

# GLOBAL JOURNAL

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Veterans of World Warborn

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Highlights

Human Resource Disclosure

Tourist's Participate Motivation

Discovering Thoughts, Inventing Future

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# A Study of Sport Tourist's Participate Motivation, Travel Experience, Perceived Value and Behavioral Intention in Marine Sport Tourism

By Hsiao-Ching, Huang

**Abstract-** The purpose of this study was to analyzed marine sport tourism participate motivation, travel experience, perceived value, behavioral intention of tourist. A total of 1219 valid questionnaires were conducted in Penghu, Taiwan, and non-randomized survey was conducted for tourists who participated in marine recreational activities. After the descriptive statistic and analysis of PLS, the results show that marine sport tourism attractions will directly affect the travel experience and perceived value of tourist, and the above two variables will also affect the behavioral intention of the tourist for the destination. Based on the above findings, this study not only advises on marine recreational operations and managers, but also provides research for future researchers.

**Keywords:** *participate motivation, travel experience, perceived value, behavioral intention.*

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Hsiao-Ching, Huang

**Abstract-** The purpose of this study was to analyzed marine sport tourism participate motivation, travel experience, perceived value, behavioral intention of tourist. A total of 1219 valid questionnaires were conducted in Penghu, Taiwan, and non-randomized survey was conducted for tourists who participated in marine recreational activities. After the descriptive statistic and analysis of PLS, the results show that marine sport tourism attractions will directly affect the travel experience and perceived value of tourist, and the above two variables will also affect the behavioral intention of the tourist for the destination. Based on the above findings, this study not only advises on marine recreational operations and managers, but also provides research for future researchers.

**Keywords:** *participate motivation, travel experience, perceived value, behavioral intention.*

## I. INTRODUCTION

The Taiwan area is surrounded by the sea, with abundant marine resources, very suitable for the development of marine leisure oriented sports. Penghu is the largest Islands in Taiwan, has abundant natural resources, including natural tourism resources (marine ecology and wildlife, beaches, intertidal zone, islets, unique basalt geological), cultural tourism resources (rural area, fishing village, temples, historical and cultural monuments), provide an important foundation for tourism development (Wu & Chang, 2013, 2014). Due to the strong northeast monsoon in winter, there is a distinct difference between the tourist season and the busy season in Penghu area. At present, the tourism industry in the Penghu, in the season of tourism, most with water based activities, and these activities are related to sports, such as diving, snorkeling, banana, water motorcycles, air extraction parachute et al (Chang Liao, Yang, & Chang, 2015). Gibson, Attle, and Yiannakis (1998) pointed out that the sport tourism is definition individual for participate sport activities, spectate sports event, or visit tourist attractions, leave resident or work place to travel, its purpose is to participate in the competition or leisure. The tourism product is different from the essence of the product, with no entity, the main product is "experience", so consumers in the experience of the process, whether it is worth the heart feeling, and whether to buy(revisit), is a part of tourism industry's most wanted to know. Based

on the above description, this study reviews the relevant literature found that tourism participation motivation, travel experience and perceived value have influence on behavioral intentions (Zeithaml, Berry, & Parasuraman, 1996) for tourists, therefore use empirical analysis to verify, hoped that the findings of this study can be the theoretical basis and practice of marketing for people participate in marine sports tourism activities to provide reference.

## II. LITERATURE REVIEW

Tourism motivation is the main reason for people to engage in tourism activities, Crandall (1980) defines tourism motivations based on the individual's need for recreational recreation, which leads to the individual's engaged in recreational activities and directs the activity towards a particular goal to meet the needs through recreational behavior. According to Crompton and McKay (1997), "tourism motivation is conceptualized as a dynamic process of internal psychological factors (needs and wants) that generate a state of tension or disequilibrium within individuals" (p.427). Baloglu and McCleary (1999) divide tourism motivation into such factors as relaxation and avoidance, stimulation and adventure, knowledge motivation, social motivation and prestige motivation. Yoon and Uysal (2005) put forward the thrust factors such as excitement, intellectual education, relaxation, family reunion, escape, safe and fun, leaving home and enjoying the scenery. In term of the sport tourism participation motivation, Saayman, Slabbert, and Merwe (2009) study tourists travel motivation of two marine destinations in South Africa. The results revealed both common and different motivational factors when comparing the two marine destinations with one another as well as with other studies conducted. The following motivational factors overlap for the two destinations: escape and relaxation, destination attractiveness, and site attractiveness as well as personal attachment. Merwe, Slabbert, and Saayman (2011) study travel motivations of tourists to selected marine destinations, the result found that motivation includes: destination attractiveness, escape and relaxation, time utilization, and personal attachment.

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Tourists are motivated to understand the reasons for their participation in tourism, and then the most important is their experience at the destination. Travel experience for the individual through the tourism process of participation and experience, and travel process in a variety of humanities, natural environment and other information generated after the interaction of feelings and feelings, and this feeling by the passengers themselves by the social conditions, cultural background (Ryan, 1995; Wearing & Wearing, 1996; Larsen, 2007; Walls et al., 2011). Morgan (2007) study points out that the sport tourists experience at the destination, which includes: social interaction, cultural interactive, social identities, personal meaning, achievement and hedonic pleasures. In some tourism studies, it is found that the motivations of tourists' participation will affect their experience at the destination. The main reason is that their experience is consistent with the motivation, even higher than expected, and the value of their feelings will be higher and more positive (Lo & Lee, 2011; Prebensena, Woo, & Uysal, 2012; Prebensena, Woo, & Uysal, 2014).

*H1.* The participate motivation of tourists has an influence on their travel experience.

*H2.* The participate motivation of tourists has an influence on their perceived value.

Dodds, Monroe, and Grewal (1991) argue that perceived value is an exchange of product or service quality and money costs, and consumers' perceived value will further generate the purchase intention, so the purchase intention depends on perceived benefits and values. Perceived value is regarded as an indicator of willingness to participate again and is the basis for the decision-making of the consumer's consumption process (Parasuraman & Grewal, 2000). Schmitt (1999) points out that when the product or service can satisfy the more customer value, it will bring higher customer satisfaction, and customer satisfaction is positively related to the behavior of the repurchase. From this perspective, the value of tourism can be said to tourists for tourism destination products and services, in the

actual experience of tourists after the products and services for the benefit of the value. The study indicates that customer perceived value will positively affect loyalty, and when the customer perceives positive quality of service, it will make a positive performance (Zeithaml, 1988; Fredericks & Salter, 1995). In some studies of the tourist experience, also found that tourists in the destination experience will affect their future visits and recommended to other people's behavioral intentions (Altunel & Erkut, 2015; Prayag, Hosany, & Odeh, 2013).

Behavior intention is often used to measure the future behavior of the index, Oliver (1980) put forward the model of causal cognitive decision satisfaction, satisfaction evaluation and judgment for the purchase behavior generated will affect the behavior intention. Zeithaml, Berry, and Parasuraman (1996) point out that the behavior intention of customer retention index is whether the company can succeed, when customer perceived service quality is high, the store's intention is positive, including the others or appreciation of this store, increase customer loyalty and increase consumer is willing to pay a higher price; on the contrary, when the customer perceived the service quality is low, the store's intention is negative, including criticism or complain about this store, into another store consumption, so to predict a person's behavior, behavior intention is often accurate measure. The tourist destination choice behavior, include visit and with the evaluation of tourism product and the future behavioral intention (Chen & Tsai, 2007), in related research, also the empirical "perceived value" is to predict the future behavior intention (Chen, 2008; Chen & Chen, 2010; Cronin, Brady, & Hult, 2000; Petrick, 2004).

*H3.* The more positive the travel experience of tourists at destination, the higher their perceived value.

*H4.* The more positive the travel experiences of tourists at destination, the higher their behavior intention.

*H5.* The higher the perceived value of tourists at destination, the higher their behavior intention.

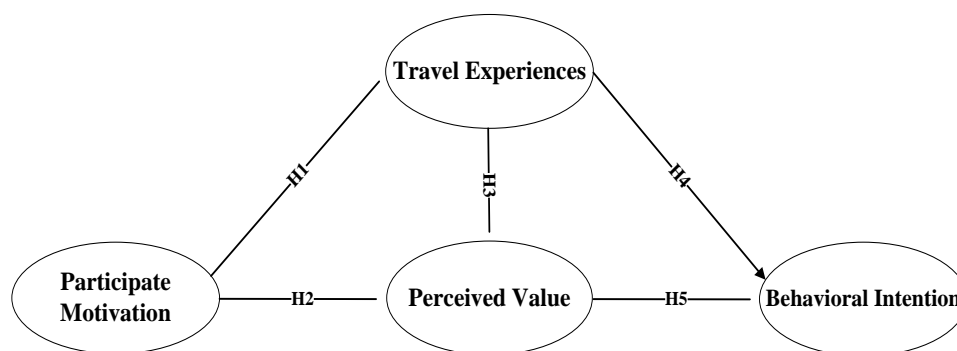


Figure 1: Hypotheses Model

### III. METHOD

#### a) Research Area

Penghu is located in the Taiwan Strait between China and Taiwan, is located in the Taiwan Strait on a group of islands, east of Taiwan Island about 50 km west from the Eurasian continent about 140 km, composed of 90 islands, the total area of about 128 square kilometers. Marine recreational activities in Penghu include water motorcycles, high-altitude tractors, mandarin ducks, snorkeling, diving, banana boats, donuts, yachts, canoeing, sailing and wind and waves.

#### b) Subject and Sampling

In this study, residents of the island of Taiwan province to Penghu national scenic area participate in marine recreational activities and more than 20 years of age of tourists as the research object, using convenience sampling method, questionnaire survey was conducted on I-Man beach in Magong city. Before survey, researcher and assist students, will ask the tourists they whether engaged in marine recreational activities, and can cooperate fill in questionnaire, if answer "yes", after to implementation. In this study, a total of 1400 questionnaires were survey, 1237 questionnaires were collected, 18 incomplete questionnaires were filled out, and 1219 valid questionnaires were received. The effective questionnaire rate was 87.07%.

#### c) Questionnaire

This study is divided into four parts, the first part is the "marine sports tourism participate motivation scale", the main purpose is to understand the reason of tourists participate in marine sports tourism, this part of the scale consisted of 12 items, and 2 factors, respectively "ocean climate comfort" and "active challenge and stimulation". This part of the scale is referred relate tourist participate motivation study to the of the reference preparation. The compilation of this part of the questionnaire is mainly based on the relevant research on the motivation of tourism participation (Chang Liao, Yang, & Chang, 2015). The second part is the "travel experience scale". The main task is to understand the tourists they travel in Penghu, in the process, for attractions, environment, activities, personnel service experience, this part of the scale consisted of 18 items, and 4 factors, respectively "activity experience" and " cultural experience" and " attractions service" and "goods and services", and compiled the scale mainly refer to the relevant study of tourism experience and service (Ryan, 1995; Wearing & Wearing, 1996; Larsen, 2007; Walls et al., 2011; Wu & Chang, 2013, 2014). The third part is the "perceived value scale". The main purpose is to understand the tourists they think paid money, time, and efforts whether it is worth the travel in Penghu, this part of the scale

consists of 3 questions, and compiled the scale mainly refer to the relevant study of perceived value (Dodds, Monroe, & Grewal, 1991; Zeithaml, 1988). The fourth part is the "behavioral intention scale". The main purpose is to understand the revisiting willingness of Penghu, or the future will recommend to other local marine recreational activities of the wishes of the people, this part of the scale consisted of 3 items, the and compiled the scale mainly refer to the relevant study of behavioral intention (Zeithaml, Berry, & Parasuraman, 1996). The above four questionnaires were measured by Likert five-point scale, from "very agree" (5 points), "agree" (4 points), "ordinary" (3 points), "not agree" (2 points), to "very not disagree" (1 points). The fifth part is participants their basic personal information, includes: gender, age, education level, marital status, monthly income, occupation, and average number of runs per week.

#### d) Data Analysis

In this study, collected effective questionnaires, use statistical analysis steps are as follows: 1. use SPSS For Windows 22 software, the frequency distribution and percentage of descriptive statistics, to analyzed the population distribution of background variables of tourists. 2. use Warp PLS 5 statistical software with partial least squares (PLS) to analyzed the marine sport tourism participate motivation, travel experience, perceived value and behavioral intention scale reliability and validity, as well as analyzed the four variables between causal relationship.

### IV. RESULT

#### a) Respondent characteristics analysis

Among the 1426 respondents, there were 518 males (42.5%) and 687 females (56.4%). In the marital status, 349 are married (28.6%) and 697 unmarried (57.2%). In the age, 21-30 are 746 (61.2%), 31-40 years old are 279 (22.9%), 41-50 years old are 151 (12.4%), 51-60 years old are 40 (3.3%), 60 years old and above are 2 (.2%). In the monthly income per person (US\$ 1=30 NT\$), there are 302 people (24.8%) per month below NT.20000, NT. 20001-40000 are 395 people (32.4%), NT. 40001-60000 are 209 people (17.1%), NT. 60001-80000 are 64 people (5.3%), NT. 80001-100000 are 25 people (2.1%), NT. 100001(and more than) are 18 people (1.5%), and 201 (16.5%) non-income. In the occupation, there are 440 students (36.1%), soldiers, police, civil servants and teachers have 127 (10.4%), financial services industry are 82 (6.7%), industry and commerce services are 137 (11.2%), manufacturing industry are 67 (5.5%), business are 80 (6.6%), free occupation are 73 (6%), retired and materfamilias are 53 (4.3%), doctors and nursing staff are 33 (2.7%), information and electronics industry are 58 (4.8%), transportation industry are 16 (1.3%), agriculture and

fisheries are 8 people (.7%), and in other industries but not demonstrated 41 (3.4%).

*b) Analysis of reliability and validity of participation motivation*

*Table 1:* Summary of Confirmatory Factor Analysis of Participate Motivation

Latent variables	Observe variables	Mean	SD	Factor loading	CR	Cronbach's $\alpha$	AVE
Water activities safety and excitement	11. Water activities are safety	4.01	.76	.66	.82	.74	.53
	10. The seabed is not polluted	4.14	.74	.59			
	4. have professional coaches and service staff	4.01	.78	.67			
	7. Provision of marine sports facilities and equipment	4.13	.71	.68			
	12. A variety of aquatic activities	4.09	.72	.66			
	13. the activity adventure and excitement	3.93	.71	.69			
Comfortable environment and climate	1. The weather is pleasant in summer	4.04	.74	.69	.84	.78	.57
	2. The seawater is clear	4.03	.75	.70			
	8. The beach space is spacious	4.21	.71	.67			
	9. Air quality is good	4.24	.68	.67			
	5. Can watch the ocean landscape	4.17	.71	.71			
	6. The ecological resources are abundant	4.14	.72	.68			

Table 2 analysis of the results show that the two factors of the composite reliability are more than .80, Cronbach's  $\alpha$  value is also .70 or more, showing a good reliability (Hair et al., 2010). In terms of validity, the

values of observe variable are more than .70, and the average variance extraction (AVE) is above .50, so the validity of this scale is good (Fornell & Larcker, 1981).

*c) Analysis of reliability and validity of Travel Experiences*

*Table 2:* Summary of Confirmatory Factor Analysis of Travel Experiences

Latent variables	Observe variables	Mean	SD	Factor loading	CR	Cronbach's $\alpha$	AVE
Activity experience	8. The equipment is safe and well	4.01	.72	.71	.80	.79	.56
	9. Service personnel instruction skill is good	3.98	.72	.74			
	10. Exciting and challenge	4.03	.73	.79			
	11. Provided me highest funny	4.05	.73	.75			
	1. Let me body and mind relief	4.03	.72	.71			
Cultural experience	4. Let me contact different folk custom and culture.	4.06	.70	.73	.81	.72	.52
	2. Let me feel newly experience	3.95	.67	.76			
	3. Let me have opportunity for interact with others.	3.95	.70	.79			
	5. Let me taste the delicious and famous snacks	4.13	.71	.76			
	7. Accommodation makes me comfortable and satisfied during the trip	4.04	.72	.72			
	6. Traffic makes me comfortable and convenient during the trip	3.96	.75	.72			
Scenic spot service	17. Tourist attractions are provided with travel information	3.93	.73	.77	.78	.73	.58
	13. Tourist attractions, natural environment, beautiful landscape	3.87	.68	.72			
	12. The tourist attractions are well equipped	3.80	.68	.76			
	14. Environmental cleaning of tourist attractions	3.86	.71	.79			
Commodity Services	18. Souvenirs are plentiful and the price is reasonable	3.75	.86	.81	.82	.77	.61
	15. Reasonable price of food and beverage	3.74	.86	.82			
	16. The tourist service personnel in the scenic spot have a good attitude	3.97	.74	.71			

Table 3 analysis of the results show that the four factors of the composite reliability are more than .80,

Cronbach's  $\alpha$  value is also .70 or more, showing a good reliability. In terms of validity, the values of observe

variable are more than .70, and the average variance extraction (AVE) is above .50, so the validity of this scale is good.

#### d) Analysis of reliability and validity of Perceived Value and Behavioral Intention

**Table 3:** Summary of Confirmatory Factor Analysis of Perceived Value and Behavioral Intention

Latent variables	Observe variables	Mean	SD	Factor loading	CR	Cronbach's $\alpha$	AVE
PV	1. Money	3.89	.69	.82	.84	.72	.64
	2. Time	3.94	.68	.82			
	3. Effort	4.03	.66	.77			
BH	1. In the future, I want to visit Penghu again	4.14	.72	.80	.79	.71	.56
	2. Will recommend friends and family to Penghu Tourism	4.16	.69	.78			
	3. Compared to other islands, Penghu is still a priority	3.88	.76	.76			

Table 4 analysis of the results show that the perceived value and behavioral intention factors of the composite reliability are more than .70, Cronbach's  $\alpha$  value is also .70 or more, showing a good reliability. In terms of validity, the values of observe variable are more than .70, and the AVE is above .50, so the validity of this scale is good.

#### e) Sstructural equation model analysis

This study uses PLS to analyze the relationship between the three factors of "participate motivation", "service satisfaction" and "leisure benefit". The structural equation model and the result are shown in Fig.2. In Figure 2, the value on the line indicates that the path coefficient is a normalized regression coefficient ( $\beta$  value), where the "participate motivation" have a positive effect on "travel experience" ( $\beta = .61$ ,  $p < .01$ ) and "perceived value" ( $\beta = .26$ ,  $p < .01$ ); then "travel experience" have a positive effect on "behavioral intention" ( $\beta = .42$ ,  $p < .01$ ), finally "perceived value" have a positive effect on "behavioral intention" ( $\beta = .32$ ,  $p < .01$ ).

## V. CONCLUSION AND SUGGESTION

#### a) Conclusion

The results of the analysis show the relationship between the latent variables in the model, first, the "participate motivation" has a positive impact on the "travel experience", so that the hypothesis 1 is supported. Because tourists come to the island of Penghu for vacation, they are engaged in marine recreation activities because of the influence of local "water activities safety and excitement" and "comfortable environment and climate". Tourists in the above two motives, have met, so they in the local activity experience, cultural experience, scenic spot service, and commodity services, are a positive effect (Lo & Lee, 2011; Prebensena, Woo, & Uysal, 2012; Prebensena, Woo, & Uysal, 2014). Not only that, they think it is worthwhile to travel to Penghu, so hypothesis 2 is also set up and supports the relevant tourism studies that the higher the motivations of tourists and can be met, they

think the time, money, and physical strength is worth in the destination (Kim, Borges, & Chon, 2006; Lo & Lee, 2011).

Then the travel experience of the tourist has a positive impact on the perceived value, so hypothesis that the establishment of 3, also supports the relevant tourism research that the tourists in the destination experience is positive, and the experience is good, they perceive the value are higher. From the above results, visitors can be found in the marine recreational activities experience, is to feel the safety and excitement. On the island they also feel the fishing experience of the fishing village, as well as good tourist service, so they think it is worthwhile to spend time, money and physical strength at the destination. And this good and positive experience, so that their future to revisit and recommend to others or friends and family will be very high, so this study according to the relevant literature proposed hypothesis 4 also supported (Altunel & Erkut, 2015; Prayag, Hosany, & Odeh, 2013), and also shows the tourists in the destination the experience is very important for tourism services.

Finally, the results also find that the "perceived value" has a positive effect on the "behavioral intention". Therefore, this study is supported by hypothesis 5 proposed in the relevant literature (Chen, 2008; Chen & Chen, 2010; Chen & Tsai, 2007; Cronin, Brady, & Hult, 2000; Petrick, 2004). From the above results, tourists can be found to engage in marine recreational activities in Penghu, they think that the money, time, and physical strength spent on tourism is worth will affect their willingness to come back later and recommend to others or friends and family.

So according to the above discussion, the following conclusions can be obtained, is the tourists of participate motivation will affect them of travel experience in the destination, and their travel experience more positive, they will think this trip is worth in the destination, on the future, behavioral intention will be higher.



## b) Suggestion

### i. Suggestions for Government

As a result of the development of tourism mainly requires government assistance, from the results of this study, the researchers suggested that government departments should first strengthen the local marine environmental protection, urge the operators of marine recreational activities, activities do not cause pollution of the marine environment, and to ensure that tourists are engaged in the safety of activities. For the tourism industry, reasonable to regulate the price of food and souvenirs, as well as good staff services. In addition, the government should strengthen the maintenance of the destination landscape, as well as the shape of the fishing village image, and provide the necessary tourist information and personnel services.

### ii. Suggestions for tourism industry

For the results of this study, marine tourism and leisure operators, the following points must comply with the implementation of the industry: (1) the implementation of marine recreational activities, safety management, to protect the safety of tourists; (2) activities continue to innovate and diverse, (3) to maintain the cleanliness of the beach, do not cause pollution; (4) the price of goods sold clearly marked, and the staff attitude is good. (5) to enhance the quality of marine recreational service staff; To enhance the tourists on the island to provide meals, public facilities, attractions, service satisfaction, to maintain the future tourists will want to revisit the island, and let them willing to recommend friends and family to the island engaged in marine recreational activities.

### iii. Suggestions for future researchers

First of all, in the study of variables, due to the construction model in this study, according to the relevant literature to construct the four variables, but after the empirical, there are still insufficient places. First of all, in the participate motivation, the reaction of the respondents, the lack of interpersonal motivation to participate in the study, as well as the influence of tourism advertising, suggesting that future researchers in the motivation should further strengthen the questionnaire. In addition, in terms of experience, because some of the items referred to things, the subjects did not experience very profound, so the experience cannot fill the actual experience, it is recommended that future researchers, in the experience of the questionnaire to pay attention on tourists range of activities. In addition, the respondents also suggested that the service items may consider increase the quality of service and satisfaction factors.

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# Human Resource Disclosure and its Association with Corporate Attributes

By Dr. Lokanath Mishra & Dr. Richa Mishra

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**Abstract-** Corporate disclosures in annual reports has increased manifold particularly in last decade providing a plethora of information about accounting and corporate reporting practices. Corporate annual reports are becoming an outlet for disclosures various information of both voluntary and mandatory, financial and non-financial and other aspects of company performance. Human Resource is one of the important aspects of effective and efficient company management and information about the same are useful for various stakeholders. The present study investigated the extent of human resources disclosures in annual reports by both the manufacturing and service industries in India, the study used multiple regression models to examine the impact of selected corporate attribute like age, turnover, total asset, profitability, market capitalization and promoter's shareholding on the extent of HR disclosures in corporate annual report. The result of the study shows that manufacturing companies have better HR disclosures as compared to IT companies. The result also shows statistically significant relationship between market capitalization and promoter's shareholding with the extent of HR disclosures. However, age, turnover, profitability and total asset don't have any influence over the level of HR disclosures.

**Keywords:** *human resource, corporate disclosure, annual report.*

**GJMBR-G Classification:** *JEL Code: O15*



*Strictly as per the compliance and regulations of:*



# Human Resource Disclosure and its Association with Corporate Attributes

Dr. Lokanath Mishra<sup>α</sup> & Dr. Richa Mishra<sup>σ</sup>

**Abstract-** Corporate disclosures in annual reports has increased manifold particularly in last decade providing a plethora of information about accounting and corporate reporting practices. Corporate annual reports are becoming an outlet for disclosures various information of both voluntary and mandatory, financial and non-financial and other aspects of company performance. Human Resource is one of the important aspects of effective and efficient company management and information about the same are useful for various stakeholders. The present study investigated the extent of human resources disclosures in annual reports by both the manufacturing and service industries in India, the study used multiple regression models to examine the impact of selected corporate attribute like age, turnover, total asset, profitability, market capitalization and promoter's shareholding on the extent of HR disclosures in corporate annual report. The result of the study shows that manufacturing companies have better HR disclosures as compared to IT companies. The result also shows statistically significant relationship between market capitalization and promoter's shareholding with the extent of HR disclosures. However, age, turnover, profitability and total asset don't have any influence over the level of HR disclosures.

**Keywords:** human resource, corporate disclosure, annual report.

## I. INTRODUCTION

Human resources are the people who make up the workforce of an organization, business sector, or economy. "Human capital" is sometimes used synonymously with "human resources", although human capital typically refers to a more narrow view (i.e., the knowledge the individuals embody and economic growth). Likewise, other terms sometimes used include "manpower", "talent", "labor", "personnel", or simply "people". A human resource is department (HR department) of a company performs human resource management, overseeing various aspects of employment, such as compliance with labor law and employment standards, administration of employee benefits and some aspects of recruitment and dismissal. Human resources is important to organizations in various areas, ranging from strategic planning to company image. HR practitioners in a small business who have well-rounded expertise provide a number of services to employees. The areas in which

HR maintains control can enhance employees' perception of HR throughout the workforce when they believe HR considers employees to be its internal customers and renders services with that in mind. The human resource is important for an organization Human Resources helps managers who are good at the operational aspect of their job but who don't know how to manage their people.

To ensure that companies don't discriminate in how they handle their employees, there are a number of laws and reporting requirements that have pretty stiff monetary consequences. HR keeps up with these to protect the company. In the present era, Human Resource plays a strategic role. The experience, knowledge and skills of the employees of an organization are its real capital, especially when it comes to the knowledge based industry like banking, IT and other service sector. Therefore, HR disclosure plays a significant role in the determination of productivity, profitability and sustainability while, also forming a basis for decision making for the management of a company. Disclosure leads to information asymmetry which is important for an organization. Human Resource Disclosure provides quantitative and qualitative information about the value of human assets and this information has been proved to be useful in making decisions internally and externally. The measuring of human resource is perceived as important, firstly, because the measurement reflects the strategic and competitive importance of human resources, and secondly, because in order to earn credibility of an organization, human resource must be expressed in financial terms.

Disclosure was first developed to help management make decisions. The two most prominent classes of decision makers who are most likely to use the accounting information are the investors in securities (external) and managers who make resource allocation decisions within the firms (internal). The investors can benefit from the human resource data as they reflect on the current state of business organizations and their growth possibilities. On the other hand, this information is vital for the managers in determining the cost of specific personnel behaviors, such as training and turnover, which in turn will encourage better assessment and development of people. Human Resource Disclosure provides quantitative and qualitative

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information about the value of human assets and this data would also enable managers to identify the investments of human resource and the job requirements of employees, to make appropriate decisions and to evaluate the management's utilization of human resources. Human resource disclosure internally helps the top management make decisions regarding the adequacy of human resources; it has an impact on the decisions of the investors, clients and potential staff of the organization. Without proper valuation and accounting of human resources, the management may not be able to recognize the negative effects of certain programmes, aimed at improving profits in the short run. If not recognized on time, this might lead to the fall in productivity levels, high turnover rates and low morale among the existing employees. There is a positive correlation between human resource disclosure practices and business performance, confirming that the manner of alignment between human resource and business strategy has an impact on organizational performance.

## II. HUMAN RESOURCE DISCLOSURE IN INDUSTRY

Human capital reporting has received considerable academic and practitioner attention across the globe during the past decade and a half. The corporations in the developed countries are usually disclose HR information in formal pattern in their annual report but in the developing countries like India, HR disclosure aspect is very new concept and it is still in infant stage. Though it is not compulsory for the companies in India, but they are making some HR disclosure voluntarily. There has been a scarcity of research on HR disclosure in the perspective of emerging economies. As the human resource has been considered as tactical capital, its accounting and disclosure aspects are becoming significant for the organizational success. So far our knowledge concern, no rigorous research work has been done on human resource reporting in annual report of manufacturing and IT industries in India. Hence, this study is an attempt to investigate the HR reporting practices in the manufacturing and IT sector in India and to evaluate the relationship between company attributes and Human Resource Disclosure.

## III. LITERATURE REVIEW

Various works of the previous scholars in the area of human resource disclosure practices in India and Abroad, has been review to get an insight and framing the research objective and methodology. Joshi Mahesh (2009) has examined Intellectual capital disclosures under financial report of the 15 IT companies in India and found that Human Resource of Indian company is very negligible, Similarly, Mahboob,

Rahman & Imran (2004) examined annual reports of 40 companies listed in Dhaka stock exchange, Bangladesh for nature of voluntary disclosure on their human resource and found that the companies were making HR disclosure even though it was not mandatory. Miin & Siddiq (2012) has revealed Human resource disclosure under corporate characteristic in Malaysia by using SPSS and content analysis of word count technique. The results of their study indicated that the overall extent of HR disclosure is higher in labor intensive industries, he has also studied the perception of stakeholders in Malaysia on HR disclosure by using SPSS and Multiple regression model and revealed that the HR disclosure has significant positive relationship with size of the companies, type of industry and listing status of the companies. Mishra Lokanath and Haldar P.K. (2016) studied 50 Indian Pharmaceutical Companies to ascertain the depth of environmental narratives in corporate annual report and concluded that there is a positive relation between PAT, turnover and level of environment disclosure. Micah Leyira Christian, Ofurum Clifford O. & Ihendinihu John U. (2012) studied the relationship between firm's financial performance and human resource accounting disclosure of companies in Nigeria. The sample size consisted of fifty-two (52) listed firms randomly drawn from all sectors in Nigeria. The study revealed a positive correlation between Return on Equity (ROE) and Human Resource Accounting Disclosure (HRAD) and concluded that this will ensure a higher degree of uniformity and utility to stakeholder. The other research in this area done by Chan Juni & Yeung Davey (2013) examined the effect of the levels of public reporting on human assets among six selected Hong Kong listed companies using content analysis and found that Human Resources (HR) reporting in the annual reports was limited with less than one per cent out of the total coverage, similarly, Batista and Beatriz (2012) studied the Factors explaining the level of voluntary human capital disclosure in the Brazilian capital market by examining 145 annual reports representing 29 companies in the period of 2005-2009 and concluded that that factors such as size, debt, growth and time of registration with the Brazilian Securities and Exchange Commission explain the level of voluntary human capital disclosure of the companies studied. Miin Huui Lee (2010) evaluated annual reports on human resource disclosure using content analysis in Malaysia and suggested that there is a positive correlation between Human Resource Disclosure and the size of the organization, types of industries and the listing status of the organizations. While studying the impact of international financial reporting standard on human resources disclosure Akintoye, et, al (2014) examines the effect of adoption of IFRS on Human Resource Accounting Disclosure (HRAD) in the financial statements of banks in Nigeria. Data for HRAD for 11 Nigerian banks were obtained through content analysis



of financial statements for 2009-2013 and recommend that separate standards should be established for HRAD practices since it is a vital aspect of financial reporting and its disclosure should not be overlooked. Enyi and Oladipupo (2014) evaluated annual report on Human Resource Accounting and Decision Making in Post-Industrial Economy and suggested that human asset significantly affects management decisions as supported by various empirical findings and relevant literatures which also considered employees as important asset critical to the survival of organizations within the competitive economic environment, there is need for this assets to be valued and capitalised like other intangible assets, like goodwill that are captured on organisations balance sheets or statement of financial position.

Radhi and Mishiel (2014) studied the Content and Determinants of Intellectual Capital Disclosure: Evidence from Annual Reports of the Jordanian Industrial Public Listed Companies and found that public industrial firms in Jordan do disclose information about their IC and the almost 17% of the variation in the disclosure of IC information among companies can be explained by several hypothesized factors including the firm's size, capital structure, profitability, ownership concentration, institutional ownership, company's age, and the auditor's type. The other researchers like Naghshbandi, Shukuhian&Chouhan (2016) made a Comparative Analysis of Human Resource Accounting Practices in Indian Steel Companies and found that the steel industry in India has ousted the growth pattern of other sectors and witnessing relatively steep growth rate. Moreover, the steel industry is equally growing in size with the incorporation of new company's day after day. Consequently, the companies are caught in pincers due to the burgeoning competition outwardly and lack of skilled human resources restrain within. Muamme, et.al. (2008) studied Intellectual Capital and Innovation Performance: Empirical Evidence in the Turkish Automotive Supplier and found that the growth rate of the industry indeed had an obvious moderation effect on the relationships between three types of intellectual capital and innovation performance. Paramashivaiah & Puttaswamy (2013) studied the intellectual capital disclosure practices: a new paradigm in financial reporting and found that The disclosure on number of employees is an indication of the size of an organization and can be taken as an aid in analyzing the change in its operations. Market and market information is the most frequently reported items. In one of the recent study Sharma Deepa (2016) has examined intellectual capital reporting practices: a study of annual reports of select Indian firms and found that the it can be seen that most of the intellectual capital disclosures items are reported in various segments of the annual report, like Corporate Governance Report, Director's report, Management discussion & analysis report, Auditor's

report and consolidated financial statement section. Mariana et.al (2011) revealed the determinants of intellectual capital disclosure among 150 companies listed in Bursa Malaysia were selected consisting of five industries: Information Technology, Consumer Product, Industrial Product, Trading/Services and Finance and found that the 72.67 percent of companies disclosed IC in their annual reports reflecting a very high disclosure of IC in Malaysia. Malaysian firms engaged in investor, customer and supplier relations. Similarly, Castelo et.al. (2010) has examined an analysis of intellectual capital disclosure by Portuguese companies and found that difference between a frequency analysis and a line count analysis. They studied a sample of companies from Sri Lanka and found that in 1998/1999 the human capital category was the most reported in terms of line count, but only the second most reported category in terms of frequency, the similar results also found by Deepa&Subha (2016) measuring Intellectual Capital – The Key to Innovation and Sustainability. and found that the relationship of employees, customers, technologies and processes, growth and value addition. Intellectual capital statement brings clarity to the strategies, helps in finding powerful interpretations for the growth story and ameliorates sketches and visualizations about an organization. Salleh Abdul Latif and SelamatFauziah (2007) has examined Intellectual Capital Management in Malaysian Public Listed Companies and found that the business firms in Malaysia do practice intellectual capital management. This is particularly encouraging in the light of Malaysian government's effort to build intellectual capital in Malaysia. Indra&James (2003) has revealed Human capital reporting in a developing nation and found that the Featuring employee contribution was the most notable HC attribute found in the annual reports. Such features generally involve recognizing the employee's effort and commitment towards the firm.

The study of above literature it could be summarized most of the research are conducted in context to foreign countries and very less number of studies are conducted in India. The work done in Indian companies are also limited to top most of the countries and none of the previous work concentrates industries specific HR disclosure practices, which triggers this study to see the sector specific HR disclosure practice by IT and Manufacturing companies. Though Human capital reporting in India is not compulsory the study has been taken to see the voluntary HR disclosure practices by the Indian companies and also how selected corporates attributes influenced the HR disclosure level of the sample companies.

#### IV. SIGNIFICANCE OF THE STUDY

Human capital reporting has received considerable academic and practitioner attention across the globe during the past decade and a half. The



corporations in the developed countries are usually disclose HR information in formal pattern in their annual report but in the developing countries like India, HR disclosure aspect is very new concept and it is still in infant stage. Though it is not compulsory for the companies in India, but they are making some HR disclosure voluntarily. There has been a scarcity of research on HR disclosure in the perspective of emerging economies. As the human resource has been considered as tactical capital, its accounting and disclosure aspects are becoming significant for the organizational success. So far our knowledge concern, no rigorous research work has been done on human resource reporting in annual report of manufacturing and IT industries in India. Hence, this study is an attempt to investigate the HR reporting practices in the manufacturing and IT sector in India and to evaluate the relationship between company attributes and Human Resource Disclosure.

## V. OBJECTIVES OF THE STUDY

- The study Human Resource Disclosure in corporate annual report by Indian Companies.
- To examine the association between level of human resource disclosure and corporate attributes.

## VI. RESEARCH METHODOLOGY

The propose study is of exploratory in nature aims to examine human resource disclosure practices by Indian companies by IT and manufacturing sectors. To 15 companies in in term of market capitalization has be chosen from both the sectors for the purpose of the study. The list of BSE listed companies from the IT and manufacturing sector companies has been selected and top companies chosen on the basis of market capitalization as on 31<sup>st</sup> December 2016. In live of the the annual report of sample companies for the financial year 2015-2017 has been downloaded from the company website. In line of research observed to see the level of HR disclosure by the sample companies The construction of HR disclosure Index has considered as below.

### a) Construction of Disclosure Index

The extent of human resource disclosure practices by IT and manufacturing sectors was measured by the construction of disclosure index on 15 items. The disclosure index was constructed by taking various Human Resource Disclosure parameters and these parameters were taken from various reports and sites.

Table 1: HR disclosure index

S. No.	Items of HR disclosure Index
1	Human resource development policy and program
2	Description of training activities undertaken
3	Loan and advance to employee
4	Employee participation in organization decision making
5	General statement on industrial relation
6	Relationship with women' union
7	Number and occupational group of employee
8	Information about safety policy and measures at work place
9	Disclosure of employee stock option scheme
10	Recruitment policy
11	Pay policy and system
12	Awards and rewards given for good performance
13	Employee welfare activities
14	Performance appraisal system
15	Workers grievance redressal mechanism

This paper uses an unweighted approach for disclosure scoring, because each item in the index was equally important. After developing the index, a score sheet was developed to access the extent of human resource disclosure. If a company discloses an item of information includes in the index, it receives a score of 1 & 0 otherwise. For calculating company wise disclosure, a score sheet of all the items for each company was prepared. The total score indicates the extent of

information disclosed in the annual report. For calculating item wise score, scores assigned to different items in the score sheet of all the companies.

The second objective of the study was to see the impact of various corporate attributes as the level of HR disclosure. The selection of corporate attributes has been done on the basis of literature review the following independent variable has been chosen. Present in the task below:

Variables	Rationale	References
Age	The level of human resource disclosure commitments of older and newer firms may be different.	Vazakidis Athanasios, Stavropoulos Antonios, Galain Despina (2013)
Turnover	Turnover represents the percentage of portfolio that is sold in a particular month or year.	Investopedia
PAT	Profitability is one the study variables for the industry's human resource management. The literature provides results. PAT can be fully retained by a company to be used in the business.	Padmalatha Suresh (2008), Justic Paul (2010)
Total asset	The total assets depict the size of the industry and the widely used variables measure the influence of the company.	Pahuja (2009)
Market Capitalization	Market capitalization shows the value of the company's share in the stock market. This reflects whether the shareholder considers the HR disclosure of the companies.	Gupta and Goldar (2005), Singh Gurdeep (2009)
Promoters Shareholder	A <i>shareholder</i> is any person, company or other institution that owns at least one share of a company's stock. Because shareholders are a company's owners, they reap the benefits of the company's successes in the form of increased stock valuation.	Stavropoulos Antonios

The influence of the above five independent variables on dependent variable human resource disclosure score is estimated using correlation and regression analysis.

#### b) Regression Equation

After satisfy the entire basic assumption for all multiple linear regression analysis, the variation in the level of HR disclosure having combined effect of independent variable has been measured through the multiple regression models. The equation that has been applied is given below along with the results obtained by estimating the regression model.

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \varepsilon$$

Where Y	=	HR disclosure level
$\alpha$	=	Constant
$X_1$	=	Age of the company
$X_2$	=	Profit after tax
$X_3$	=	Total asset
$X_4$	=	Turnover
$X_5$	=	Market capitalization
$X_6$	=	Promoters shareholder
$B_1$ to $\beta_6$	=	Coefficient of respective independent variable
$\varepsilon$	=	Regression residuals

The model consists of six explanatory variables for explaining the behavior of dependent variable. The model has been applied to sample data to test for their statistical significance. The overall significance of the model has been tested through R-Square, F statistics and significant levels.

## VII. DATA ANALYSIS AND INTERPRETATION

The analysis of Human resource disclosure in the corporate annual report of sample companies

revealed that almost all companies provide the human resource disclosure related information. But according to the IT companies the manufacturing sector companies provided the more information. The percentage human resource disclosures of sample companies at corporate annual report are given below:

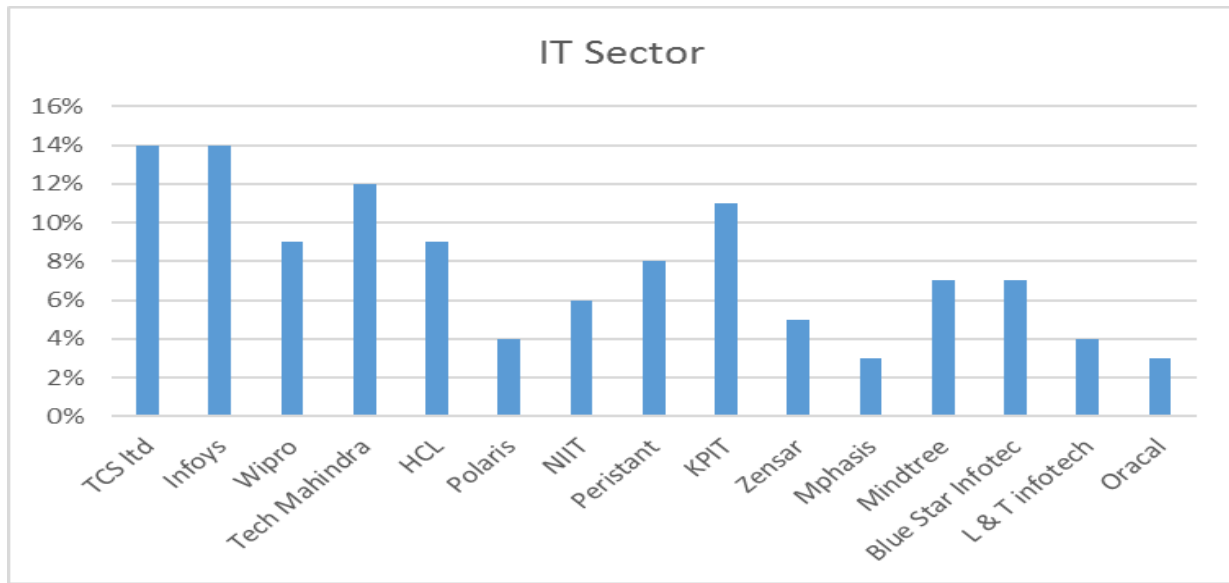


Fig. 1: Items provided according to IT sector companies

TCS Limited and Infosys ranks the highest among the IT Sector with fourteen percent variables falling under TCS and Infosys, followed by Tech Mahindra falling under twelve percent bracket and KPIT under 11.5% bracket. Rest the other companies fall

under 10% bracket which specifies that only few of them make disclosures of their HR facts and Data relevant for the public and out of those who disclose, they disclose only negligible amount of information or vague information.

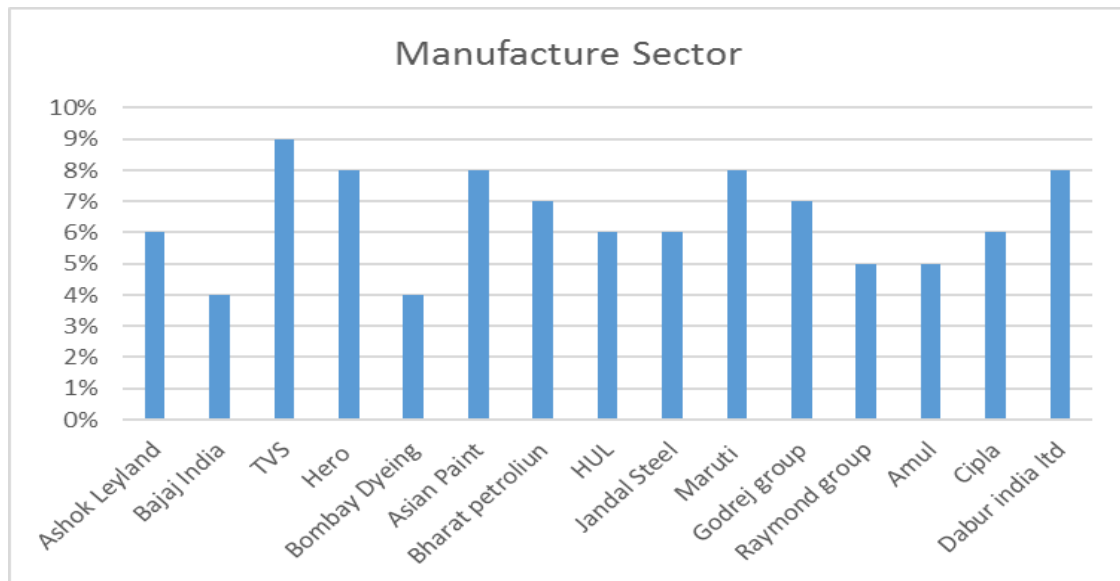


Fig. 2: Items provided according to manufacturing sector companies

TVS, ranks the highest among the Manufacturing Sector with nine variables falling under TVS, Hero, Asian paint, Maruti and Dabur India Ltd followed by Hero, Asian paint, Maruti and Dabur India Ltd falling under eight percent bracket. Rest the other companies fall under 8% bracket which specifies that only few of them make disclosures of their HR facts and Data relevant for the public and out of those who disclose, they disclose only negligible amount of information or vague information.

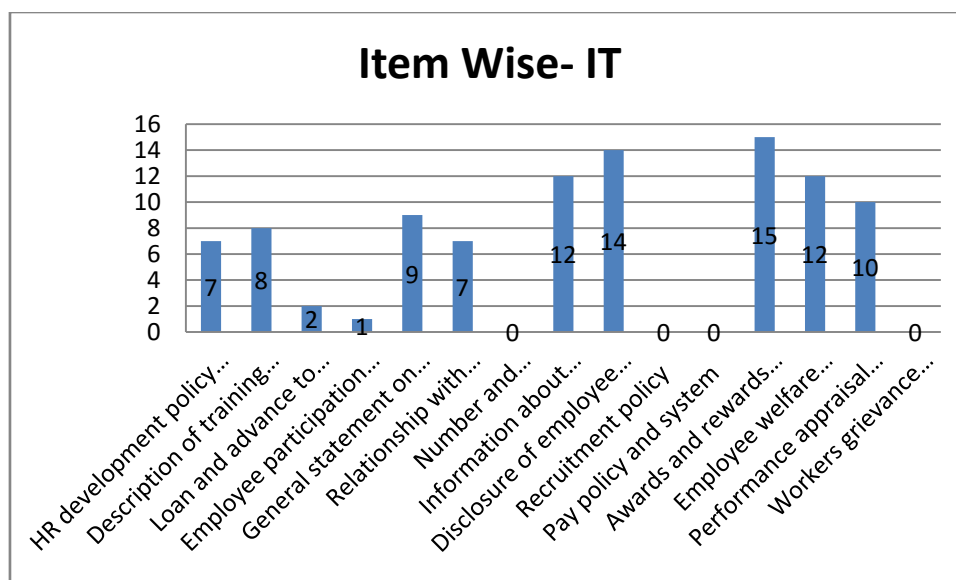


Fig. 3: Item wise human resource disclosure of IT sector

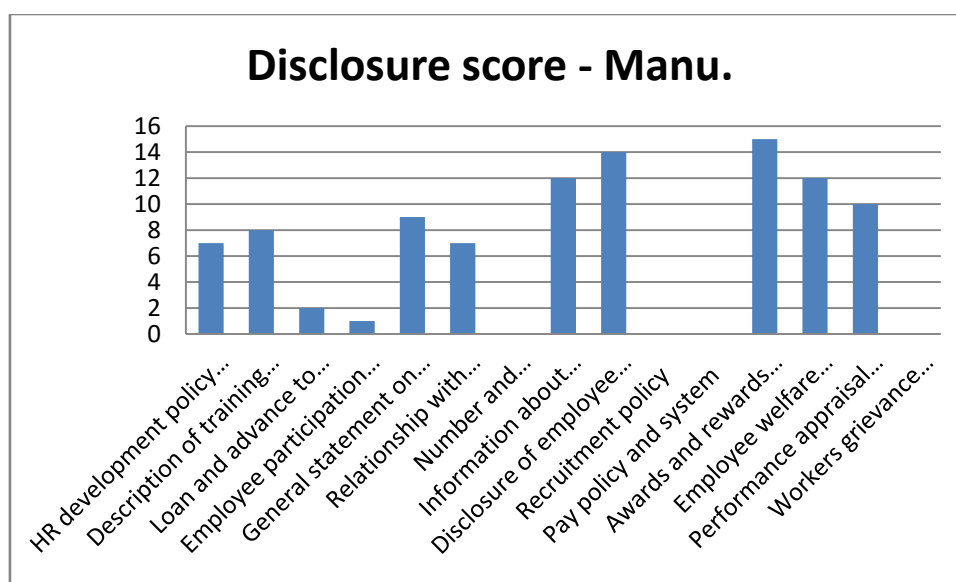


Fig 4: Item wise human resource disclosure of manufacturing sector

HR Department of any company handles the internal customers which attracts the external customers to make a purchase or engage in buying activities. Thus it is found after analyzing the results that Information which is subject matter of employees and rewards systems and policy is not disclosed out in the Annual Reports of the Company. Though such disclosures need

not to be made as it is a matter of ethics but these companies can disclose impact of such policies on the employees of the company to boost the profitability over time. Though some disclosures are made through Annual Reports but majority of that either belongs to statutory requirements or is favoring its marketing initiatives.

Table 2: Analysis of Anova Table

ANOVA<sup>a</sup>

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	95.385	6	15.897	4.158	.007 <sup>b</sup>
Residual	76.467	20	3.823		

F- Value reveals that regression model as a whole has a good fit and has a reasonable explanatory power. The significant F ratio (4.158) shows that all

variables taken together significantly explain the variability observed in human resource disclosure.

Table 3: Model Summary

Mode	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.745 <sup>a</sup>	.555	.422	1.95534

The value of adjusted R square (.422) shows that 42.2% variation in the HR disclosure label is causing by the changes in these independent variable.

Model	t	Sig.
(Constant)	6.863	.000
Age	-.611	.548
Profit After Tax	.267	.792
Total Asset	-.967	.345
Turnover	-.553	.586
Market Capitalization	2.910	.009
Promoters Shareholder	-2.117	.047

The above table presents the relationship of independent variables get dependent variable that is HR disclosure level. We found that two variables that is market capitalization and promotions shareholders has significant relationship with HR disclosure level having two value of 2.910 and -2.117 and significant value of .009 and .047 at 95% of significance level. however other variable has no significant relationship with HR disclosure level. This confirms the null hypothesis name Ho1 and Ho4 is accepted and null hypothesis Ho5 and Ho6 is rejected alternative hypothesis is accepted. The result are in line with studies conducted by Mishra Lokanath, Joshi Mahesh, Chan Juni and Yeung Davey.

## VIII. FINDINGS AND CONCLUSION

It is very interesting to note that the level of human resource disclosure by sample IT and Manufacturing companies in India is more of compliance with the human resource activities. Around 70 percent of the companies provided information about various human resource issues applicable to their companies and to which they are complying with, but none of the companies provide detail of such complacence. According to the research most of the companies are mainly focuses on award and rewards given, disclosure of employee stock option scheme, info about safety and security, employee welfare activities and performance appraisal.

The outcome of the study is limited to the analysis of the annual report of 15 companies in IT sector and 15 companies from manufacturing sector in

India. It provides a further scope of extensive study by taken companies from a wider group of industries from manufacturing and the IT sector.

TCS Limited and Infosys positions the most elevated among the IT Sector with fourteen percent factors falling under TCS and Infosys, trailed by Tech Mahindra falling under twelve percent section and KPIT under 11.5% section. Rest alternate organizations fall under 10% section which determines that lone few of them make revelations of their HR actualities and Data significant for general society and out of the individuals who unveil; they uncover just immaterial measure of data or ambiguous data

HR Department of any organization handles the interior clients which draw in the outer clients to make a buy or participate in purchasing exercises. In this manner it is found subsequent to dissecting the outcomes that Information which is topic of representatives and prizes frameworks and strategy is not revealed out in the Annual Reports of the Company.

In spite of the fact that such revelations require not to be made as it involves morals yet these organizations can unveil effect of such arrangements on the representatives of the organization to help the productivity after some time. In spite of the fact that a few revelations are made through Annual Reports however larger part of that either has a place with statutory necessities or is favoring its showcasing activities.

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## ANNEXURE

S. No	List of Companies	Website
IT Companies		
1	TCS Ltd	<a href="http://www.dqindia.com/dq-top20-meet-indias-top-30-it-companies/">http://www.dqindia.com/dq-top20-meet-indias-top-30-it-companies/</a>
2	Infosys	<a href="http://www.dqindia.com/dq-top20-meet-indias-top-30-it-companies/">http://www.dqindia.com/dq-top20-meet-indias-top-30-it-companies/</a>
3	Wipro	<a href="http://www.dqindia.com/dq-top20-meet-indias-top-30-it-companies/">http://www.dqindia.com/dq-top20-meet-indias-top-30-it-companies/</a>
4	Tech Mahindra	<a href="http://www.dqindia.com/dq-top20-meet-indias-top-30-it-companies/">http://www.dqindia.com/dq-top20-meet-indias-top-30-it-companies/</a>
5	HCL	<a href="http://www.dqindia.com/dq-top20-meet-indias-top-30-it-companies/">http://www.dqindia.com/dq-top20-meet-indias-top-30-it-companies/</a>
6	Polaris	<a href="http://www.dqindia.com/dq-top20-meet-indias-top-30-it-companies/">http://www.dqindia.com/dq-top20-meet-indias-top-30-it-companies/</a>
7	NIIT	<a href="http://www.dqindia.com/dq-top20-meet-indias-top-30-it-companies/">http://www.dqindia.com/dq-top20-meet-indias-top-30-it-companies/</a>
8	Persistent	<a href="http://www.dqindia.com/dq-top20-meet-indias-top-30-it-companies/">http://www.dqindia.com/dq-top20-meet-indias-top-30-it-companies/</a>
9	KPIT	<a href="http://www.dqindia.com/dq-top20-meet-indias-top-30-it-companies/">http://www.dqindia.com/dq-top20-meet-indias-top-30-it-companies/</a>
10	Zensar	<a href="http://www.dqindia.com/dq-top20-meet-indias-top-30-it-companies/">http://www.dqindia.com/dq-top20-meet-indias-top-30-it-companies/</a>
11	Mphasis	<a href="http://www.dqindia.com/dq-top20-meet-indias-top-30-it-companies/">http://www.dqindia.com/dq-top20-meet-indias-top-30-it-companies/</a>
12	Mindtree	<a href="http://www.dqindia.com/dq-top20-meet-indias-top-30-it-companies/">http://www.dqindia.com/dq-top20-meet-indias-top-30-it-companies/</a>
13	Blue Star Infotech	<a href="http://www.dqindia.com/dq-top20-meet-indias-top-30-it-companies/">http://www.dqindia.com/dq-top20-meet-indias-top-30-it-companies/</a>
14	L&T Infotech	<a href="http://www.dqindia.com/dq-top20-meet-indias-top-30-it-companies/">http://www.dqindia.com/dq-top20-meet-indias-top-30-it-companies/</a>
15	Oracal	<a href="http://www.dqindia.com/dq-top20-meet-indias-top-30-it-companies/">http://www.dqindia.com/dq-top20-meet-indias-top-30-it-companies/</a>
Manufacturing Companies		
1	Ashok Leyland	<a href="http://business.mapsofindia.com">business.mapsofindia.com</a>
2	Bajaj India	<a href="http://business.mapsofindia.com">business.mapsofindia.com</a>
3	TVS	<a href="http://business.mapsofindia.com">business.mapsofindia.com</a>
4	Hero	<a href="http://business.mapsofindia.com">business.mapsofindia.com</a>
5	Bombay Dyeing	<a href="http://business.mapsofindia.com">business.mapsofindia.com</a>
6	Asian Paint	<a href="http://business.mapsofindia.com">business.mapsofindia.com</a>
7	Bharat Petroleum	<a href="http://business.mapsofindia.com">business.mapsofindia.com</a>
8	HUL	<a href="http://business.mapsofindia.com">business.mapsofindia.com</a>
9	Jindal Steel	<a href="http://business.mapsofindia.com">business.mapsofindia.com</a>
10	Maruti	<a href="http://business.mapsofindia.com">business.mapsofindia.com</a>
11	Godrej Group	<a href="http://business.mapsofindia.com">business.mapsofindia.com</a>
12	Raymond Group	<a href="http://business.mapsofindia.com">business.mapsofindia.com</a>
13	Amul	<a href="http://business.mapsofindia.com">business.mapsofindia.com</a>
14	Cipla	<a href="http://business.mapsofindia.com">business.mapsofindia.com</a>
15	Dabur India Pvt. Ltd.	<a href="http://business.mapsofindia.com">business.mapsofindia.com</a>



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# The Actuarial Aging of Italian Veterans of World War I born between 1889 and 1900 and A Comparison to the Cohorts Born during the Years Immediately Following

By Carlo Maccheroni

*University of Turin*

**Abstract-** This paper develops a comparative analysis of the results provided by two different approaches: the “human actuarial senescence”, and the demographic approach about mortality in old age in order to see how much living conditions in young age influence the survival in the last years of life.

In particular, a case will be examined which had already been recorded, though not with regard to Italy. It concerns specifically the cohorts born between 1889 and 1900; where the men involved took part directly in World War I (1915-1918), while the women and the rest of the population experienced the harsh conditions of life at home.

As evolutionary theories predict that ageing will evolve according to the pattern of externally imposed hazards to survival, the Gompertz model has been chosen because it takes into account the legacy of living conditions in youth and adult ages.

**Keywords:** *World War I, mortality, Gompertz, actuarial senescence, aging rates, birth-cohort life tables, demography.*

**GJMBR-G Classification:** *JEL Code: N3*



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*Strictly as per the compliance and regulations of:*



# The Actuarial Aging of Italian Veterans of World War I born between 1889 and 1900 and A Comparison to the Cohorts Born during the Years Immediately Following

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**Abstract-** This paper develops a comparative analysis of the results provided by two different approaches: the “human actuarial senescence”, and the demographic approach about mortality in old age in order to see how much living conditions in young age influence the survival in the last years of life.

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As evolutionary theories predict that ageing will evolve according to the pattern of externally imposed hazards to survival, the Gompertz model has been chosen because it takes into account the legacy of living conditions in youth and adult ages. Moreover the parameters of the Gompertz model are used for the construction of two indexes both indicated as “rates of aging” that are used to describe actuarial senescence: Ricklefs’ aging rate measure ( $\omega$ ) and mortality rate doubling time (MRDT).

Our analyse focuses on mortality from age 85 onwards, and so Gompertz parameter estimates may have a preliminary interpretation according to the evolutionary approach, as far as men are concerned. Having said that, it is difficult to understand why the results of the two indexes mentioned above show such strong difference in the decrease of the two aging measures. Most likely we can say that  $\omega$  index cannot be considered an aging rate measure.

The conclusion is that current lifestyle changes and medical interventions, which are responsible for recent evolution in late-age mortality, require a revision of the traditional human actuarial senescence approach.

**Keywords:** World War I, mortality, Gompertz, actuarial senescence, aging rates, birth-cohort life tables, demography.

## 1. INTRODUCTION

When Gompertz(1825) formulated his “universal law of human mortality”, which later became famous, he could not have imagined that it would have become an important tool to measure the aging process, not only of the human population, but also for experimental applications in species of animals and, more generally, in the bio-demographic approach to mortality modelling (Kirkwood, 2015).

In time, other models were introduced although the Gompertz model never lost its luster because it continued to play an important role in the development of theoretical hypotheses in relation to the patterns of mortality at old ages. This method has connections to the evolutionary theory of senescence (Rose, 1991; Tuljapurkar, 1997; Ricklefs and Scheuerlein, 2002) and examines the increase in mortality hazard at older ages because of differential increased physiological vulnerability due to environmental conditions during pre-adult ages. This process is referred to as “actuarial senescence” or “actuarial aging” and the actuarial method supplies the so-called aging measures; these are obtained, among others, through the parameters of the model used to describe the course of actuarial senescence.

Within this framework, the present paper studies the actuarial method for life table analysis. The results can be different depending on the approach used to study the phenomenon: A period or a cohort approach. In the first case the level of mortality is influenced by the conditions “of the moment”, whilst the second case brings to light the long-lasting effects of living conditions experienced from pre-adult age.

It is exactly on these latter aspects that this work focuses by examining a particular period in Italian history. It is a critical examination of both the approach and the explanation of the results provided by the actuarial method for life table analysis by cohorts and regards the mortality of young Italian adults who experienced the impact of World War I (W W I). This applies both to the soldiers who fought on the war front and to the women who remained at home or at work and suffered hardships.

This paper will compare the evolution of the mortality of the older survivors aged 85 or more with the process of actuarial senescence experienced by the cohorts that were born later. The results also provide insight for analysis of differential mortality according to gender measured by the gap between average lengths of life. The corresponding female birth-cohorts too, like the rest of the civilian population, suffered the extreme conditions and severe restrictions imposed by the war

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economy in order to support those who were at the war-front. In the Appendix there is a brief historical digression that may help to focus on this aspect (also see the relevant bibliography: Schaumann, 1993).

The birth-cohorts studied here are those born during the period from 1889 to 1919. This choice is obviously conditioned by the statistical data available (Istat, 2002) that does not give a complete picture of the mortality rates of all the male cohorts engaged in the conflict. Nevertheless, out of the cohorts examined, those that were born between 1889 and 1899 are the ones who suffered the experience of war to a much greater extent.

## II. MATERIALS AND METHODS

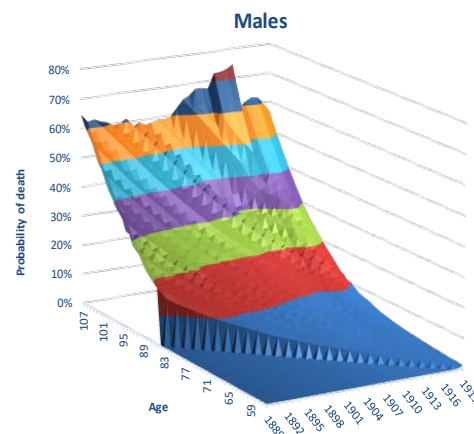
In recent years, the mortality analysis of extinct cohorts of WWI veterans born after 1889 was based on death probabilities that in Italy Istat<sup>1</sup> has provided since 1974 in the time series of period life tables. As is known, there is also the HMD source, but its data regarding the period of interest for the present study presents a lower quality for the period 1872-1905, as HMD (2015) clearly specifies. Therefore, the HMD source will not be used directly, because that work could lead to consider also the differential mortality by gender at old ages, which is a subject that has already been studied (Maccheroni, 2014) using Istat period life tables. As a consequence, the comparisons of the results obtained from period life tables and birth cohort-related life tables refer to the same source.

For several years, the study of mortality among the elderly population in Italy has found a more robust database than in the past because the demographic change was characterised by an intense process of population aging that began with a rapid decline in fertility and an accelerated reduction in mortality. As a result, there has been a steady increase of the elderly (Preston *et al.*, 1989). According to a recent study (Bonarini, 2009), in Italy the census of 1971 revealed that there was already a considerable number of centenarian women and this number increased progressively with the generations born after 1881<sup>2</sup>; on the other hand, the number of centenarian men grew at a much slower pace.

Despite this, it is not advisable to assume that it is possible to get enough data from the population to construct the probability of death and period life tables for those aged over 100; this especially applies to the 1970s and 1980s. There are, however, graduation methods (Thatcher, Kannisto, Vaupel, 1998) which enable to extrapolate the probability of death for the age group for which the available data are uncertain. Istat, which has so far built only period life tables, followed

this approach to determine the probabilities of death at elderly ages. Presently this Institute provides the homogeneous 1974-2014 time series where period life tables end at age 119 (demo.istat.it); obviously, this ultimate age is older than the oldest age in the population. In the birth cohorts tables that have been rewritten starting from the previous ones, the ultimate age considered is the one after which the number of survivors in the table is less than 1. The ultimate age for men is 108<sup>3</sup> years up to the 1900-birth cohort, and 109 years for the following cohorts. Conversely, women ultimate age is 109 years up to the 1892 birth cohort, and 110 years for the following cohorts (Kannisto, 1994). As already specified, the actuarial aging study affected cohorts born from 1889 until 1906, already extinct in 2014. Hence, all the related probabilities of death were obtained by processing Istat 1974-2013 time series. The aim of this work is also, however, to understand the effects of the war and of the Spanish flu on cohorts born in those years and to compare these results with them of cohorts born during the years preceding those events. It is for this reason that the life tables of cohorts born between 1907 and 1919 were closed with an extrapolation made according to the Gompertz model [1] since those cohorts were not yet extinct in 2014.

As a first step, the Gompertz model was fitted to mortality data from age 85 onwards (Vaupel *et al.*, 1998) in order to study the actuarial aging for cohorts born between 1889 and 1906, and some very satisfying results were obtained (see R<sup>2</sup> in table 1, following paragraph). It is precisely from these results that one proceeds to adapt and to extrapolate the [1] to the following cohorts, which leads to conclude the birth cohort life table with a minimal addition for the 1907 cohort and with consistently greater integrations for the others, up to and including the 1919 cohort.



<sup>1</sup>Italian National Institute of Statistics - Istat.

<sup>2</sup>On 13 May 2016 the oldest Italian person died. She was a 116 year-old woman.

<sup>3</sup>According to records, the longest living survivor of the World War I died at the age of 108 years and belonged to the 1899 birth cohort.

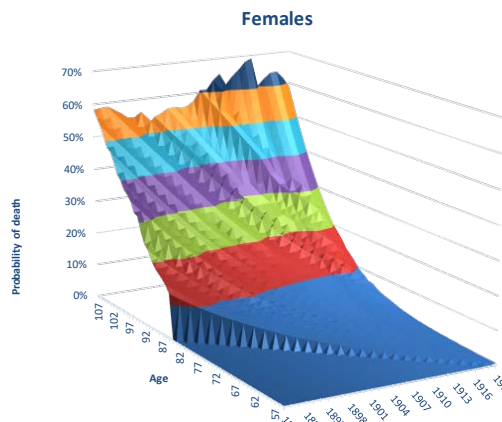


Fig. 1: Probabilities of death ( $q_x$ ) in Italian cohorts born between 1889 and 1919 from ages 55 on (cohort 1919) to 85 on (cohort 1889)

Our reconstruction of the extinction process of all the considered birth cohorts are shown in figure 1, in which the profile of the varying probabilities of death according to age and cohort highlights a general and progressive decline. There were also, however, certain years in which the health of the elderly suffered particularly. Reference is made here, in addition to what happened in 1983, especially to the consequences of the hot summer of 2003 that led in both cases to a net increase in mortality from diseases connected with the circulatory and respiratory systems (Istat, 2011). In figure 1, the effects of these changes are visible beginning with those born in 1919 and aged 84 and continuing up to those born in 1904 and aged 99.

Figure 2 gives us a preview of some of the results under study in the following paragraphs. Here it is evident that those who were born during the war experienced a much higher old age mortality than those who were born immediately before or after this period. In fact, the rise in the mortality profile for both males and females clearly show this phenomenon, known as the cohort effect. Moreover these findings suggest that the Spanish flu epidemic didn't influence the survival in later life of those who were born at the end of the war. There is a similar "hump" in the  ${}_5q_{85}$  profile (fig. 2), particularly regarding females: it relates to the generations born between 1892 and 1897; these women were young adults during the war and they probably suffered more than men did from the very poor living conditions, which may have led to poor health status in later life.

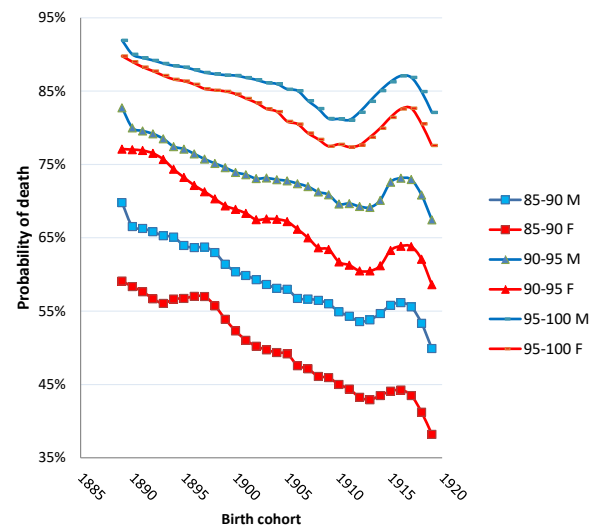


Fig. 2: Cohort probabilities of death within a five-year period ( ${}_5q_x$ ) at selected ages, by gender and year of birth

The effect of the end of W W I emerges for people who in those years were on the threshold of adulthood - those born between 1898 and 1902 - and who therefore experienced more rapid decline in mortality than the cohorts born before. At age 85 the mortality ( ${}_5q_x$ ) decreases quickly for both genders and in particular for women. Fig. 2 also gives evidence of a "selection" effect in the case of 90 and 95-year-old survivors, because in these cases the effect of severe living conditions throughout the war period is not visible for the cohort mortality born between 1889 and 1900.

As mentioned, in Italy the present day aging of the population is caused not only by the decline of fertility, but it is also part of a profound change in the death rates at advanced ages (Vaupel, 2010) whose trajectories have for many years been characterised by a continual decline in pace. Obviously it was not so in the past. Between 1960 and 1980, life expectancy at age 60 for men remained stationary, whilst life expectancy for 80 year olds even slightly decreased between 1970 and 1980. It is during this period that the birth cohorts that in youth or adulthood experienced the wartime conditions with its uncertainty, suffering and deprivation, either died out or reached very advanced ages. In order to focus on their mortality, the Gompertz model <sup>4</sup> was chosen from among the available models as it has been widely employed to represent senescent mortality (Pollard and Valkovics, 1992; Olshansky and

<sup>4</sup>Another model employed for studying actuarial aging is the Weibull one, not considered here because it implies, amongst other notions, that the causes of death of young adults and of the elderly are independent. The Weibull model also describes better the mortality for purer, single causes-of-death, while the Gompertz model is better for describing 'all-causes' of deaths (Juckett, Rosenberg, 1993; Gavrilov, Gavrilova, 2001).



Carnes, 1997) and it takes into account the legacy of living conditions in youth and adult ages as illustrated below.

The model (Kirkwood, 2015) describes the increase of the mortality hazard, expressed by the instantaneous rate or the force of mortality  $\mu(x)$ , by increasing age  $x$ ; it results in a mortality trajectory that reflects the increasing vulnerability of individuals because of declining physiological functions with aging. The formalisation of Gompertz's hypothesis about instantaneous rates leads to the following expression for the force of mortality

$$\mu(x) = \mu_a \exp(\gamma x) \quad [1]$$

where  $\mu_a$  and  $\gamma$  are constant. The first is also known as initial mortality rate (IMR) (Finch *et al.*, 1990) and  $a$  is the age starting from which  $\mu(x)$  grows exponentially; the second, i.e. the mortality increase rate, describes how this vulnerability increases by increasing age. Equation [1] should therefore apply starting from early adult life, but for more recent cohorts it generally best fits data pertaining to the over 80's. In order to graphically represent [1] from an arithmetic point of view, a transformation of  $\mu(x)$  is used and, as such,  $\ln \mu(x)$  appears as a straight line by increasing  $x$ ,  $\ln \mu_a$  is its intercepts and  $\gamma$  is its slope: this is the term with which  $\gamma$  is often indicated.

For a long time evolutionary biology has studied the questions of why senescence occurs and Gompertz therefore represents one of the fathers of this discipline because with his model he went beyond the empirical observations about patterns of mortality in order to attribute biological significance to life tables. Between this discipline and the evolutionary theory of senescence there are obviously large intersections; the latter proposes, among other things, a substantial partition of total mortality in extrinsic and intrinsic (Carnes and Olshansky, 1997; Carnes *et al.*, 2006); this partition does not claim to be exhaustive but to support the experimental analysis. The former, being the consequence of external or violent causes, is age-independent and accounts for most pre-adult mortality; the latter is age-dependent. At the origin of extrinsic mortality there are, in fact, external causes such as environmental disasters, famine, severe climatic conditions and war, as in the case considered. Instead, intrinsic mortality is the result of the decline of the physiological functions of an individual.

For both disciplines here cited, the Gompertz model [1] thus incorporates the two components of mortality with these two parameters: the extrinsic one with  $\mu_a$  – typical of the pre-adult or young adult ages – and the intrinsic one with  $\gamma$ , the expression, at advanced ages, of vulnerability that is also the legacy of the past. Hence, [1] implies that the increase in mortality rate by increasing age represents increasing vulnerability due to external causes suffered by young adults. On this point, it is worth considering that epidemiologists too

suggested the idea that early life experiences have an impact on health and mortality in later life (Kuh and Davey Smith, 1993).

The real significance of the word “early” in those contexts is not exactly the same for all the authors. Consequently, this approach presents a margin of arbitrariness from an applicative point of view: on the one hand  $\mu_a$  is defined as an age-independent term, on the other hand, when [1] is adapted starting from the adult age,  $\mu_a$  is associated with extrinsic mortality. In the latter case, references to social age concepts such as adulthood or old age could be reconciled; these may vary from society to society and may change over time, with the results of a mathematical model that describes the relationship between “chronological” age and mortality rates within an age group, whose threshold is still conventional. The estimates of the parameters for the same cohort will therefore vary depending on the age groups to which the model fits.

Broadly speaking IMR is a scale or level parameter or background mortality rate affecting every members of all cohorts at all ages and then raising or lowering the mortality curve. Depending on the case, this level of mortality can be associated with hazard present in the history of the entire cohort, which in the present case is actually observed.

To fit [1] to the cohort life tables, the probabilities of death  $q_x$  (fig. 1) were converted into instantaneous rates of mortality  $\mu_x$  which can be conveniently approximated as

$$\mu_x \approx -\ln(1 - q_x)$$

The parameter estimates of  $\mu_a$  and  $\gamma$  were obtained through the software STATA by using the OLS estimation method based on the log-arithmetically transformation of  $\mu_x$ ; as mentioned in the previous paragraph, the results of the adaptation have been very satisfying as can be observed by the index  $R^2$  (tab. 1).



Table 1: OLS estimation results\*: Cohorts 1889-1906

	Cohorts (males)					
	1889	1890	1891	1892	1893	1894
$\gamma$	0.073886***	0.073809***	0.074235***	0.074462***	0.074501***	0.074886***
	(0.001)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)
$\ln(\mu_a)$	-7.935739***	-7.937706***	-7.991789***	-8.025734***	-8.043428***	-8.094778***
	(0.072)	(0.043)	(0.050)	(0.058)	(0.069)	(0.076)
$R^2$	0.99819	0.99874	0.99861	0.99847	0.99825	0.99773
	Cohorts (males)					
	1895	1896	1897	1898	1899	1900
$\gamma$	0.075690***	0.075748***	0.075774***	0.075956***	0.077600***	0.078728***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
$\ln(\mu_a)$	-8.183682***	-8.203756***	-8.216080***	-8.246453***	-8.423901***	-8.545794***
	(0.093)	(0.107)	(0.099)	(0.108)	(0.081)	(0.077)
$R^2$	0.99723	0.99682	0.99714	0.99681	0.99772	0.99792
	Cohorts (males)					
	1901	1902	1903	1904	1905	1906
$\gamma$	0.079182***	0.080014***	0.081084***	0.083278***	0.084939***	0.086772***
	(0.001)	(0.001)	(0.001)	(0.002)	(0.003)	(0.002)
$\ln(\mu_a)$	-8.600322***	-8.690346***	-8.798875***	-9.015774***	-9.175651***	-9.365443***
	(0.082)	(0.075)	(0.123)	(0.184)	(0.231)	(0.210)
$R^2$	0.99773	0.99772	0.99605	0.99269	0.98816	0.98644
	Cohorts (females)					
	1889	1890	1891	1892	1893	1894
$\gamma$	0.080707***	0.080726***	0.081174***	0.081539***	0.081289***	0.080699***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
$\ln(\mu_a)$	-8.693334***	-8.708316***	-8.768037***	-8.821850***	-8.815806***	-8.774603***
	(0.187)	(0.165)	(0.183)	(0.209)	(0.232)	(0.227)
$R^2$	0.98693	0.98880	0.98907	0.98887	0.98874	0.98988
	Cohorts (females)					
	1895	1896	1897	1898	1899	1900
$\gamma$	0.080333***	0.079190***	0.078718***	0.079880***	0.082702***	0.084639***
	(0.002)	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)
$\ln(\mu_a)$	-8.751082***	-8.658132***	-8.627242***	-8.756773***	-9.050620***	-9.254461***
	(0.194)	(0.220)	(0.155)	(0.119)	(0.114)	(0.101)
$R^2$	0.99232	0.99062	0.99323	0.99439	0.99469	0.99518
	Cohorts (females)					
	1901	1902	1903	1904	1905	1906
$\gamma$	0.086411***	0.088008***	0.088879***	0.090675***	0.092254***	0.094545***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)
$\ln(\mu_a)$	-9.442470***	-9.610262***	-9.701209***	-9.878808***	-10.036298***	-10.277337***
	(0.095)	(0.097)	(0.100)	(0.137)	(0.144)	(0.135)
$R^2$	0.99552	0.99555	0.99588	0.99483	0.99417	0.99358

\*Robust standard errors in parenthesis. Significance levels: \*\*\*p<0.01, \*\*p<0.05, \*p<0.10.

### III. RESULTS AND DISCUSSION

Even though these analyses focus on mortality from age 85 onwards, rather than adult ages onwards, parameter estimates may have a preliminary interpretation according to the evolutionary approach, especially evident as far as men are concerned.

With regard to IMR estimates, and apart from the mortality level that they provided, IMR shows, comparatively, the highest values for those born until 1897 (tab. 2), thus registering a high mortality that may be linked to the hardships of the wartime. As a matter of fact, from a comparison with cohorts born after 1900, for which the estimates are much lower and IMR steadily declining (tab. 1), it can be deduced that with the passing of time the long-lasting deleterious effects of war on cohorts with range of birth dates from 1889 to 1899 did not disappear.

The IMR model-based estimates show, obviously, lower levels for women than for men, although the strong correlation among genders (Pearson's  $r = 0.929$ ) confirms the harshness of the wartime living conditions for civilians, in particular for the younger ones. As in the case of their male peers, similarly for women the highest values of IMR are in fact those of cohorts born during the 1889-1897 period. This aspect will be analysed later on.

In addition, the slope time series regarding male and female are highly correlated with each other ( $r = 0.958$ ). Actually for female birth cohorts born after 1897 and for male ones born after 1898 (tab. 2 and fig. 3 B) there is a turning point, after which the slope increases faster. However, this is not related to the magnitude of mortality rates at different ages: from cohorts born 1898 onwards – especially for women – the level of mortality,  $\bar{I}_{85}(\mu)$  [4], decreases quickly, as can be observed in fig. 3 E and tab. 2. For these cohorts, the upward trend of  $\gamma$  (fig. 3 B) reflects a stronger intensity of natural selection by increasing age (Hawkes *et al.*, 2011), since they endured a weaker selection than previous cohorts from birth to young-adulthood and therefore show a greater heterogeneity in later life with respect to frailty.

The comparison between IMR – the background mortality rate – and slope estimates is in line with the former remark: in fact, there is a strong negative correlation between IMR and slope estimates ( $r = -0.969$  for males and  $r = -0.976$  for females), which is confirmed by the results in tab. 2. Also fig. 4 – which is related to the slope – provides an inverted image of the IMR profile (figures 3A and B), particularly evident in the case of women.

These cases were already known as Strehler and Mildvan (1960) correlation pattern, they have been fully discussed in the literature (Yashin *et al.*, 2001; Hawkes *et al.*, 2011), but they only regarded ages between 35 and 80.

The parameters of the Gompertz model [1] are used for the construction of two indexes both indicated as “rates of aging” (Ricklefs and Scheuerlein, 2002) or aging measures, which are independent from age. One of these indexes is known as mortality rate doubling time (MRDT) and it is a  $\gamma$  transformation [2], the other one is the so-called  $\omega$  index.

*Table 2:* Parameter estimates of the Gompertz model, aging indicators (MRDT and  $\omega$ ) and a summary index of mortality from age 85

Cohorts	IMR	Slope	MRDT	$\omega$	$\bar{I}_{85}(\mu)$
			Males		
1889	0.000358	0.073886	9.381255	0.005141	0.4468
1890	0.000357	0.073809	9.391080	0.005133	0.4426
1891	0.000338	0.074235	9.337164	0.005011	0.4369
1892	0.000327	0.074462	9.308800	0.004934	0.4317
1893	0.000321	0.074501	9.303914	0.004892	0.4257
1894	0.000305	0.074886	9.256069	0.004780	0.4197
1895	0.000279	0.075690	9.157736	0.004597	0.4150
1896	0.000274	0.075748	9.150663	0.004553	0.4090
1897	0.000270	0.075774	9.147560	0.004525	0.4050
1898	0.000262	0.075956	9.125617	0.004463	0.3999
1899	0.000220	0.077601	8.932251	0.004128	0.3925
1900	0.000194	0.078728	8.804351	0.003912	0.3873
1901	0.000184	0.079183	8.753793	0.003817	0.3832
1902	0.000168	0.080014	8.662780	0.003669	0.3795
1903	0.000151	0.081084	8.548518	0.003498	0.3775
1904	0.000121	0.083278	8.323303	0.003181	0.3756
1905	0.000104	0.084939	8.160558	0.002965	0.3757
1906	0.000086	0.086772	7.988134	0.002726	0.3716
			Females		
1889	0.000168	0.080707	8.588461	0.003679	0.4045
1890	0.000165	0.080726	8.586461	0.003652	0.3992
1891	0.000156	0.081174	8.539040	0.003554	0.3927
1892	0.000147	0.081539	8.500764	0.003468	0.3855
1893	0.000148	0.081289	8.526970	0.003473	0.3786
1894	0.000155	0.080699	8.589344	0.003532	0.3727
1895	0.000158	0.080333	8.628445	0.003566	0.3683
1896	0.000174	0.079190	8.752997	0.003709	0.3620
1897	0.000179	0.078718	8.805402	0.003755	0.3710
1898	0.000157	0.079880	8.677312	0.003546	0.3807
1899	0.000117	0.082702	8.381283	0.003115	0.3731
1900	0.000096	0.084639	8.189425	0.002846	0.3673
1901	0.000079	0.086411	8.021506	0.002617	0.3622
1902	0.000067	0.088008	7.875965	0.002429	0.3633
1903	0.000061	0.088879	7.798765	0.002332	0.3582
1904	0.000051	0.090675	7.644286	0.002156	0.3562
1905	0.000044	0.092254	7.513432	0.002010	0.3559
1906	0.000034	0.094545	7.331423	0.001804	0.3499

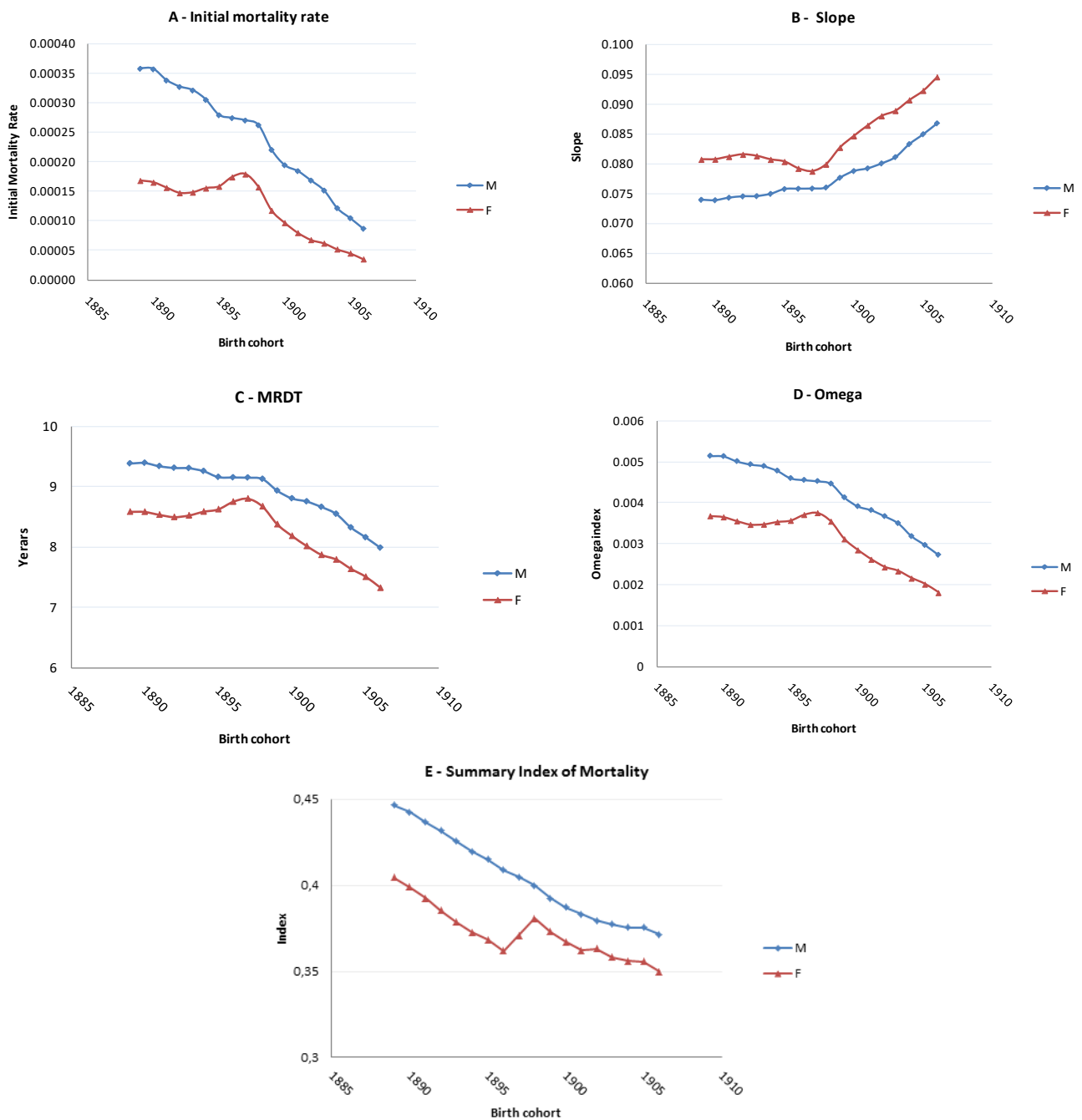


Fig. 3: Trends in initial mortality rate (A), slope (B), MRDT (C),  $\omega$  (D) and (E) summary index of mortality among men and women for Italian birth cohorts between 1889 and 1906

Let us examine the first,  
 $MRDT = \ln 2 / \lambda$

This index indicates after how many years the risk of death tends to double. In human populations MRDT usually should be included between 7 and 8.5 years (Finch *et al.*, 1990), which respectively identify a situation of low and high mortality (Gurven and Fenelon, 2009). Unfortunately, this statement is not correct because low or high mortality depends on mortality rates, even if there could be a relationship between an aging measure [2] and a summary index of mortality [4], as will be seen later on.

As shown in fig. 3 C and in tab. 1, there are some important differences between genders.

In the case of males, cohorts born between 1889 and 1898 show MRDT values slightly above 9: they are the generations that were between 17 and 26 years of age at the beginning of the war. The MRDT trajectory declines slowly until the 1897 birth cohort, then the decrease stops up to the cohort born in 1898. The 1897-1899 cohorts were sent one after other to the war front in the most dramatic period of the conflict, after which the successive generations experienced a gradual reduction in actuarial aging.

As regards females, MRDT values are all within those of the previous range – i.e. between 7 and 8.5 years – but the index grows after an initial decrease, it reaches its maximum precisely with the cohort born in 1897, and then it starts to decrease again (fig. 3-C). This trend highlights the important contribution offered by women in all fields: they, as all those who were not on the war front, had to substitute men in all jobs and activities. The cohorts of men born between 1874 and 1900 were gradually called to arms, even though only the youngest were involved in military operations. About five million men thus left their productive work, which is why women were called to fill up the resultant vacancies, mostly in farming and factories. They too were subject to food rationing and experienced a decrease in their purchasing power due to the taxation levied to finance the war. They were deprived of health care because almost all the medical staff was concentrated at the war front.

Thinking of wartime, one usually thinks of soldiers, their courage, their struggles, their hard conditions and pains, but seldom thinks of women, who were strongly involved in war too and experienced all hardships, thus feeling the effects of war tragedies.

It should also be noted that the Italians' living conditions had already worsened previously, because the war started in Europe the year before had had serious repercussions on the economy even in the other non-belligerent countries. Moreover, to make things still worse, a devastating earthquake had hit a wide area of central Italy in January 1915.

The years following the war were hard too and the period life tables highlighted an increase in female mortality at puberty age (Pinnelli, Mancini, 1997), the cause for which lies in their low standard of living. The other index is the so-called  $\omega$  index

$$\omega = \sqrt{\mu_a \gamma} \quad [3]$$

which is a geometric mean between two rates and hence it is a rate itself.

The results of [3] are also in line with expectations and their trajectories present a profile, which is very similar to MRDT (figures 3 C and 3 D).

Nevertheless, for a comparative analysis between these two measures of the rate of aging it is necessary to consider that they are strongly correlated with the parameters of model [1]: more particularly tab. 3 reveals that, for both males and females, the Pearson correlation between  $\mu_a$  and  $\omega$  is practically 1, and it is almost 1 between  $\mu_a$  and MRDT. On the contrary,  $\gamma$  with  $\omega$ , and  $\gamma$  with MRDT, are strongly negatively correlated with each other (tab. 3).

Tab. 3: Pearson's correlation coefficients between Gompertz estimates and aging measures

	IMR ( $\mu_a$ )	Slope ( $\gamma$ )	MRDT	Omega
Males				
IMR ( $\mu_a$ )	1	-0.969	0.979	0.995
Slope ( $\gamma$ )		1	-0.999	-0.988
MRDT			1	0.994
Omega				1
Females				
IMR ( $\mu_a$ )	1	-0.976	0.983	0.996
Slope ( $\gamma$ )		1	-0.999	-0.989
MRDT			1	0.992
Omega				1

Consequently (tab. 3) MRDT and  $\omega$  are highly correlated to each other ( $r > 0.99$  for men and women), nevertheless this strong relationship masks two different patterns of actuarial aging decline over time.

Actually, if both measures show that the substantial actuarial aging decrease begins with the cohort born in 1898, the MRDT decline between 1897 and 1906 is only 12.7% for males and 16.7% for females, whilst decreases of 39.8% and 52% are obtained from  $\omega$ , which are over three times higher. There are therefore two very different measures of the changes in the rates of the actuarial senescence, which is difficult to be explained as it regards just  $\omega$ , unless one refers to its relation with  $\mu_a$ , whose decrease in that period was also very substantial: 68.3% and 80.8% respectively for males and females. Let us examine the relation between  $\mu_a$  and  $\omega$ .

By construction,  $\omega$  is the geometrical mean between  $\gamma$  and  $\mu_a$  [3]; in the present case,  $\mu_a$  is always smaller than  $\gamma$  (tab. 2). If one denotes by  $\omega^*$  the arithmetical mean between  $\gamma$  and  $\mu_a$ , according to the properties of the means (Hardy, Littlewood, Polya, 1964), the following relation is worth

$$\mu_a < \omega < \omega^* < \gamma$$

Consequently,  $\mu_a$  has the greater weight on  $\omega$  and the strong relationship between  $\mu_a$  and  $\omega$  indirectly confirms this fact (tab. 3). This result gives rise to doubts as to whether  $\omega$  can be used as the rate of relative aging in the age group here considered.

Instead, the variation in the MRDT level depends on the  $\gamma$  trajectory that increases with the decrease in mortality (Hawkes *et al.*, 2011); the use of a summary index of mortality confirms that. The chosen index was proposed by Schoen (1970) who recommended the geometric mean of the age-specific mortality rates as a summary index of considerable value. This index is here referred to as  $\bar{I}_{85}(\mu)$ , that is



$$\bar{I}_{85}(\mu) = \sqrt{\prod_{i=85}^{x_{\max}-86} \mu_i} \quad 85 < x < x_{\max} \quad [4]$$

where  $x_{\max}$  is the last age and  $i = 85, 86 \dots (x_{\max}-1)$ .

Indeed, as our analyses show (tab. 3), the relationship between  $\gamma$  and  $\bar{I}_{85}(\mu)$  is negative for males ( $r = -0.88$ ), whereas for women this inverse relationship is evident from the birth cohort 1898 onward ( $r = -0.687$ ), where their mortality levels began to decline continuously.

Fig. 3 A and fig. 3 E show the association of  $\bar{I}_{85}(\mu)$  with the values of background mortality ( $\mu_a$ ), which is very strong in the case of males ( $r = 0.968$ ), less strong in the case of females ( $r = 0.727$ ). This happens also because the aging-related mortality in the Gompertz model [1] increases exponentially as a multiple of  $\mu_a$ .

#### IV. A DEMOGRAPHIC FOCUS ON MORTALITY RATES: MEAN REMAINING LIFETIME AFTER AGE 85

A review of the previous findings concludes by crossing them with those of the perhaps best known indicator of the mortality level which is precisely the birth cohorts average length of life; it is here indicated by  $e_{85c}$  to distinguish it from  $e_{85p}$  which is the corresponding period life expectancy. We begin with a comparison of the aging measures, which concern only cohorts born between 1889 and 1906; however, as regards the average length of life the analysis covers a longer time span.

##### a) Mean lifetime in cohorts born between 1889 and 1906

As already stated, these birth cohorts completely died out and the relative life tables were reconstructed entirely based on Istat database. The case of women whose temporal sequences of aging measures are characterised by two phases is especially evident in figures 3 C and 3 D. In the first, an initial slight decrease of  $\omega$  and MRDT is followed by a sharp turnaround in tendency between the birth cohorts of 1894 and 1897, when the actuarial aging reaches its maximum. The second phase is characterised by a continued sharp decrease of the indexes. In the case of males, there is only one break in the trend of decrease, always circumscribed around the generation born in 1897. Again, as to women,  $\bar{I}_{85}(\mu)$  shows an increase in mortality for birth cohorts from 1896 to 1898 too (fig. 3 E), but it has only a little effect on  $e_{85c}$ . Indeed there are no signs of these reversals in the trend of the mean life span, but only a gradual slowing down (fig. 4) after an initial growth, precisely for cohorts born from 1894 to 1897. However, the remaining lifetime increased slowly: from one generation to another with respect to

those born between 1889 and 1906, the average increase is approximately fifteen days for both genders.

The legacy of war is also evident from the comparison between the evolution of  $e_{85c}$  and  $e_{85p}$ . Fig. 4 shows that the cohort effect was lower for those born up to 1897 with respect to those born afterwards: their  $e_{85c}$  was slightly higher than the corresponding  $e_{85p}$  by approximately one month and a half both for males and females. Conversely, for those born after 1897 the increases were much higher, especially for women. The latter in fact benefited more during the last few years of their existence from the progress made in living conditions since the early 80s, both with respect to the past and with respect to the men, as shown by the gap with the corresponding period life expectancy (fig. 4). Consequently, the gap between mean residual lifetimes increased tending to be higher than that which emerges from the comparison of life expectancies.

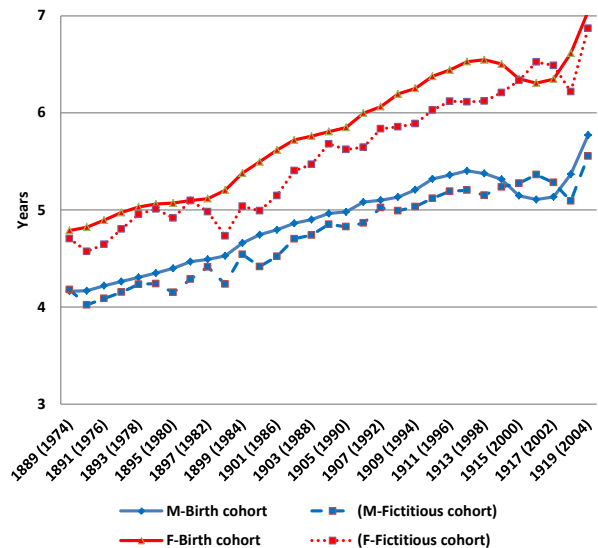


Fig. 4: Average number of years actually lived after 85 from birth cohorts and corresponding remaining life expectancy of fictitious cohorts at the same ages. Italy, males and females

One of the most recent studies (Rogers *et al.*, 2010) shows that the lower incidence of cardiovascular diseases in women, with consequent lower mortality, is due to the positive action of female sexual hormones on blood fat levels. However, this protection ceases after menopause and hence social and environmental factors, in particular the family, educational and working environments, determine the mortality differences at all ages, also indicated as main causes (Maccheroni, 2014). The study of women's life paths who reached these ages led to identify a further explanation of higher longevity in women: their psychology, which leads them to build social and solidarity networks in a much more efficient way than men do. Thanks to their different way of relating to the external world, women show a higher capacity to adapt to life's changes, to life's various

stages and to changing human relationships (Cesa Bianchi, 2000).

In order to carry out an analysis of mortality for the cohorts whose range of birth dates 1907-1919, it was necessary to close the related life tables by extrapolating a logarithmic transformation of [1] at late ages. This is because the high values of the  $R^2$  suggest that also in their case the regression model fits well, and they validate its use for predictive or forecasting purposes.

The results display another consequence of the war that both living male and female groups have in common:  $e_{85c}$  of individuals born between 1915 and 1918 shows a severe decrease which reaches its minimum with the birth cohort of 1916; thereafter only with respect to those who were born after 1917 does the decrease lessen rapidly (fig. 4). It might also be observed that men belonging to these cohorts took part in World War II in pre-adulthood, so that even in their case the consequences of that event could affect their mortality at older ages. However, the perfect synchronism that characterises the  $e_{85c}$  trajectories for both males and females (fig. 4) minimises such consequences greatly.

The bases of these findings are to be linked to the rise in mortality in the extreme age groups that had already been disclosed by the temporal sequences of the probabilities of death given in fig. 2. It is only for the individuals born in 1919 that the average length of life realigns itself on the temporal trend prior to the beginning of the war. This occurs even though about half of those born during the widespread Spanish flu epidemic which, in Italy in its acute phase, raged between autumn 1918 and early summer 1919<sup>5</sup>; according to the chronicles, in its early phase the epidemic struck above all the soldiers on the front before spreading nationwide (Melegaro and Alfani, 2010).

#### b) Mean life time in cohorts born between 1907 and 1919

These latest findings indicate how a sudden and adverse change in the living and environmental conditions experienced at the time of birth of these generations can have negative repercussions on their mean remaining lifetime (Barker, 1994) even at older ages. Moreover the increase in infant mortality during the years of the conflict, which ceases precisely in 1919, as illustrated in tab. 4, provides a further element of proof, albeit indirectly, of the deterioration of living conditions.

In this particular case, there was a prolonged deterioration of living conditions. On the contrary, the war of 1911 between Italy and Turkey, although involving a considerable number of men and much equipment, was limited in duration, so the increase in infant mortality in that year (tab. 3) was not accompanied by a decrease in the mean remaining lifetime in the ages here examined for the ones born in that period.

<sup>5</sup>Before the Spanish flu epidemic there had been a serious epidemic of cholera in 1884-1885.

Tab. 4: Deaths before age 1 year per 1,000 live births; Italy, 1910-1920

	1910	1911	1912	1913	1914	1915	1916	1917	1918	1919	1920
Males	146.4	162.7	135.2	145.8	137.2	153.7	174.5	159.2	194.4	134.4	132.1
Females	133.3	150.4	120.4	130.2	123.1	139.7	157.7	146.8	180.1	123.6	120.9

Source: Istat, *L'Italia in 150 anni. Sommario di statistiche storiche 1861-2010, 2011, Roma.*

It should however be noted that, in the past, there had been other cases in which the adverse environmental conditions did not lead to what has now been highlighted in relation to the war in 1915-1918. A comparison of almost the same ages can be done with the results of a study of cohorts born in Finland during the great famine of 1866-1868. Here the findings pointed out that their mean remaining lifetime at 80 years of age was not less than that of birth cohorts born either five years before or five years after the famine (Kannisto, Christensen, Vaupel, 1997). In the case under study, the war situation and related family and social interactions affected pregnant mothers and those with very young children. These found themselves alone whilst their husbands were on the front, in a different way from those who lived during the famine in Finland, thus experiencing this different cohort effect on later life mortality (fig. 2).

In the case examined, statistics alone do not allow for speculation on why pregnancies during the war and the conditions under which the births took place in Italy had such drastic effects on long-term health and hence on mean remaining lifetime of these cohorts (Elo, Preston, 1992).

## V. CONCLUSIONS

The Gompertzian aging model provided a good fit to the mortality rates of the birth cohorts that have herewith been examined, thus making it possible to perform a comparative analysis of both the role assigned to the parameters and of the aging measures ([2] and [3]) proposed by the actuarial aging or senescence.

The evolution of the model-based estimates of parameter  $\mu_a$  clearly highlights that for cohorts born between 1889 and 1900, on the threshold of 85, the negative legacy of environmental conditions determined by the war had not been cancelled out still. Such negative effects affected, albeit in a different selective way, both males and females. On the contrary, for those born after 1900 who experienced remarkable improvement in their living standards, the background mortality saw a steady decline, that resulted in a decrease of rates of senescence. Hence it appears that the well-known William's hypothesis (1957) - according to which "low adult death rates should be associated with low rates of senescence, and high adult death rates

should be associated with high rates of senescence"<sup>6</sup> - is supported also in this case (tab. 1).

Yet, it should be noted that demographic analyses revealed that the Gompertzian pattern is valid only for a part of the human life course. Recent studies have shown that human mortality rates do not continue to accelerate at very advanced ages, but rather decelerate (Vaupel et al. 2010), thus contradicting equation [1], where the slope quantifies the constant age-dependent acceleration of the mortality rate.

Moreover, from findings provided by the aging measures across the birth cohorts, some critical issues emerge that influence negatively the heuristic component of this type of research, when referred to human mortality.

The trajectories of  $\omega$  and MRDT concerning cohorts born after 1899 highlight two different reductions of actuarial aging that  $\omega$  amplifies significantly; so one cannot say which measure is better because there are no criteria for choosing between them.

The question is whether today extrinsic mortality still plays a role in driving the evolution of aging in societies with low-mortality rates, also because of the difficulty to distinguish clearly between "external" and "intrinsic" forces that influence vital rates. The social environment strongly affects human lifespan: the improvements in medical care, the prevention of major death causing diseases and changes in life-style have minimised both the infant and the pre-adult age mortality rate, which is almost exclusively extrinsic and above all caused by road accidents. At advanced ages, one far-reaching consequence was the deceleration of the process of deterioration by increasing age and the related mortality postponing (Vaupel et al., 2010) that involved a distinction among early, middle and late old age too.

Another great revolution is taking place in our societies, whose objective is not an increasing longevity but rather a longevity without disabilities and functional dependence.

The combination of medical research, new therapies introduced by biotechnology and progress in molecular nanotechnology and artificial intelligence (www.a4minfo.net) will not stop the aging process, but it could however lead to a reassessment of old age with respect to how it is currently considered. These interventions are at the origin of the biological processes

<sup>6</sup>Evolution, Volume 11, Issue 4, (Dec. 1957), p. 404.

of the “natural” deteriorating of the physiological functions leaving room for a kind of ‘manufactured survival’. Thus, there could be an impact on the mortality pattern at older ages, so the assumptions underlying the application of the models used for the study of the actuarial aging could be undermined.

#### *Appendix: A historical outline*

In Europe on the eve of World War I two alliances met face-to-face, the Triple Entente (United Kingdom, France and Russia) and the Triple Alliance (Austria-Hungary, Germany and Italy); the latter was of a defensive nature and guaranteed military support to whichever ally came under attack by another State. As is widely known, the conflict began with Austria-Hungary declaring war on Serbia (July, 28<sup>th</sup> 1914), which was followed just a few days later by Germany's declaration of war on France and Russia; after that, one declaration of war succeeded another at a frantic pace, thereby ushering in the enormous catastrophe that continued until November 11<sup>th</sup> 1918.

Since the expected conditions foreseen by the alliance to intervene in the war were lacking, Italy declared itself neutral, however, it came under strong pressure to support the war effort from two sides. As we know, in the end Italy deployed its troops in favour of France and the United Kingdom. This decision was not only due to the concessions that these two countries guaranteed in the case of victory, but also to a more widespread popular sentiment in favour of these two countries on the one hand, as well as to general sentiments of protest towards the political choice of an alliance with Austria and Germany on the other hand. Moreover, it is necessary to highlight that the birth and building of Italy as a unitary State originated from three wars (1848, 1859 and 1866), known as the Wars of Independence, fought precisely against Austria for the liberation of most of the Italian territories that were then part of the Austro-Hungarian Empire.

Once Italy decided on war in support of France and the United Kingdom, the Italian general headquarters did not proceed immediately with a general mobilisation but rather chose a preliminary individual call to arms to avoid suspicion from the Austrian government. So when the war started on May 24<sup>th</sup> 1915 the initial operations were conducted by those who were already enrolled or had been released a short time before, which especially included cohorts born in the years prior to 1895, because in those times all men were conscripted to the army for two years upon reaching twenty years of age. However, besides having recalled the cohorts born in and up to the year 1875, by the autumn of 1916 the army proceeded to bring forward the enrolment of the cohort born in 1897. This happened again to those born later, up until the year 1900.

The war initially gave some victories to the Italian army, but early in the fall of 1917, the first phase of the October Revolution gave rise to the conclusion of military operations on the Russian front and this allowed Austria-Hungary and Germany to concentrate their forces on the Western Front. Consequently the Italian army suffered a dramatic defeat (October 1917) at Caporetto and was forced to withdraw to the Piave River. The subsequent Italian victory at this position, where the Austrian advance was stopped, led a little later to the collapse of the Austro-Hungarian Empire and the end of the war in November 1918. According to Italian government sources of the time the deaths were 651,000 and the wounded admitted to hospitals were 1,050,000. Approximately 70% of those deaths belong to the cohorts born between 1889 and 1900 (Jdanov, Glej, Jasilionis, 2010) and as such, this paper studies their mortality in accordance with the actuarial senescence method. It should also be noted that 28.6% of deaths (186,000) were due to diseases from the harsh environmental conditions on the front; until around the end of 1917 the war was fought in the Alps, in some stretches of the front at high altitudes, with the risk of frostbite and in the general risk that diseases such as tuberculosis and rheumatic fever could become chronic. After the defeat of Caporetto, the war epicentre moved largely to the plains, along the Piave River, where there were malarial areas, and in the end, it was in this environment that also the Spanish flu epidemic spread (Alfani and Melegaro, 2010).

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## Effective Utilization of Employee State Insurance (ESI) Policy at E-Publishing Sector

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**Abstract-** Employee State Insurance (ESI) Scheme is a very large social security. It is different from other types of insurance like Health Insurance that it provides full amount of medical bill irrespective of the premium contribution. The purpose of the study is to analysis the awareness and satisfaction with the level of Utilization of Employee State Insurance (ESI) policy. The study also attempt to review the various Employee State Insurance (ESI) benefits available to the Employees. The research paper is to find the effects of utilization of Employee State Insurance(ESI) policy using various statistical tool through SPSS software.

**Keywords:** *ESI, employee satisfaction, social security benefits.*

**GJMBR-G Classification:** *JEL Code: G22*



*Strictly as per the compliance and regulations of:*



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**Abstract-** Employee State Insurance (ESI) Scheme is a very large social security. It is different from other types of insurance like Health Insurance that it provides full amount of medical bill irrespective of the premium contribution. The purpose of the study is to analysis the awareness and satisfaction with the level of Utilization of Employee State Insurance (ESI) policy. The study also attempt to review the various Employee State Insurance (ESI) benefits available to the Employees. The research paper is to find the effects of utilization of Employee State Insurance(ESI) policy using various statistical tool through SPSS software.

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## I. INTRODUCTION

The promulgation of the ESI Act by the Parliament in 1948 was the first major legislation on social security for workers in India. The Act envisages protection to workers in the organized sector in the case of sickness, maternity and death or disability due to injury at work. Based on the principle of pooling of risks and resources, this health insurance scheme provides medical facilities to beneficiaries and cash compensation for loss of wages or earning capacity while in service. The ESI Act applies to non-seasonal factories or manufacturing units employing ten or more people in a power using factory and twenty or more people in a non-power using factory. Employees drawing wages of up to Rs.10,000 per month (as on Jan 2009) are currently entitled to a health insurance scheme. However the wage ceiling for the purpose of coverage is revised from time to time. To increase the coverage the ESI Act has also been extended gradually to other establishments such as shops, hotels and restaurants, road and motor transport undertakings, newspaper establishments and cinema halls. The ESI Act however, is not applicable to factories or establishments run by the State Governments/Central Government whose employees receive other social security benefits.

Under the ESI scheme, employees contribute 1.75% of their wages and the employers contribute 4.75% of the wages of eligible beneficiaries/employees

towards premium payments. Employees earning less than Rs. 50 per day are exempted from contribution towards premium payments. The contributions made by the employees and the employers are deposited in a common pool known as the ESI Fund, which is used for meeting administrative expenses as well as cash and medical benefits to insured persons (IP) and their dependents. The state governments, as per the ESI Act, contribute 12.5% of the total expenditure (within the per capita ceiling of Rs.1000 per annum) incurred by the ESIC on medical care in respective states.

## II. REVIEW OF LITERATURE

A.J Patel (1972), Secretary to the Government of Gujarat, in a letter to the Member-Secretary, Committee on Perspective Planning, Employees' State Insurance Corporation, New Delhi, pointed out that the standard of medical care provided under the Employees' State Insurance Scheme is at present low on account of inadequate ceiling prescribed by the Employees' State Insurance Corporation. If the Government of India starts contributing towards the Employees' State Insurance Scheme, it may be possible to improve the standard. He also mentioned that in view of the restraint on the financial resources of the State Government, it is not possible for it to agree to give financial assistance to the Employees' State Insurance Corporation by way of grants/loans for the construction program.

K. Mohanachandran (1972), Secretary to the Government of Kerala, in a letter to the Member-Secretary, Committee on Perspective Planning, the Employees' State Insurance Corporation, New Delhi, pointed out that it may not be possible for the State Government to give financial assistance to the Employees' State Insurance Corporation. The financial assistance in the form of grant or loan may come from the Central Government. He also suggested that the 'No claim bonus scheme' is to be introduced very soon. This will be an incentive to those employees who do not avail of any benefit under the Employees' State Insurance Scheme.

K.V. Rajappan Nair (1988), Director, Employees' State Insurance Corporation Regional Office, Trichur, Kerala commented that the level of utilization of physical infrastructure available in various hospitals and dispensaries under the Employees' State Insurance Scheme in Kerala is very low due to factors such as

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increase in administrative expenses per insured person, non-availability of specialists and non-availability of any arrangement for availing the service of qualified known part-time specialists. Even the equipment provided in the hospital is not being maintained properly, thereby causing difficulties in providing better service to the Employees' State Insurance beneficiaries.

G.K. Suresh Babu (1990) stated that the authorities of the ESI Corporation consider the ESI Scheme as a sort of industry driven primarily by profit motive, whereas it has to be regarded essentially as a great social security Scheme. Consequently, the authorities are keen on reducing amenities and benefits available to employees. This is obvious when we examine the statistics released by the Corporation itself. In the financial year 1987-88, the Corporation had sanctioned Rs.62.68 lakhs in the category of monetary benefits to employees that was reduced to Rs.53.89 lakhs in 1988-89: Percentage-wise, the beneficiaries were reduced from 1 to 0.88. In fact, the National Institute of Health and Family Welfare, after a comprehensive study in 1985 had recommended a minimum of Rs.300 yearly, subject to 15 percent increase every succeeding year, to every employee for health care.

Valsamma Paul (1995), in her study, suggested that the ESI Act, 1948 and the Rules may be amended, binding the employers to provide the employees with necessary information about the employment injury benefits available under the ESI Act, 1948 and the formalities for obtaining the same. This will help the illiterate employees, especially the casual ones avail of employment injury benefits. She also suggested that administration of medical benefit should be undertaken by the Employees' State Insurance Corporation from the State Government.

G. Ramanujam (1996), Veteran trade unionist and the former Governor of Orissa, had voiced his concern about the shoddy working of the ESI hospitals. In a statement, he said "labor has been all along complaining about the poor quality of medical benefits under the Employees' State Insurance Scheme. The medical services are run by the State Government hospitals. These hospitals are qualitatively poor. I would appeal to ESI Corporation to directly run its own hospitals all over the country to provide better treatment". He had also suggested if the Employees' State Insurance Corporation were not in a position to run the hospitals in a professional manner, the Corporation must grant exemption liberally wherever the workers and the employers jointly approach for such exemption.

B.K. Gupta (1997), former Insurance Commissioner of the Employees' State Insurance Corporation, pointed out that the Employees' State Insurance Scheme is the country's major multidimensional social insurance programme that has over the last four and a half decades emerged as the

largest social security set up in South-East Asia with a phenomenal coverage and an infrastructure that has no parallel. The ESI Act as on date is applicable to over two lakhs industrial units, across the length and breadth of the country. In the ESI Scheme, employer is the only link between the administrative machinery and its service system on one hand and the workers on the other hand. The admissibility and straight flow of benefits to the deserving is, by and large, determined by the level of employers' involvement in this welfare measure, and its functional aspects.

S. Thomas (2005), the editor of 'ESI Samachar', says despite all the endeavors made by the Corporation for the effective functioning of the ESI Scheme in the country, the public perception of the Corporation has not been very positive. The Employees' State Insurance Corporation is a service organization and admittedly, there are pockets of inefficiency, which, to a certain extent, is expected as well. Improving the quality of service at the ground level as is demanded in all for a of discussions is a must. A mechanism should be devised to gauge the satisfaction level of the beneficiaries so that performance gaps are identified and remedial measures taken.

G. Muthu Lakshmi (2014) conducted a study on the performance of Employees state insurance scheme with special reference to Tuticorin district, Tamilnadu. The study scrutinizes the performance of ESI Corporation and also the perception of employees on ESI hospitals. The primary data were analyzed with the help of various statistical measures such as simple percentage analysis, Averages, F-statistic, Chi-square test, Garrett ranking and percentage analysis. The study found out that ESI dispensaries/hospitals were not functioning up to the satisfaction of insured persons. The study also reveals the scope to improve its functions and turn into a highly trustful and reliable corporation, implementing better services.

### III. NEED FOR THE STUDY

- To know about the Importance of Employee State Insurance (ESI) policy at E-publishing sector.
- To view the level of maturity towards the Employee State Insurance (ESI) policy.
- To study on the concern benefits utilized by the employee in organization.
- The preference given within the organization rules & regulations.

### IV. OBJECTIVE OF THE STUDY

- To understand the level of Awareness towards Employee State Insurance (ESI) Policy.
- To find out the Level of Satisfaction of the beneficiary employee towards Employee State Insurance (ESI) Policy.
- To evaluate the level of utilization of Employee State Insurance (ESI) Policy.



## V. RESEARCH METHODOLOGY

The process used to collect information and data for the purpose of making business decision. The methodology may include publication research, interview, survey, and other research technique and put include both present and historical information. "A research design is an arrangement of condition for collection and analysis of data in a manner that aims to combine relevance to research purpose with economic in procedure". Descriptive research studies are those studies which are concentrated with delivery the

characteristics of a particular individual group. A descriptive research studies is concentrated with specific prediction with narration of facts and characteristics concerning individual group or situation. A group of individuals that share one or more characteristics for which data can be gathered and analyzed is population there are total 200 employees working in the organization. An optimum sample is one which fulfills the requirement of efficiency, representativeness, reliability, and flexibility. Size of the sample was taken 137. The Tools to be used in the study is Chi-Square and Correlation analysis.

## VI. DATA ANALYSIS AND INTERPRETATION

Demographic profile of the respondents is as follows:

*Table 6.1:* Demographic Profile of Respondents

Characteristics	Frequency	Percentage (%)
Gender		
Male	96	72.2
Female	37	27.8
Age ( in years)		
Below 30	44	33.1
31-40	71	53.4
41-50	10	7.5
Above 50	8	6.0
Work experience ( in years)		
1-3	43	32.3
3.1-6	56	42.1
6.1-9	20	15.0
More than 9.1	14	10.5
Income (in Rupees)		
Below 10,000	47	35.3
10,001-15,000	69	51.9
15,001-20,000	10	7.5
More than 20,000	7	5.3

The following will be data analysis and interpretation using chi-square and correlation technical calculation proceeding as follows:

### a) Chi-Square Analysis

Marital status and Every Employee utilizes the ESI policy at least once in a year.

#### Hypothesis

$H_0$  - There is no relationship between marital status and every employee utilizes the ESI policy at least once in a year.

$H_1$  - There is relationship between marital status and every employee utilizes the ESI policy at least once in a year.

*Table 6.2:* Tabulation of Pearson Chi-Square Test

Particulars	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	11.494 <sup>a</sup>	4	.022
Likelihood Ratio	11.853	4	.018
Linear-by-Linear Association	1.332	1	.248
N of Valid Cases	133		

Marital status and Every employee utilize the ESI policy at least once in a year.

From the SPSS output, it is generated that the significant value is less than 0.05, therefore null hypotheses is rejected and alternate hypotheses is accepted. In the above obtained result value is 0.022

#### b) Correlation Analysis

**Table 6.3:** Correlation Analysis between Need of the employee state insurance policy and all employees fulfilled with the ESI policy in my company

Particulars		Need of the employee state insurance policy.	All employee fulfilled with the ESI policy in my company.
Need of the employee state insurance policy.	Pearson Correlation	1	.029
	Sig. (2-tailed)		.740
	N	133	133
All employee fulfilled with the ESI policy in my company.	Pearson Correlation	.029	1
	Sig. (2-tailed)	.740	
	N	133	133

It is to analyses of correlation between Need of the employee state insurance policy and all employee fulfilled with the ESI policy in my company. From the table 6.3, it is clear that the organization fulfills employee needs towards ESI policy is highly correlated with a

so, reject the null hypothesis. Hence, there is relationship between marital status and every employee utilizes the ESI policy at least once in a year.

correlation coefficient value of 0.029 and there is positively correlated. From the correlation analysis, it is inferred that the organization is perfectly fulfilling employee need towards ESI policy.

**Table 6.4:** Tabulation of Correlation

Particulars		Rate the level of utilization of ESI policy is high in company.	Insured person under ESI policy avails the super-specialty treatment.
Rate the level of utilization of ESI policy is high in company.	Pearson Correlation	1	-.186*
	Sig. (2-tailed)		.032
	N	133	133
Insured person under ESI policy avails the super-specialty treatment.	Pearson Correlation	-.186*	1
	Sig. (2-tailed)	.032	
	N	133	133

It is to analyses of correlation between rate the level of utilization of ESI policy and avail of benefits. From the table 4.8, it is clear that the organization doesn't give much preference towards ESI policy is not correlated with a correlation coefficient value of -0.186 and there is negatively correlated. From the correlation analysis, it is inferred that the organization is not gives proper preferences towards ESI policy.

#### c) Finding of the Study

The study was made to found that the employee of the company are not fully educated about the Employee state Insurance (ESI) policy and the Employee are not fully benefited and from the study we found that Using Chi-Square analysis, there is relationship between marital status and every employee utilizes the ESI policy at least once in a year. From the correlation analysis, it is inferred that the organization is

perfectly fulfilling employee need towards ESI policy. Hence still need to focus on the utilization an Employee State Insurance (ESI) policy with the employee to make them attach with the organizations profit maximization.

#### d) Suggestion and Recommendation

- The company need to focus under the benefits of Employee State Insurance (ESI) policy to the Employee of the company.
- The Employee should be properly educated under the Employee State Insurance (ESI) policy.
- The Involvement in this Employee State Insurance (ESI) policy will have an impact under the productivity scale.

## VII. CONCLUSION

"The organization will be healthy only when the Employee and the Organization together have a growth

so that it will be Healthy Organization". The employee should have the aware about the Employee State Insurance (ESI) policy because it benefits the Employee Medically strong. The Verve Technologies should focus on the Employee Beneficiary policies. From this study it is inferred that majority of employees are not fully aware about ESI policy. Hence need to focus on Awareness and Utilization of ESI policy more familiar so that it will lead to High Productivity results in Healthy Organization.

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# Studies on the Organocapital Structures; Profitability and External Financing on Nigerian Manufacturing Firms (1990-2012)

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**Keywords:** capital structure, external financing and manufacturing firms.

**GJMBR-G Classification:** JEL Code: G20



STUDIES ON THE ORGANOCAPITAL STRUCTURES PROFITABILITY AND EXTERNAL FINANCING ON NIGERIAN MANUFACTURING FIRMS 1990-2012

*Strictly as per the compliance and regulations of:*





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## I. INTRODUCTION

Capital structure means various financing options available to firms to finance the activities of the firms. These financing options can be classified as either external or internal financing. The components of these sources of finance are equity, debt and or other financial facilities (Raheman *et al* 2007). Most firms attempt to have different levels of the mixtures of equity and debt in order to minimize cost and increase profits, so that the shareholders' value will be increased (Raheman *et al*). Leary and Roberts 2005 states that firms strive to maintain an optimal structure that balances the costs and benefits associated with varying degrees of financial leverage. Therefore, it is this methods or financing options available to firms that have given rise to various capital structure theories. These capital structure theories try to explain various relationships that exist between leverage and profitability. The optimal mix between equity and debts and determinants of corporate financed structure.

The earliest of such theories is modified Miller and Modigliani theory of capital structure irrelevance, (1958) which states that financing doesn't matter in perfect capital markets. According to the theorem, given

the assumption that 'firms and investors have the same financial opportunities, under conditions of perfectly competitive financial markets, no asymmetries of information between different agent and the same tax treatment of different forms of finance, the corporate financial policy is irrelevant.

Myers 2002 in analyzing MM theory, states that if market value of the firm's debt and equity add up to total firms value, then if firm value is constant, any mixture of debt and equity could be used, provided the assets and growth opportunities are held constant. That is that the proportion of debt or equity result is irrelevant. Myers went on to ask "are capital markets really sufficiently perfect?" Many studies had thrown more light on this issue.

Fabozzi *et al* (2012), states that under perfect capital market, capital structure decision is irrelevant and there is no optimal capital structure. And further stated that when perfect capital market assumptions are relaxed, then the capital structure matters. These conditions of capital markets are asymmetric information, tax advantage of debts, principal agent relation and transactions costs. There are various theories emanating from these conditions, such as Asymmetric Information theories, Agency theory, Pecking Order theory, and Trade-off theory etc. These theories consider various effects of corporate taxation on leverage, capital structure and financial distress and also their effects on profitability. Okafor (1983) identify that financial system consists of financial intermediaries, financial markets, financial rules, conventions and norms that help in the flow of funds in the economy. These enhance economic performance through facilitating allocation of capital and risk, thereby providing job creation, raising productivity growth rate with lower unemployment rate. Siglitz (2000) had identified that there is need for intervention in short term capital flows in the argument of capital market liberalization and instability. The issues are that capital structure, external financing affect the profitability of firms.

Prasad *et al* (2001) stated that there were three ways in which firm could fund new investments, through three main choices; use retained earnings, debt instruments or equity shares issues. The essence of these new investments is to generate income.

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Some studies have identified some differences between the components of capital structures of firms in developed and developing countries. In the developing economies, firm's capital mix is mainly equity and short-term debt. Yartey, (2008), or Abor (2008) in the study of Ghanaian firms, the Nigerian firms capital structure analysis, evidence from stock exchange fact book, show that their capital is mainly equity and short-term debts from Treasury bills.

The Khan (2010), in the exploration of the relationship of capital structure decision with the performance of the firms in the developing market economies like Pakistan found out that the relationship between financial leverage and firm performance measured by the return on assets has a significant and negative relationship with firm performance'. Asset size had insignificant relationship with the firm performance measured by ROA (Return on Assets). Firms in the engineering sector of Pakistan were largely dependent on short term debts, these debts were attached with strong covenants which affected the performance of the firms.

Saeedi and Mahmoodi (2010) investigated the determinants of capital structure of Iranian firms listed in Tehran stock exchange, the results indicated that leverage decreased with profitability, liquidity and tangibility while also increase with business risk.

The theoretical and empirical literature surveyed above shows the extent of the impact of external financing on performance of firms. While some studies reveal that external financing have positive impact on firm performance, others reveal that its impact on firm performance is negative and non-significant.

The opinion and findings of Asif, Rasol and Kamel (2011), Khan (2010), Elias, Flannery and Gerfinkel (2006), Linter (1962) suggest that some model proxies agreed that they have impact on firm performance. For instance, Asif, Rasool and Kamel (2011) were of the opinion that dividend policy vassely followed by firms has negative impact on dividend payment by high-debt firms. Khan (2010) shows that financial leverage measured by short-term debt to total assets, and total debt total assets has a significant and negative relationship with firm performance measured by return on assets.

The opinion and findings from the above show that there is no consensus reached on the impact of external financing on firm performance. This lack of consensus could be attributed to so many reasons. This includes the perception of investors on external financing in developing economies where investors view the use of external financing as a symptom of poor performance of firms. Also, the inability of cost firms to access funds from financial institution also inhibited firms ability to raise funds from external sources thereby limiting growth potentials.

Thus, taking cognizance of this lack of consensus and seeking to overcome some of the short comings as well as limitations noticed in the studies reviewed with particular emphasis on Abor (2008), this study fills this important gap by modifying Abor (2008) through introduction of a panel data set in determining the capital structure, external financing and profitability on performance of manufacturing firms in Nigeria and also including control variables such as firm size and assets structure in line with the works of Abor (2008) for the period 1999 to 2012.

## II. MODEL SPECIFICATION

The data was obtained from the published financial statement accounts of quoted manufacturing firms for the period 1999-2012. The study adopted Abor (2008) study to examine the impact of external finance on stock return of Nigerian firms. According to Abor (2008) panel data can control for individual heterogeneity due to hidden factors, which, if neglected in time-series or cross-section estimation leads to biased results, (Badi, 1995). The panel regression equation differs from a regular time series or cross-section regression by the double subscript attached to each variable. Therefore, the general form of the model for this study is specified as.

$$Y_{it} = a + \beta_1 X_{it} + \mu_{it} \text{-----} \quad (i)$$

The subscript *i* denotes the cross-sectional dimension and *t* representing the time series dimension. The left-hand variable *Y<sub>it</sub>*, representing the dependent variable in the model, which is the firm debt ratio. *X<sub>it</sub>* contains the set of explanatory variables in the estimation model, *a* is the constant and *B* represents the coefficient while *u* represents the error term.

However, in line with the hypothesis stated in the study, the model was specified as follows. For hypothesis one which stated that External Financing do not have positive and significant impact on earnings per share of Nigerian manufacturing firms. It was represented as;

$$EPS = a + \beta_1 EF + \beta_2 AS + \beta_3 FS + u$$

Where;

EPS = Earnings per share

EF = External Finance

AS = Asset structure

FS = Firm Size

For hypothesis Two which states that external financing do not have positive and significant impact on returns on equity of Nigerian manufacturing firms.

$$ROE = a + \beta_1 EF + \beta_2 AS + \beta_3 FS + u \text{-----} (iii)$$

ROE = Return on Equity.

EF = External Finance

AS = Asset structure

FS = Firm size

### Techniques of Analysis

The hypotheses stated were tested using the ordinary least square model. The signs and significance of the regression coefficients was relied upon in explaining the nature and influence of the independent and dependent variables as to determine both magnitude and direction of impact. Regression analysis is often concerned with the study of the dependence of one variable, the dependent variable on one or more other variables, the explanatory variables with a view to estimation and I or predicting the population mean or average value of the former in terms of known or fixed (in repeated sampling) values of the latter (Gujarati and Porter, 2009).

Most commonly, regression analysis estimates the conditional expectation of the dependent variable given the independent variables that is the average

value of the dependent variable when the independent variables are held fixed. Less commonly, the focus is on quartile or other location parameter of the conditional distribution of the dependent variable given the independent variables. In all cases, the estimation target is a function of the independent variables called the regression function. In regression analysis, it is also of interest to characterize the variation of the dependent variable around the regression function which can be described by a probability. (Gujarati, 1995).

## III. PRESENTATION AND ANALYSIS OF DATA

### a) Presentation of Data

Data are presented and interpreted in line with the objectives of the study. The abridged annualized ratio values to test the hypothesis are presented in tables 4.1.

Table 4.1: Model Proxies

OBS	COMPANY NAME	EXF	EPS	DPS	POR	ROA	ROE	LogAS	SZ
1	Uac Plc	0.16	1.99	1.1	1.81	0.1	0.12	7.83	6.5
15	Arbico	0.16	0.73	0		0.09	0.11	6.09	4.71
30	Cappa&D'alberto Plc	0.16	2.57	0		0.64	0.76	6.06	5.7
45	Costain	5.02	0.03	0		0.4	0.16	5.13	4.52
60	G. Cappa	0.16	0.41	0		0.01	0.01	6.94	4.71
75	Roads Nigeria	0.16	3.66	0.5	7.32	0.1	0.12	6.07	4.86
91	Uacn Property	0.16	1.69	0.55	3.07	0.05	0.06	7.69	6.36
104	Dn Tyre & Rubber Plc	0.16	0.09	0		0.15	0.18	6.79	5.59
109	Champions Breweries	0.16	1.37	0		0.32	0.38	6.43	6.09
119	Golden Brewries	0.16	2.27	0		0.19	0.23	6.47	5.66
134	A.G Leventis	0.16	0.29	0		0.06	0.07	7.1	5.81
148	Chellarams Plc	0.16	0.3	0.1	3	0.08	0.09	6.63	5.34
162	John Holts	0.16	2.63	0		0	0	7.01	4
176	Scoa Nigeria Plc	0.16	0.33	0.08	4.13	0.22	0.26	6	5.33
190	Transcorp	0.32	0.21	0		0.18	0.26	7.6	6.73
195	Dangote Cement	0.45	0.07	0		0.3	0.36	8.52	8.03
200	Dn Meyer Plc.	0.4	0.73	0		0.09	0.14	6.39	5.37
214	First Aluminium Nigeria Plc	0.18	1.59	0		0.04	0.04	6.91	5.52
228	Ipwa Plc	0.14	11.61	0		0.33	0.39	5.37	4.78
243	Lafarge Cement Wapco Nigeria Plc	0.31	1.63	0		0.06	0.09	8.12	7.69
248	Paints & Coating Manufactures Nigeria Plc	3.11	0.13	0		0.54	-0.26	5.3	5.03
253	Vitafoam	1.67	0.63	0.3	2.1	0.37	-0.89	6.34	5.71
267	Vono Product	0.3	1.32	0		0.18	0.25	6.35	5.6
281	Pz Cuzzons	0.17	1.67	0.86	1.94	0.25	0.3	7.51	6.72
295	Unilever	0.22	1.11	0		0.4	0.41	7.18	6.62
309	Ekocorp Plc	0.17	0.06	0		0.03	0.03	9.19	7.47
325	Union Diagnostic And Clinical Services	0.13	0.04	0		0.11	0.12	6.29	5.2
330	Evans Medical	1.98	0.13	0		0.03	-0.18	6.32	3.94
345	Morrison Industries	0.26	0.22	0		0.07	0.1	5.68	4.52
359	Fidson Health Care	0.23	0.31	0.1	3.1	0.17	0.22	6.45	5.67
364	Pharma Deco	2.31	4.66	0		0.62	-1.71	5.87	5.67
380	Ashaka Cement	0.08	1.51	0.3	5.03	0.18	0.2	7.39	6.6
394	African Paint	0.02	0	0		0.03	0.03	5.66	4.16
399	Berger Paints	1.33	2.03	0		0.38	-1.16	6.14	5.65
413	Chemical And Allied	0.05	3.15	3	1.05	3.53	3.73	5.51	5.95
427	Cement Company Of Northern Nigeria	0.26	1.01	0		0	0	8.57	8.03
441	Utc Nigeria	0.17	0.06	0		0	0	6.42	4.9

455	Union Dicon Salt	0.05	0	0		0.15	0.16	6.18	5.34
470	Cadbury Nigeria	15.52	0.38	0		1.97	-0.17	6	6.07
484	Nestle Nigeria	0.88	19.08	0		0.35	0.56	7.72	7.1
498	Nigeria Enamelware	0.1	1.1	0		2.12	2.36	4.72	4.87
517	Beta Glass Company	0.09	2.95	0		0.16	0.18	7.06	6.17
526	Flour Mill	0.45	9.67	2	4.84	0.32	0.35	7.9	7.23
543	National Salt Company	0.88	0.62	0		0.62	5.25	6.52	6.22
552	P.S. Mandries Plc	0.03	0	0		0.24	0.25	5.11	4.46
558	Guinness	0.08	19.31	7.5	2.57	0.4	0.44	7.7	7.12
567	International Breweries	0.08	0.09	0		0.02	0.02	6.94	5.3
576	Nigeria Breweries	0.05	4.01	3.54	1.13	0.47	0.49	7.98	
585	7up	0.41	3.43	1.5	2.29	0.1	0.11	7.43	6.36
595	Dangote Flour Mill	0.07	0.54	0		0.18	0.2	7.73	6.73

Source: Nigerian Stock Exchange Factbook (Various Years)

Note: Obs = Observation, EXF = External Finance, EPS = Earnings per share, DPS = Dividend per share, POR = pay-out ratio, ROA = Return on Asset, ROE = Return on Equity, LogAS = Logarithm of Asset Structure, SZ = Size of Firm.

#### IV. DESCRIPTIVE STATISTICS

	EXF	EPS	ROE	LOGAS	SIZE
Mean	0.8425	6.3781	0.4148	6.3067	5.5348
Median	0.1600	1.6850	0.2600	6.2800	5.5348
Maximum	52.0100	70.0100	21.030	9.1800	7.8600
Minimum	0.0000	0.0100	-9.4200	3.8000	1.6000
Std. Dev.	4.2529	13.086	1.7547	1.0178	1.0095
Skewness	10.3723	3.1493	5.968	0.0768	-0.2269
Kurtosis	115.379	12.732	78.699	2.7068	3.2882
Jarque	146918	1511.95	6606.76	1.2325	3.2529
Probability	0.000	0.0000	0.0000	0.53999	1.1966

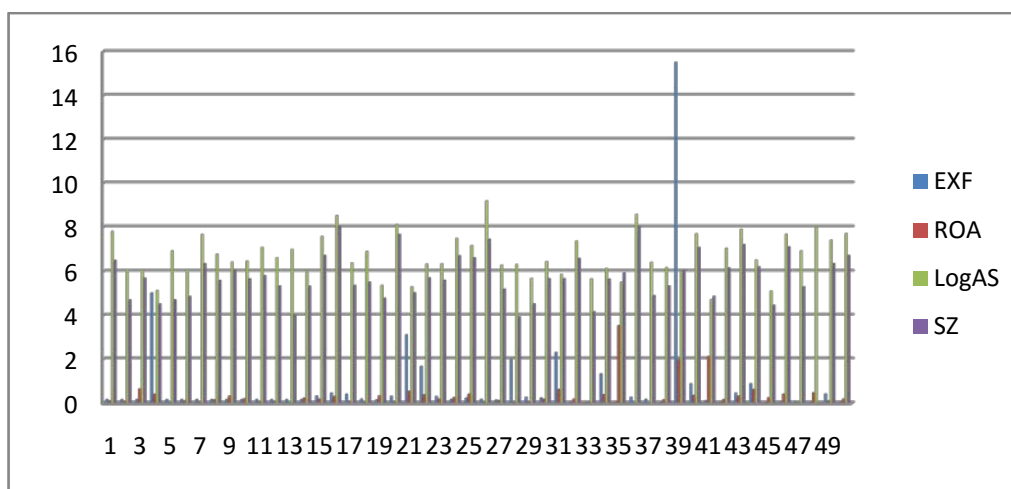
*Objective One; To examine the impact of external financing on the earnings per share of the quoted manufacturing firms in Nigeria*

Table 4.1 and 4.2 present the abridged data and descriptive statistics for the period 1999 to 2012. As revealed from the tables, it showed that the mean of the external finance of quoted Nigerian manufacturing firm was 0.8425 while the median was 0.1600. As revealed by the skewness, there was a positive skewness (10.37) of external finance indicating that the degree of departure from the mean of the distribution is positive revealing that overall there was a consistent increase in external finance from 1999 to 2012. Though as indicated by the Kurtosis which was  $115.37 > 3$  which is the normal value indicated that the degree of peakedness within the period of this study were not normally distributed as most of the value did not hover around the mean. The Jarque-Bera statistic is an indication of the normality of distributions was 146918 and since the probability was equal to zero, the distribution was not normally distributed.

From the table also, the average earning per share are 6.378 while the median was 1.685. The maximum earnings per share were N70.00 while the least was N0.01k. The standard deviation was 13.086. As revealed by the skewness, there was a positive skewness (3.149) of earnings per share indicating that the degree of departure from the mean of the

distribution is positive revealing that overall there was a consistent increase in earning per share from 1999 to 2012. As indicated by the Kurtosis which was  $12.732 > 3$  which is the normal value indicates that the degree of peakedness within the period of this study was not normally distributed as most of the values did not hover around the mean. The Jarque-Bera statistic is an indication of the normality of distributions was 1511.95 and since the probability was equal to zero, the distributions was not normally distributed.





*Objective two: To examine the impact of external financing the return on equity of the quoted manufacturing firms in Nigeria.*

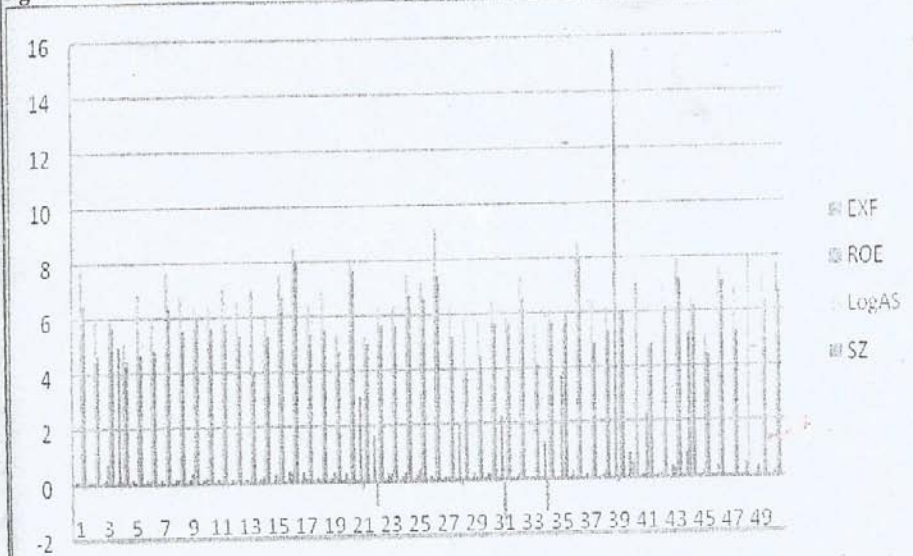
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As revealed from the tables, it showed that the mean of the external finance of quoted Nigeria manufacturing firms was 0.8425 while the median was 0.1600.,there was a positive skewness (10.37) of external indicating .that overall there was a consistent increase in external finance from 1999 to 2012.though as indicated by the Kurtosis which was 11.37> 3 which is the normal value indicates that the degree of peakedness within the period of this study was not normally distributed as most of the value did not around the mean. the Jarque-Bera statistic is an indication of the normality of distribution was 146918 and since the

probability was equal to zero,the distribution was not normally distributed.

From the table also the average return on equity is 0.415 while the median was 0.260. maximum return on equity was 21.03 while the minimum was -9.42 with a standard deviation of 1.75. As revealed by the skewness,there was a positive skewness of 5.96 indicating that the degree of departure from the mean of the distribution is positive revealing that overall there was a consistent increase in return on equity from 1999 to 2012. As indicate by the Kurtosis which was 78.70>3 which is the normal value indicates that the degree of peakedness within the period of this study was not normality of distributions was 66069.76 and since the probability was equal to zero the distribution was not normally distributed.

**Figure 4.5: External Finance, Return on Equity, Asset structure and Size**



Source: Researcher's E-view Result



*Test of hypothesis one*

$H_0$ : External financing does not have positive and significant impact on earnings per share of quoted Nigerian Manufacturing Firms.

$H_a$ : External financing has positive and significant impact on earnings per share of quoted Nigerian Manufacturing Firms.

## V. COMPARISON OF RANDOM AND FIXED EFFECT

*Table 4.3:* Presents the Hausman test summary result of the random and fixed effect

*Table 4.3:* Hausman Test Result Hypothesis one

	Coefficients			
	(b) fixed	(B) Random	(b-B) Difference	sqrt(diag(V_b-V_B)) S.E
EXF	-.0043609	-.010167	.0058061	.0089396
LogAS	-2.273572	-3.206971	.9333993	.5480008
SZ	1.557088	1.581759	-.0246711	.2830469

Source: researcher's Stata result

b = consistent under  $H_0$  and  $H_a$ ; obtained from xtreg

B = inconsistent under  $H_a$ , efficient under  $H_0$ ; obtained from xtreg

Test:  $H_0$ : difference in coefficients not systematic  
 $\chi^2(3) = (b-B)' [ (V_b - V_B)^{-1} ] (b-B)$   
 $= 2.98$   
 Prob >  $\chi^2 = 0.3941$

From the above, the null hypothesis is rejected since p-value > 0.05, hence, the random effect regression model was used to test hypothesis one.

## VI. ANALYSIS OF REGRESSION RESULT OF HYPOTHESIS ONE

*Table 4.4:* Presents the regression results of hypothesis one

Random-effects GLS regression Group variable: YEAR				Number of obs = 603 Number of groups = 19		
R-sq:   within = 0.0019 between = 0.1289 overall = 0.0042				Obs per group:   min = 1 avg = 31.7 max = 51		
corr(u_i, x) = 0 (assumed)				Wald chi2(3) = 2.51 Prob > chi2 = 0.4737		
EPS	Coef.	Std. Err.	z	P>   z	[95% Conf. Interval]	
EXF	-.010167	.0481042	-0.21	0.833	-.1044495	.0841155
LogAS	-3.206971	2.052298	-1.56	0.118	-7.229401	.8154581
SZ	1.581759	1.746439	0.91	0.365	-1.841198	5.004717
cons	20.43152	9.421277	2.17	0.030	1.966158	38.89688
sigma u	0					
sigma e	35.97919					
Rho	0	(fraction of variance due to u_i)				

Source: Researcher's Stata Result

As revealed from table 4.4, the impact of the external financing on earnings per share of quoted Nigerian manufacturing firms is negative and non-significant ( $a = -.01$ ,  $z = -0.21$ , p-value 0.833 > 0.05). This indicates that the use of external financing does not impact positively on the earning per share of Nigerian manufacturing firms. Overall, the coefficient of determination as revealed by R-square ( $R^2$ ) in between the firm was 12.8%. This indicates that the 12.8% of variation observed in the dependent variable earnings per share was explained by variation in the independent

variable external financing and the control variables (Asset structure and size). This is understandable given the level of observation in the panel. The Wald  $\chi^2$  which was 2.51 > 0.05 indicates that the F- test result of all the coefficient in the model are not different than zero. The random effect result which was equal to zero reveals that the differences across units are uncorrelated with the regressors. For the control variables, the results indicates that asset structure of quoted manufacturing firms in Nigeria also had negative and non-significant ( $a = -3.21$ ,  $z = -1.56$ , p-value 0.118 > 0.05) impact on

earnings per share while size of the firm had positive though non-significant ( $a=1.58$ ,  $z=0.91$ ,  $p\text{-value } 0.365 > 0.05$ ) impact on earnings per share

#### Test of Hypothesis Two

$H_{05}$ : External Financing does not have positive and significant impact on return on equity of quoted Nigerian manufacturing firms.

$H_{a5}$ : External Financing has positive and significant impact on return on equity of quoted Nigerian manufacturing firms.

## VII. COMPARISON OF RANDOM AND FIXED EFFECT

**Table 4.5:** Presents the comparison results of the random and fixed effect

**Table 4.5:** Hausman test result of Hypothesis two

	Coefficients			
	(b) fixed	(B) Random	(b-B) difference	sqrt(diag(V_b-V_B)) S.E
EXF	-.0023573	-.0026206	.0002633	.0004296
LogAS	-.3544257	-.3427512	-.0116745	.0265813
SZ	.2586032	.2637706	-.0051674	.0135227

Source: researcher's Stata result

b = consistent under  $H_0$  and  $H_a$ ; obtained from xtreg

B = inconsistent under  $H_a$ , efficient under  $H_0$ ; obtained from xtreg

Test:  $H_0$ : difference in coefficients not systematic

$$\chi^2(3) = (b-B)' [ (V_b - V_B)^{-1} ] (b-B)$$

$$= 2.98$$

$$\text{Prob} > \chi^2 = 0.3941$$

From above, the null hypothesis is rejected since  $p\text{-value} > 0.05$ , hence, the random effect regression model was used to test hypothesis five.

#### Analysis of Regression Result of Hypothesis Two

**Table 4.6:** Presents the regression result of hypothesis two

**Table 4.6:** Regression Result of Hypothesis Two

Random-effects GLS regression Group variable: YEAR				Number of obs	=	603
				Number of groups	=	19
R-sq: within	=	0.0212		Obs per group: min	=	1
between	=	0.2066		avg	=	31.7
overall	=	0.0211		max	=	51
corr(u_i, x)	=	0 (assumed)		Wald $\chi^2(3)$	=	12.88
				Prob > $\chi^2$	=	0.0049
EPS	Coef.	Std. Err.	z	P>   z	[95% Conf. Interval]	
EXF	-.0026202	.002355	-1.11	0.266	-.0072364	.0019951
LogAS	-.3427512	.100474	-3.41	0.001	-.5396767	-.1458257
SZ	.2637706	.0855002	3.09	0.002	-.0961934	.4313478
cons	1.115163	.461236	2.42	0.016	.2111565	2.019169
sigma u	0					
sigma e	1.7603527					
Rho	0				(fraction of variance due to u_i)	

Source: Researchers Stata Result

As revealed from the table 4.12, the impact of the external financing on return on equity of quoted Nigerian manufacturing firms is negative and non-significant ( $a=-0.002$ ,  $z=-1.11$ ,  $p\text{-value } 0.266 > 0.05$ ). This indicates that the use of external financing has negative and non-significant on the return on equity of Nigerian manufacturing firms. Overall, the coefficient of

determination as revealed by R-square ( $R^2$ ) in between the firms was 20.67%. This indicates that 20.67% of variations observed in the dependent variable return on equity were explained by variations in the independent variable external financing and the control variables (asset structure and size). This is understandable given the level of observations in the panel data set. The Wald

Chi<sup>2</sup> which was  $12.88 > 0.05$  indicates that the F-test result of a the coefficient in the model is not different than zero. The random effect result which was less than zero reveals that the differences across units are uncorrelated with the regressors. For the control variable, the results indicates that asset structure of quoted manufacturing firms in Nigeria also had negative and significant ( $a = -0.343$ ,  $t = -3.41$ ,  $p\text{-value } 0.001 < 0.05$ ) impact on the return on equity while size of the firm had positive though positive and significant ( $a = 0.26$ ,  $t = 3.09$ ,  $p\text{-value } 0.002 < 0.05$ ) impact on return on equity.

## VIII. CONCLUSION

The preoccupation of the paper has been to investigate impact of Capital Structure, External Financing on the profitability of Nigerian manufacturing firms. This had been investigated through two perceptives:

1. The Impact of External Financing on return on equity and,
2. On earning per share.

These are two relationship of profitability indices.

The data analysed in this study not only show that return on Equity is negatively related to external financing and that external financing does not magnified earnings attributed to shares both in terms of book value measures or returns attributed to them

The finding in this paper contribute to the fact that shareholders of Nigeria firms do not get back some returns on their investments as revealed by result of the analysis that the impact of external financing had negative and non-significant impact on return on equity and earning per share. The implication as stated above is that wealth is not created. This has conform to earlier studies in Nigeria by various scholars, that Nigeria thrives only in one sector of oil economy. Other studies, had called for development of the Capital Goods Sector of Nigeria's manufacturing industry, which they stated that the absence will affect the transformation of its own saving to investment.

The analysis in this paper also found that assets of the firms are positively related to external financings. The implication is that as external financing is increasing, the assets also increased, but this increase does not reflect on the profitability of the firms. One reason may be eluded to the fact that these assets are purchased outside the country with its exhotbitant cost and by implication the cost of production becomes high and profitability is produced minimally.

In view of finding of this research, management must match the financing mix to the assets financed as closely as possible in term of both timing and cash flows as to achieve the overall objective of the firm, because value enhanced firm implies happy

stakeholders thereby enhancing earnings attributable to shareholders.

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