurance product from a bank rather than from an insurer, the distribution costs will decrease (Ghimire, 2013).

d) Satisfaction

Blank (n.d.) argued that price perception is also about customer satisfaction upon purchasing the product. Descriptive statistics revealed that the participants were uncertain about whether their satisfaction with the bank's services motivates them to purchase insurance products from them (M=3.35). The mean result between the genders remained the same (males; M=3.30, females; M=3.38, other; M=3.00).

Participants aged between 25-34 years old (M=3.44), 35-44 (M=3.44) and between 45-54 years old (M=3.55) agreed to statement 3.4 i.e., that they would purchase insurance products from banks because they are satisfied with the bank's services. On the other hand, participants aged between 18-24 years old (M=3.24), between 55-64 years old (M=3.00) and over 65 years old (M=3.33) were uncertain. Both the participants who had heard about the term 'bancassurance' (M=3.39) and those who had not (M=3.33) were uncertain about whether they would purchase insurance products based on their satisfaction with the bank's services.

Kavugwi (2015) stated that since a bank has access to a larger product range to sell, customers will be more attractive to a bank and hence customer satisfaction will increase. This is in line with the participants who are bancassurance clients since they agreed (M=3.61) to statement 3.4 whereas those who are not bancassurance clients stated that they were uncertain (M=3.30).

e) Quick and efficient processing time

Research has shown that in order to increase efficiency, a bank needs to expand its products and services, by instance, selling insurance products (Bergendahl, 1995). However, participants were uncertain (M=3.29) about whether the processing time to purchase an insurance product from a bank is quick and efficient. Both males (M=3.17) and females (M=3.34) were uncertain whereas, others (M=3.50) agreed that the processing time is quick and efficient.

Participants aged between 25-34 years old (M=3.42) and between 35-44 years old (M=3.47) agreed that the processing time is quick and efficient. On the other hand, participants aged between 18-24 years old (M=3.18), between 45-54 years old (M=3.19), between 55-64 years old (M=3.12) and over 65 years old (M=3.08) were uncertain. Descriptive statistics revealed that participants who had heard about the term 'bancassurance' agreed (M=3.41) that the processing time is quick and efficient while those who had never heard about the term 'bancassurance' were uncertain (M=3.21). Participants who are bancassurance clients agreed (M=3.54) to this statement, whereas those who are not bancassurance clients were uncertain (M=3.23).

4.3.1.3 Benefit/Risk Perception

As noted above, the aim of a company is to convince the customer that the product or service that they are willing to purchase is right and adequate for them (Blank, n.d.). Under this section, the statements deal with the benefits or risk that the customer faces when purchasing insurance products from banks.

a) Convenience

Descriptive statistics revealed that participants agreed (M=3.53) that it is convenient to purchase insurance products from banks. Both males (M=3.54) and females (M=3.52) agreed to this statement. However, others (M=3.00) were uncertain.

Participants aged between 18-24 years old (M=3.51), between 25-34 years old (M=3.59), between 35-44 years old (M=3.54), between 45-54 years old (M=3.53) and over 65 years old (M=3.50) agreed that it is convenient to purchase insurance products from banks whereas those aged between 55-64 years old (M=3.36) were uncertain. Both participants who had heard about the term 'bancassurance' (M=3.62) and those who had not (M=3.46) agreed that it is convenient to purchase insurance products from banks. This also applies to those who are bancassurance clients (M=3.83) and those who are not (M=3.46).

b) One-Stop-Shop

Participants agreed that the idea of having access to both financial and insurance products from one institution only motivates them to purchase insurance products from banks because it saves them time (M=3.79). In fact, studies have shown that by acting as a 'one-stop-shop', a bank increases its customer satisfaction (Alavudeen & KD, 2015) while the customer benefits from having access to a variety of products under one roof (Sinha, 2005).

Males (M=3.80) and females (M=3.79) agreed to this statement whereas others (M=3.00) were uncertain. Analysing the mean between the different age brackets revealed that only those aged between 55-64 years old (M=3.36) were uncertain whereas the other age brackets (18-24; M=3.73, 25-34; M=3.87, 35-44; M=3.86, 45-54; M=3.98, 65+; M=3.42) agreed that the idea of having access to both financial and insurance products from just one institution motivates them to purchase insurance products from banks. Both participants who had heard about the term 'bancassurance' (M=3.90) and those who had not (M=3.71) agreed to this statement. Also, both participants who are bancassurance clients (M=4.16) and those who are not (M=3.70) have agreed that the idea of a one-stop-shop motivates them to purchase insurance products from banks.

c) The process of a claim takes too long

Descriptive statistics revealed that participants were uncertain (M=3.16) about whether the time for a claim to be settled is long through the bank. Males (M=3.17) and females (M=3.15) agreed with the whole population. However, others (M=3.50) agreed to Statement 4.3, i.e., that a claim settlement takes long. Participants across all ages were uncertain to Statement 4.3 (18-24; M=3.13, 25-34; M=3.22, 35-44; M=3.18, 45-54; M=3.09, 55-64; M=3.20, 65+; M=3.17). This is also applicable to those who had heard about the term 'bancassurance' (M=3.19) and those who had not (M=3.14) and to those who are bancassurance clients (M=3.17) and those who are not (M=3.16).

d) Setting up a private pension plan

Studies have shown that changes in lifestyle and in culture have led to an increase in the need for a private pension plan (Sinha, 2005). In fact, participants agreed that setting up a private pension plan gives them peace of mind that when they retire, they will have enough money to live (M=3.72). There weren't any changes between the genders (males; M=3.59, females; M=3.78 and others; M=4.00), the ages (18-24; M=3.89, 25-34; M=3.81, 35-44; M=3.53, 45-54; M=3.53, 55-64; M=3.68, 65+; M=3.75), between those who had heard about the term 'bancassurance' (M=3.65) and those who had not (M=3.77) or between those who are bancassurance clients (M=3.51) and those who are not (M=3.77).

e) Purchasing Life Insurance

Participants agreed that purchasing life insurance gives them peace of mind that if they die, their dependents will be financially protected (M=3.88). There weren't any changes between the genders (males; M=3.83, females; M=3.90, others; M=4.00), the ages (18-24; M=3.95, 25-34; M=3.96, 35-44; M=3.94, 45-54; M=3.68, 55-64; M=3.64, 65+; M=3.58), between those who had heard about the term 'bancassurance' (M=3.87) and those who had not (M=3.89) or between those who are bancassurance clients (M=4.01) and those who are not (M=3.85). In fact, these results corroborate those presented by Munich Re (2001) who revealed that nowadays customers prefer to purchase life insurance products rather than depositing money in a savings account (Munich Re, 2001).

4.4 Kruskal-Wallis Test

The Kruskal-Wallis test (also called "one-way ANOVA on ranks") is a non-parametric test used to determine if there are statistically significant differences between the groups of each demographic section for each statement.

The null hypothesis for each statement will be accepted if the p-value exceeds the level of significance ($\alpha=0.05$). Otherwise, the null hypothesis will be rejected.

(a) Genders

The authors compared the genders (Q1.1) for each statement where Table 4.1 shows the results obtained from the Kruskal-Wallis test. Since the p-value for all the statements except for statements 2.2 and 2.3 is greater than the significance level ($\alpha=0.05$), the authors did not reject the null hypothesis. This means that there is no statistically significant difference in the groups representing the genders. Therefore, one must conclude that gender does not influence the customer's perception of bancassurance.

On the other hand, since statement 2.2 and statement 2.3 have a p-value of 0.025 and 0.049 respectively, which is less than the significance level ($\alpha=0.05$), the authors rejected the null hypothesis for these

statements. This means that there is a statistically significant difference in the groups representing gender. Therefore, one must conclude that gender does influence the customer’s perception as to whether one would purchase insurance products based on the trust one has in the bank (statement 2.2) and whether one would purchase insurance products because the bank better understands their needs and financial position (statement 2.3).

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
1	The distribution of Statement 2.1 is the same across categories of Gender.	Independent-Samples Kruskal-Wallis Test	.723	Retain the null hypothesis.
2	The distribution of Statement 2.2 is the same across categories of Gender.	Independent-Samples Kruskal-Wallis Test	.025	Reject the null hypothesis.
3	The distribution of Statement 2.3 is the same across categories of Gender.	Independent-Samples Kruskal-Wallis Test	.049	Reject the null hypothesis.
4	The distribution of Statement 2.4 is the same across categories of Gender.	Independent-Samples Kruskal-Wallis Test	.617	Retain the null hypothesis.

5	The distribution of Statement 2.5 is the same across categories of Gender.	Independent-Samples Kruskal-Wallis Test	.986	Retain the null hypothesis.
6	The distribution of Statement 3.1 is the same across categories of Gender.	Independent-Samples Kruskal-Wallis Test	.755	Retain the null hypothesis.
7	The distribution of Statement 3.2 is the same across categories of Gender.	Independent-Samples Kruskal-Wallis Test	.930	Retain the null hypothesis.
8	The distribution of Statement 3.3 is the same across categories of Gender.	Independent-Samples Kruskal-Wallis Test	.509	Retain the null hypothesis.
9	The distribution of Statement 3.4 is the same across categories of Gender.	Independent-Samples Kruskal-Wallis Test	.600	Retain the null hypothesis.
10	The distribution of Statement 3.5 is the same across categories of Gender.	Independent-Samples Kruskal-Wallis Test	.215	Retain the null hypothesis.
11	The distribution of Statement 4.1 is the same across categories of Gender.	Independent-Samples Kruskal-Wallis Test	.701	Retain the null hypothesis.
12	The distribution of Statement 4.2 is the same across categories of Gender.	Independent-Samples Kruskal-Wallis Test	.576	Retain the null hypothesis.
13	The distribution of Statement 4.3 is the same across categories of Gender.	Independent-Samples Kruskal-Wallis Test	.592	Retain the null hypothesis.
14	The distribution of Statement 4.4 is the same across categories of Gender.	Independent-Samples Kruskal-Wallis Test	.159	Retain the null hypothesis.
15	The distribution of Statement 4.5 is the same across categories of Gender.	Independent-Samples Kruskal-Wallis Test	.789	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Table 4.1: Kruskal-Wallis test. Results (authors' compilation)

(b) Age

The authors also compared the age (Q1.2) for each statement where Table 4.2 shows the results obtained from the Kruskal-Wallis test. Since the p-value for all the statements except to Statements 2.2, 2.3, 2.5, 3.5 and 4.4 is greater than the significance level ($\alpha=0.05$), the authors did not reject the null hypothesis.

This means that there is no statistically significant difference in the groups representing age. Therefore, one must conclude that age does not influence the customer’s perception of bancassurance. On the other hand since Statements 2.2, 2.3, 2.5, 3.5 and 4.4 have a p-value of 0.01, 0.047, 0.015, 0.026 and 0.039 respectively, which are less than the significance level ($\alpha=0.05$), the authors rejected the null hypothesis for these statements. This means that there is a statistically significant difference in the groups representing age. Therefore, one must conclude that the age does influence the customer’s perception as to whether they would purchase insurance products based on the trust they have in their bank (statement 2.2) as well as based on the fact that the bank will better understand their own needs and financial position (statement 2.3). Age also influences the customer’s perception as to whether they would purchase insurance products based on the bank’s brand image and the fact that the bank is well known (statement 2.5) and whether the processing time to purchase an insurance product from a bank is quick and efficient (statement 3.5). It was also concluded that age does influence the customer’s perception as to whether they would set up a private pension plan to have peace of mind that when they retire (statement 4.4).

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
1	The distribution of Statement 2.1 is the same across categories of Age.	Independent-Samples Kruskal-Wallis Test	.569	Retain the null hypothesis.
2	The distribution of Statement 2.2 is the same across categories of Age.	Independent-Samples Kruskal-Wallis Test	.001	Reject the null hypothesis.
3	The distribution of Statement 2.3 is the same across categories of Age.	Independent-Samples Kruskal-Wallis Test	.047	Reject the null hypothesis.
4	The distribution of Statement 2.4 is the same across categories of Age.	Independent-Samples Kruskal-Wallis Test	.438	Retain the null hypothesis.
5	The distribution of Statement 2.5 is the same across categories of Age.	Independent-Samples Kruskal-Wallis Test	.015	Reject the null hypothesis.
6	The distribution of Statement 3.1 is the same across categories of Age.	Independent-Samples Kruskal-Wallis Test	.074	Retain the null hypothesis.
7	The distribution of Statement 3.2 is the same across categories of Age.	Independent-Samples Kruskal-Wallis Test	.513	Retain the null hypothesis.
8	The distribution of Statement 3.3 is the same across categories of Age.	Independent-Samples Kruskal-Wallis Test	.645	Retain the null hypothesis.

9	The distribution of Statement 3.4 is the same across categories of Age.	Independent-Samples Kruskal-Wallis Test	.161	Retain the null hypothesis.
10	The distribution of Statement 3.5 is the same across categories of Age.	Independent-Samples Kruskal-Wallis Test	.026	Reject the null hypothesis.
11	The distribution of Statement 4.1 is the same across categories of Age.	Independent-Samples Kruskal-Wallis Test	.942	Retain the null hypothesis.
12	The distribution of Statement 4.2 is the same across categories of Age.	Independent-Samples Kruskal-Wallis Test	.111	Retain the null hypothesis.
13	The distribution of Statement 4.3 is the same across categories of Age.	Independent-Samples Kruskal-Wallis Test	.875	Retain the null hypothesis.
14	The distribution of Statement 4.4 is the same across categories of Age.	Independent-Samples Kruskal-Wallis Test	.039	Reject the null hypothesis.
15	The distribution of Statement 4.5 is the same across categories of Age.	Independent-Samples Kruskal-Wallis Test	.217	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Table 4. 2: Kruskal-Wallis test. Results (authors' compilation)

(c) The extent to which participants heard about the term 'bancassurance'

The Kruskal-Wallis test was also used to compare the participants who had heard about the term 'bancassurance' and those who had not (Q1.3), for each statement. Table 4.3 shows the results obtained from the Kruskal-Wallis test. The null hypothesis for all the statements except statements 2.3, 3.5, 4.1 and 4.2 were not rejected. This is because the p-value was greater than the significance level ($\alpha=0.05$). Hence, this means that there is no statistically significant difference between the groups who had heard about the term 'bancassurance' and those who had not. Hence, the extent to which one has ever heard about the term 'bancassurance' does not influence the customer's perception of bancassurance.

The p-values for statements 2.3 ($p=0.035$), 3.5 ($p=0.014$), 4.1 ($p=0.044$) and 4.2 ($p=0.023$) are less than the significance level ($\alpha=0.05$) hence, the null hypothesis was rejected. Therefore, there is a statistically significant difference in the groups in terms of whether the term 'bancassurance' was ever heard or not. Hence, one must conclude that the extent to which one has ever heard about the term 'bancassurance' does influence the customer's perception as to whether they would purchase insurance products from banks based on the fact that the bank will better understand their needs and financial position (statement 2.3). The extent to which one has ever heard about the term 'bancassurance' also influences the customer's perception as to whether the processing time to purchase an insurance product form a bank is quick and efficient (statement 3.5) and whether is it convenient to purchase insurance products from banks (statement 4.1). Customer perception is also influenced by the idea that by having access to both financial and insurance products from one institution only (one-stop-shop), it will save them time.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
1	The distribution of Statement 2.1 is the same across categories of Have you ever heard about the term 'bancassurance'?	Independent-Samples Kruskal-Wallis Test	.065	Retain the null hypothesis.
2	The distribution of Statement 2.2 is the same across categories of Have you ever heard about the term 'bancassurance'?	Independent-Samples Kruskal-Wallis Test	.299	Retain the null hypothesis.
3	The distribution of Statement 2.3 is the same across categories of Have you ever heard about the term 'bancassurance'?	Independent-Samples Kruskal-Wallis Test	.035	Reject the null hypothesis.
4	The distribution of Statement 2.4 is the same across categories of Have you ever heard about the term 'bancassurance'?	Independent-Samples Kruskal-Wallis Test	.250	Retain the null hypothesis.
5	The distribution of Statement 2.5 is the same across categories of Have you ever heard about the term 'bancassurance'?	Independent-Samples Kruskal-Wallis Test	.234	Retain the null hypothesis.
6	The distribution of Statement 3.1 is the same across categories of Have you ever heard about the term 'bancassurance'?	Independent-Samples Kruskal-Wallis Test	.203	Retain the null hypothesis.
7	The distribution of Statement 3.2 is the same across categories of Have you ever heard about the term 'bancassurance'?	Independent-Samples Kruskal-Wallis Test	.229	Retain the null hypothesis.
8	The distribution of Statement 3.3 is the same across categories of Have you ever heard about the term 'bancassurance'?	Independent-Samples Kruskal-Wallis Test	.419	Retain the null hypothesis.
9	The distribution of Statement 3.4 is the same across categories of Have you ever heard about the term 'bancassurance'?	Independent-Samples Kruskal-Wallis Test	.488	Retain the null hypothesis.
10	The distribution of Statement 3.5 is the same across categories of Have you ever heard about the term 'bancassurance'?	Independent-Samples Kruskal-Wallis Test	.014	Reject the null hypothesis.
11	The distribution of Statement 4.1 is the same across categories of Have you ever heard about the term 'bancassurance'?	Independent-Samples Kruskal-Wallis Test	.044	Reject the null hypothesis.
12	The distribution of Statement 4.2 is the same across categories of Have you ever heard about the term 'bancassurance'?	Independent-Samples Kruskal-Wallis Test	.023	Reject the null hypothesis.
13	The distribution of Statement 4.3 is the same across categories of Have you ever heard about the term 'bancassurance'?	Independent-Samples Kruskal-Wallis Test	.501	Retain the null hypothesis.
14	The distribution of Statement 4.4 is the same across categories of Have you ever heard about the term 'bancassurance'?	Independent-Samples Kruskal-Wallis Test	.324	Retain the null hypothesis.
15	The distribution of Statement 4.5 is the same across categories of Have you ever heard about the term 'bancassurance'?	Independent-Samples Kruskal-Wallis Test	.949	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Table 4.3: Kruskal-Wallis test. Results (Authors' compilation)

(d) Bancassurance Clients

The authors also used Kruskal-Wallis test to compare the participants who are bancassurance clients and those who are not (Q1.5) for each statement. As can be seen in Table 4.4 only the null hypothesis for statements 2.1, 2.4, 3.2, 3.3, 4.3, and 4.4 was not rejected. This is because p-values were greater than the significance level ($\alpha=0.05$). Hence, there is no statistically significant difference in the groups representing whether the participant is a bancassurance client or not. Therefore, it can be concluded that

whether one is a bancassurance client or not does not influence the customer's perception of bancassurance.

On the other hand, statements 2.2, 2.3, 2.5, 3.1, 3.4, 3.5, 4.1, 4.2, and 4.5, were all rejected. This is because their p-values (0.001, 0.001, 0.046, 0.048, 0.007, 0.002, 0.000, 0.000 and 0.042 respectively) were less than the significance level ($\alpha=0.05$). Thus, there is a statistically significant difference in the groups representing whether one is a bancassurance client or not. This means that it can be concluded that whether one is a bancassurance client or not does influence the customer's perception as to whether they would purchase insurance products from banks based on the trust they have in their bank (statement 2.2) and the fact that the bank better understands one's own needs and financial position (statement 2.3). These results also show that it also influenced whether they would purchase insurance products based on the bank's brand image and the fact that the bank is well known (statement 2.5).

Customer perception is also influenced by whether the premium to purchase an insurance product is fair and reasonable (statement 3.1), whether clients would purchase insurance products from a bank based on their satisfaction with the bank's services (statement 3.4) and whether the processing time to purchase an insurance product from a bank is quick and efficient (statement 3.5). It is also influenced by whether the purchasing of an insurance product from a bank is convenient (statement 4.1) and as to whether they would purchase insurance products from a bank based on the idea that by having access to both financial and insurance products from one institution only (one-stop-shop) saves them time (statement 4.2). Finally, whether one is a bancassurance client or not influences customer perception as to whether they would purchase life insurance to have peace of mind that their dependents will be financially protected should they die (statement 4.5).

4.5 Thematic Analysis

As discussed in Chapter 3, at the end of the questionnaire the authors included a comment box where the participants had the opportunity to add any additional comments that they felt were relevant to the subject. To analyse these comments, thematic analysis was used. Out of the 384 participants, only 19 left a comment.

A theme which emerged from the comment boxes was the lack of information on bancassurance. A participant claimed that banks do not promote such services, such that people are unaware of bancassurance. This participant also added that the majority of the public prefer to purchase insurance products directly from an insurer rather than from a bank. Another participant emphasised that bancassurance is unpopular due to lack of information and the fact that only life insurance and/or private pension plan can be purchased. In his/her opinion, bancassurance can become popular if the bank starts selling non-life insurance products.

Another theme which emerged was that the processing time for purchasing an insurance product from a bank is long. A participant stated that although there is the concept of a one-stop-shop when purchasing insurance products from a bank, the processing time is long. Hence, he/she stated that it is inconvenient. Two participants claimed that they had lost trust in banks. One of these participants emphasised that he/she lost trust in local banks and hence it is better to purchase insurance products from an insurer. The other participant stated that he/she lost trust in banks due to mishandling of his/her assets where he/she lost money. Adding to this, a participant claimed that banks must be more cautious in their work.

Another theme which emerged from the comment boxes was personal preference. Specifically, one participant stated that he/she prefers to invest his/her money in bonds or equities rather than purchasing insurance products. A participant claimed that he/she is concerned about whether the bank employs personnel that really know about insurance. This is because in his/her opinion if a person goes to purchase an insurance product from a bank, the personnel does not really explain all the options available. It was also stated that if a claim arises when the insurance product is purchased from a bank, the process to settle such a claim takes longer than if a claim arises when the insurance product is purchased from an insurer.

A participant stated that although he/she believes in banks and likes the fact of having life insurance and/or private pension plans available there, he/she cannot afford any additional monthly payments.

Another participant stated saving for the future is a must and that further awareness of the benefits of starting save at a young age is needed.

A participant claimed that he/she needed a home loan urgently. Hence, he/she was obliged to take out life insurance for the term of the loan from a local bank. However, he/she stated that it was badly managed and if he/she had more time, he/she wouldn't have purchased this insurance product from the bank.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
1	The distribution of Statement 2.1 is the same across categories of Are you a bancassurance client?.	Independent-Samples Kruskal-Wallis Test	.110	Retain the null hypothesis.
2	The distribution of Statement 2.2 is the same across categories of Are you a bancassurance client?.	Independent-Samples Kruskal-Wallis Test	.001	Reject the null hypothesis.
3	The distribution of Statement 2.3 is the same across categories of Are you a bancassurance client?.	Independent-Samples Kruskal-Wallis Test	.001	Reject the null hypothesis.
4	The distribution of Statement 2.4 is the same across categories of Are you a bancassurance client?.	Independent-Samples Kruskal-Wallis Test	.227	Retain the null hypothesis.
5	The distribution of Statement 2.5 is the same across categories of Are you a bancassurance client?.	Independent-Samples Kruskal-Wallis Test	.046	Reject the null hypothesis.
6	The distribution of Statement 3.1 is the same across categories of Are you a bancassurance client?.	Independent-Samples Kruskal-Wallis Test	.048	Reject the null hypothesis.
7	The distribution of Statement 3.2 is the same across categories of Are you a bancassurance client?.	Independent-Samples Kruskal-Wallis Test	.057	Retain the null hypothesis.
8	The distribution of Statement 3.3 is the same across categories of Are you a bancassurance client?.	Independent-Samples Kruskal-Wallis Test	.847	Retain the null hypothesis.
9	The distribution of Statement 3.4 is the same across categories of Are you a bancassurance client?.	Independent-Samples Kruskal-Wallis Test	.007	Reject the null hypothesis.
10	The distribution of Statement 3.5 is the same across categories of Are you a bancassurance client?.	Independent-Samples Kruskal-Wallis Test	.002	Reject the null hypothesis.
11	The distribution of Statement 4.1 is the same across categories of Are you a bancassurance client?.	Independent-Samples Kruskal-Wallis Test	.000	Reject the null hypothesis.

12	The distribution of Statement 4.2 is the same across categories of Are you a bancassurance client?.	Independent-Samples Kruskal-Wallis Test	.000	Reject the null hypothesis.
13	The distribution of Statement 4.3 is the same across categories of Are you a bancassurance client?.	Independent-Samples Kruskal-Wallis Test	.967	Retain the null hypothesis.
14	The distribution of Statement 4.4 is the same across categories of Are you a bancassurance client?.	Independent-Samples Kruskal-Wallis Test	.064	Retain the null hypothesis.
15	The distribution of Statement 4.5 is the same across categories of Are you a bancassurance client?.	Independent-Samples Kruskal-Wallis Test	.042	Reject the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Table 4.4: Kruskal-Wallis test. Results (authors' compilation)_

Theme	Description
Lack of information	6 out of 19 participants claimed that there is a lack of information on bancassurance, leading it to its unpopularity.
Long processing time	2 out of 19 participants claimed that the processing time to purchase an insurance product from a bank is long.
Lack of trust	2 out of 19 participants stated that they had lost trust in banks.
Prefer to purchase insurance products from an insurer	1 out of 19 participants stated that they prefer to purchase an insurance product from an insurer.
Be more cautious	1 out of 19 participants stated that banks must be more cautious.
Invest in something else	1 out of 19 participants stated that he/she would prefer to invest in something else rather than purchasing insurance products.
Inconvenient	1 out of 19 participants claimed that bancassurance is inconvenient.
Lengthy claim settlement	1 out of 19 participants stated that a claim settlement takes long to be settled by a bank.
Bank personnel have a lack of knowledge	1 out of 19 participants declared that bank personnel have a lack of knowledge when selling insurance products.
Cannot afford to purchase a life insurance product or a private pension plan	1 out of 19 participants claimed he/she could not afford to purchase a life insurance product or a private pension plan due to other monthly payments.
Awareness to save for the future	1 out of 19 participants emphasised the need to raise awareness to start saving at a young age.
Badly managed	1 out of 19 participants claimed that purchasing insurance products from banks is badly managed.

Table 4.5: Thematic analysis of themes emerging from the comment box

5: Conclusions

All of the participants declared that they are uncertain about most of the statements provided in the questionnaire. This shows the lack of knowledge on bancassurance amongst Maltese nationals.

Advertisements are not motivating Maltese nationals to purchase insurance products from banks. In fact, most of the participants claimed that there is a lack of information on bancassurance. Hence, this means that either banks are not using the appropriate marketing tools to advertise their insurance products or else customers are not paying attention to these advertisements due to their lack of knowledge on bancassurance. Therefore, the message that banks are trying to portray is pointless (Mostert, 1996). Maltese nationals do trust their banks and hence they might purchase insurance products from them. However, there are a number of people who have lost their trust in local banks. This lack of trust is ultimately leading Maltese nationals to lose confidence in banks which is leading them not to purchase any products that the bank is offering. Some claimed that banks must pay more attention in carrying out their work. Hence, banks must pay attention to the reasons why these customers have lost their trust because trust builds the experience and confidence in the qualities of services (Zeithaml, 1981) as well as customer satisfaction (Lewis & Craven, 1995; Tikkanen et al., 2000).

Banks provide services to their customers directly which makes them better understand their customer's needs and financial position (Fields et al., 2007 b). However, the survey showed that Maltese nationals are uncertain about whether banks do better understand their customer's needs and financial position. Hence, this might be stopping Maltese nationals from buying insurance products from banks.

Although a bank might have a good brand image and is well known, Maltese nationals remain uncertain about whether they would purchase insurance products from banks. Hence, banks might enhance their brand image and take the fact that it is well known as an advantage to promote better insurance products so that Maltese nationals will purchase insurance products from the bank and hence, generate more sales. The uncertainty of Maltese nationals on the premium charged and whether the costs are reduced when purchasing insurance products from banks shows the lack of knowledge amongst Maltese nationals on bancassurance. Banks must promote bancassurance by showing their customer that the purchasing of insurance products from banks is economical and convenient. This will give the customer the ability to better access the premiums so that they will be able to compare the prices and hence, the bank can show their customers that the costs are reduced.

Participants claimed that they are uncertain about whether the processing time to purchase an insurance product from a bank is quick and efficient. However, some participants claimed that the processing time to purchase an insurance product from a bank is too long. This might be an issue which is discouraging Maltese nationals' from purchasing insurance products from banks. Therefore, if banks try to shorten the processing time, the customer's satisfaction will increase and hence, more Maltese nationals might purchase insurance products from banks. In addition, some participants claimed that they would prefer to purchase an insurance product from an insurer rather than from a bank. This can be interpreted as many Maltese nationals still classifying banks as an institution which only accepts deposits and gives out loans rather than an institution which also offers other products and services, such as insurance products and investment services.

The idea of a 'one-stop-shop' motivates Maltese nationals to purchase insurance products from banks. However, participants claimed that bancassurance is unpopular due to the fact that only life insurance products and private pension plans can be purchased from banks. However, in 2006, the MFSA issued a publication entitled 'Credit and Financial Institutions – General Business Insurance' stating that certain banks can also sell accident, sickness and miscellaneous financial loss insurance when granting a loan to someone (Buttigieg, 2014). This shows that Maltese nationals are not aware of the selling of these products and hence, banks must promote these products better.

The uncertainty of whether a claim process is long or not shows the lack of knowledge on bancassurance amongst Maltese nationals. However, a participant argued that a claim from a bank takes too long to be settled.

Almost all participants agreed that the purchasing of life insurance products and the setting up of private pension plans gives them peace of mind. An important factor which emerged from the comment box is to raise more awareness of the importance of saving at a young age.

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