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Journal of Economic and Social Studies (JECOSS) aims to develop scientific knowledge in the areas that include, and are related to Economics, Business Administration, Public Administration, Political Studies, International Relations, Labor Economics and Industrial Relations, Econometry, Sociology and Psychology. As an international social sciences journal with interdisciplinary feature, it will set a ground to bring social science communities across disciplines identified above with a view for sharing information and debate. The journal publishes refereed articles and technical research notes that build on theory and contemporary scientific knowledge. Articles submitted to JECOSS will be peer-reviewed and expected to report previously unpublished scientific work. Submitted manuscripts should follow journal guidelines and should not be under consideration elsewhere.

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# Do Private Savings Offset Public Savings in Turkey?

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#### ABSTRACT

The issue of whether public savings offset private savings, and visa vice, has important implications for the effectiveness of fiscal policy. This study Savings, Offset examines long-run relationship between public and private savings rates using Coefficient, Ricardian annual Turkish data for the period 1975-2005. The result of Engle-Granger Equivalence, DOLS, cointegration test has shown that there is no long-run relationship between private and public savings ratios. However, once endogenously determined structural break is allowed, the test results confirm the existence of the cointegration relationship between private and public savings. Econometric estimation of the offset coefficients using both FMOLS and DOLS yields values of between -0.11 and -0.82. The results also indicate that the potency of fiscal policy significantly reduced with the liberalization of financial markets.

#### **KEYWORDS**

FMOLS.

#### **ARTICLE HISTORY**

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#### Introduction

The relationship between private and public savings has been central issue in both the theoretical and the empirical literature. The importance of the subject stems from the fact that the effectiveness of fiscal policy is closely related to the responsiveness of private saving to changes in fiscal stance. The relationship between lower public deficits and national savings, however, remains controversial both theoretically and empirically. Theoretically, while Keynes (1936) assumes no relationship between private and public savings, Friedman (1957) and Modigliani (1946) develop models showing full substitution between private and public savings. Barro (1974) also introduced the notion of perfect substitutability between private and public savings, which is called Ricardian Equivalence Proposition (REP).

Although there area number of opposing views in the theoretical literature, ultimately, it is an empirical issue to determine the extent to which private savings offset public savings. In the empirical literature, the relationship between private and public savings is investigated for different countries using different econometric methodologies. However, there is no consensus over the size offset coefficient (for a survey see Seater, 1993, Holmes 2006 and Ricciuti 2007). Studies on advanced economies have shown that about half of the change in public savings is offset by an opposite change in private saving (Masson et. al. (1998); Hemming et. al. (2002); Holmes (2006); Mandal and Payne (2007); Seater and Mariano (1985); Leiderman and Razin (1988); Makin and Narayan (2009); De Castro andFernandez (2009)). Although empirical studies are limited in number, offset coefficients were found to be higher for developing countries than for developed countries (Loayza et. al. (2000); Lopez et. al. (2000); De Mello et. al.(2004); Edwards (1996); Masson et. al. 1998; Bulir and Swiston (2009)).

This study provides evidence on the validity of the REP by applying powerful econometric techniques of DOLS and FMOLS to time series data of a developing country, Turkey. This paper is organized as follows. Following section sets out the econometric methodology and the data employed in this study. Then, we presented the findings of the study in the empirical section. Last section concludes.

#### Methodology and Data

Empirical studies on testing the REP estimate the following model:

$$PSR_t = \alpha + \beta GSR_t + e_t \tag{1}$$

where refers to private sector savings as a proportion of GDP, is public sector savings as a ratio to GDP; is the long-run public-private offset (substitution) coefficient is the intercept term and represents usual error term. takes value between 0 (no offset) and -1 (full offset). If , then a decrease in public sector savings is fully offset by an increase in private sector savings.

The data employed in our empirical analysis is an annual private and public sector as a percentage of GDP obtained from State Planning Organization (SPO) publications for the years 1975 and 2005. Before estimating the long-run offset function given in equation (1), we first need to investigate the time series properties of the private and public sector saving ratios. Results obtained from unit root tests which are performed to determine whether savings variables have a unit root are presented in Table 1a and Table 1b. While Table 1a presents the results obtained from the ADF, DF-GSL, PP, KPSS and ERS unit root tests, Table 1b shows the Ng-Perron unit root test results. Examination of the Tables show that the null hypothesis of unit root could not be rejected for both private and public sector savings ratios.

Table 1.a. Unit Root Test Results

		PSR	GSR		
	Constant	Constant and Trend	Constant	Constant and Trend	
ADF	-1.432876	-1.133958	-1.473065	-2.322051	
DF-GLS	-1.367547	-1.595668	-1.384922	-1.798766	
РР	-1.454917	-1.253357	-1.479741	-1.480789	
KPSS	0.538798	0.110454	9.029962	0.380299	
ERS	8.002194	13.83224	8.084297	12.96383	

*Note:* ADF, DF-GSL, PP, KPSS and ERS stand for Augmented Dickey-Fuller (1979), Phillips Perron (1988), Elliot, Rothenberg, and Stock (1996), Kwiatkowski, Phillips, Schmidt and Shin (1992), Elliot, Rothenberg, and Stock point optimal (ERS, 1996) unit root tests.

#### Table 1.b. Ng-Perron Unit Root test Results

		MZa	MZt	MSB	MPT
PSR		-3.24375	-1.25975	0.38836	7.53622
GSR		-3.23349	-1.27022	0.39283	7.57531
Asymptotic critical values*:					
	1%	-13.8000	-2.58000	0.17400	1.78000
	5%	-8.10000	-1.98000	0.23300	3.17000
	10%	-5.70000	-1.62000	0.27500	4.45000

*Note:*The number of lags used in Ng-Perron (2001) unit root test is determined by Schwarz Information Criteria(SIC) and turned out to be zero for all specifications.

Having established that private and public savings ratios are I(1) variables, we need to test for cointegration between private and public savings to avoid spurious regression. To determine whether there is long-run relationship among these variables, the Engle-Granger (1987) methodology is employed. Testing for cointegration within this methodology involves extracting the residuals from equation (1) and testing for unit root in residuals. The Engle-Granger bivariate cointegration equation and the ADF tests applied to residuals are reported in Table 2. The optimal lag determined by using Schwarz and Akaike information criteria turned out to be zero. The cointegration test statistic is -2.086 with a probability value of 0.251 implying non-rejection of the null of unit root in residuals. Hence, there appears to there is no long-run relationship between private and public sectors savings ratios.

Table2. Engle- Granger Cointegration Test

Dependent Variable	Constant	GSR
DCD	20.157	-1.009
FSIN	(0.531)*	(0.101)*
ADF test statistics (probability):	-2.086 (0.251)	
	1% level	-3.671
Test Critical values:	5% level	-2.964
	10% level	-2.621

Note: The values in parenthesis are standard errors. \* indicate significant at 1% level.

Furthermore, we employed Johansen multivariate cointegration tests to explore if there is a long run relationship between private and public savings. The number of lags used in the underlying the vector auto regression (VAR) model were determined as one for the model according to both the Schwarz Bayesian Criterion (SBC) and Akaike's Information Criterion (AIC). The corresponding values of SBC and AIC criterion are 9.160 and 8.867 respectively.

The cointegration test results obtained from the Johansen and Juselius (1990) method for the model (1) is presented in Table 3. The examination of the table indicates that the null hypothesis of no cointegration cannot be rejected by both the maximum eigenvalue and the trace statistic for the model implying that there is no long-run relationship between private and public savings.

#### Table 3. Johansen-Juselius Maximum Likelihood Co integration Tests

Trace Te	st			Maximum Ei	genvalue Test		
Null	Alternative	Statistic	Critical Values	Null	Alternative	Statistic	Critical Values
r = 0	r ≥ 1	11.946	15.494	r = 0	r = 1	10.065	14.264
r ≤ 1	r ≥ 2	1.881	3.841	r ≤ 1	r = 2	1.8810	3.8415

Notes: Asterisks (\*) denotes statistical significance at 5%. R stands for the number of cointegrating vectors.

However, the cointegration tests have a low power in the presence of a structural break (Gregory and Hansen, 1996). For this reason, we applied Gregory-Hansen cointegration procedure to test whether there is long-run relationship among private and public savings. Specifically, Gregory and Hansen (1996) provide the following three structural break alternatives given by equations (2a-2c):

$$PSR_t = \alpha_0 + \alpha_1 D + \beta GSR_t + e_t \tag{2a}$$

$$PSR_t = \alpha_0 + \alpha_1 D + \delta t + \beta GSR_t + e_t$$
(2b)

$$PSR_t = \alpha_0 + \alpha_1 D + \beta GSR_t + \beta_1 (D * GSR) + e_t$$
(2c)

where D represents a dummy variable equal to 0 if is less than or equal to unknown timing of change , otherwise it is equal to one; is time trend; other variables are defined as before. The first co integration regression (2a) is allowed to have a level break, the second model includes level shift and time trend and third model includes regime shift variable.

(0)

Given that the structural break point is unknown, Gregory-Hansen procedure involves computing the cointegration test statistics for each possible break and taking the minimum test statistics (ADF test) across all possible break points. That is, the break point is unknown and determined by finding the minimum value for the ADF statistic. The Akaike Information criterion (AIC) is used to determine the number of lags of the change in the residual used in computing the ADF statistic and turned out to be zero for all three models. The results of the Gregory-Hansen Cointegration procedure for all specifications indicate that the null of no cointegration is rejected with an endogenous break year of 1989. The ADF statistics for equations (2a-2c) are -5.082, -5.34836 and -5.15361 respectively and they are statistically significant at 5 percent level.

#### **Empirical Results**

Having found evidence of co integration and having established that private and public saving are I(1), the equations (2a-2c) are estimated using the Dynamic OLS (DOLS) proposed by Stock and Watson (1993) and the FMOLS proposed by Phillips and Hansen (1990). In the estimation of equations (2a-2c) with the Dynamic OLS (DOLS), we used two lead and lag terms. The number of lead and lag-terms are determined by using AIC and SBC criterion. The results obtained from FMOLS and DOLS estimators are presented in Tables 4a-4c. Examination of the Tables indicates that while the FMOLS coefficients of offset (betas) ranges between -0.82 and -0.46, the DOLS coefficients of betas ranges from -0.74 to -0.11 yielding a partial offset. For models (2a) and (2b), coefficient on government savings is statistically significant at 1% level. However, the offset coefficient is insignificant in the model (2c). The long-run offset coefficient estimated by FMOLS (DOLS) is -0.458 (-0.11) but they are both statistically insignificant. However, there was statistically significant (at 5% level) change in the slope coefficient, , after 1989 for DOLS estimates. Thus allowing for the slope change in the regime shift specification in the DOLS case, the long-run coefficient is -0.72 (. The structural break dummy, D, is significant across alternative estimates implying the presence of structural break in the data. Taken together, the results show that a structural break did occur in the long-run relationship between private and public saving in 1989.

#### Table 4.a. FMOLS and DOLS Estimates for Level Shift Model, 1975-2005

	FMOLS	DOLS
Constant	16.129	15.734
Constant	(1.002)*	(0.682)*
CCD	-0.709	-0.741
GSR	(0.129)*	(0.0967)*
D	5.112	5.377
D	(1.268)*	(0.891)*

*Note:* \*, \*\*, \*\*\* indicate significance at 1%, 5% and 10% level of significance respectively. The values in parenthesis are standard errors.

#### Table 4.b. FMOLS and DOLS Estimates for Level Shift with trend Model, 1975-2005

	FMOLS	DOLS
Constant	18.263	13.892
Constant	(1.310)*	(1.393)*
CSP	-0.819	-0.577
dSh	(0.124)*	(0.148)*
D	7.320	4.693
d	(1.503)*	(1.049)*
TREND	-0.193	0.137
IREIND	(0.084)**	(0.088)

*Note:*Seethenote in Table3.a.

#### Table 4.c. FMOLS and DOLS Estimated for Regime Shift Model, 1975-2005

	FMOLS	DOLS
Constant	14.571	11.685
	(2.977)*	(2.263)*
CSP	-0.458	-0.109
dSk	(0.462)	(0.349)
D	6.627	9.355
U	(3.032)**	(2.318)*
DCCP	-0.268	-0.613
DGSK	(0.483)	(0.322)**

*Note:*Seethenote in Table3a.

#### **Concluding Comments**

This study examines the long-run relationship between private and public sector saving ratios using FMOLS and DOLS methodologies. Empirical findings of this study can be summarized as follows: First, there is no long-run relationship between private and public savings unless endogenous structural break in the cointegration relationship is allowed in Turkish case. Secondly, the extent of offset coefficients ranges from -0.82 to -0.11 supporting weak form of Ricardian equivalence. Statistically significant change in the slope coefficient in DOLS case also shows that the substitution (offset) between private and public savings are stronger after 1989. This point is particularly worth mentioning because financial repression in Turkish economy was fully removed at this date. Thirdly, the results of the paper suggest that the effectiveness of fiscal policy implementations by the government has decreased significantly after achieving financial liberalization in 1989. The statistically significant and relatively large coefficient () on regime shift variable can be taken as an evidence for this argument.

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## Store Personality: Perceptions Towards Consumer Electronics Chain Stores in Turkey A Case of University Students

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ABSTRACT

#### The purpose of this study is to identify, develop and compare the determinants of store personality of the most preferred consumer electronics chain stores, as perceived by young consumers in Turkey. A questionnaire survey including a 22-item store personality scale was conducted Confirmatory Factor Analysis, among 855 students using a convenience sampling method. Exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) was performed. Findings suggest that greater accuracy of information is needed in the purchasing decision related to high involvement products such as consumer electronics. Also it was found that younger consumers prefer reliable stores that give accurate information, value for money, and provides price-quality fit. This study addresses the neglected area of store personality development and validation for consumer electronics relates through an understanding of young consumers perceptions towards store personality determinants.

**JEL Codes:** M31, M39

**KEYWORDS** 

Store personality, Consumer Electronic Chain Stores, Turkey

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#### Introduction

In recent years, the growing importance of technology in our daily life has increased enthusiasm for consumer electronics consumption. In particular, young consumers, who are leading the adoption of new technologies, have become more ambitious in their purchases (Accenture, 2012, p. 6). In Turkey, consumer electronics is one of the fastest growing markets, with sales of 3,648 million TL in 2011 (GfK, 2011), with several new entrants establishing themselves the market. However, many of the products and brands sold in consumer electronics retail stores are perceived as being very similar (Yozgat and Deniz, 2008, p. 121). Pursuing sustainable competitive advantage in the current market environment necessitates some degree of differentiation in the products offered by consumer electronics retailers. Therefore, as individual customers tend to attribute humanized characteristics to brands or products, building a particular store personality with appropriate characteristics (Blankson and Crawford, 2012, pp. 311-315) can be an effective way to differentiate a particular store from competitors, and position itself through these characteristics, which include product availability, service quality, value for money, and store atmosphere.

The concept of "brand as a person", or in other words "brand personality", as the set of human characteristics associated with a brand (Aaker, 1997, p. 347) is an important concern for consumers, and in turn, for marketers and academicians (Grohmann, 2003, p. 224; Aaker and Fournier, 1995, p. 392; Wang and Yang, 2008, p. 460; Ambroise, et al., 2005, p. 32). Customers interaction with brands is often similar to their interaction with other people, especially when the brands are attached to such meaningful objects as clothes or cars (Aaker, 1996, p. 142). As individuals tend to associate the brand with their life situations and roles (Ligas and Cotte, 1999, p. 611), interaction with brands as if they were people necessitates defining personality traits that affect the relationship between attributes of people and their behavior in various situations (Hurley, 1998, p. 116), such as purchasing. Furthermore, in order to be useful in a social context, a brand's meaning should be formed based on three components: its physical make up, functional characteristics, and characterizationi.e., personality (Ligas and Cotte, 1999, p. 612). As human or brand personalities are related in the context of retail stores (Brengman and Willems, 2008, p. 27), consumers are able to identify a particular personality related to a store based on both its tangible (design, environment, etc.) and intangible (attitude of sales personnel, service quality, etc.) components. Despite approximate similarity in price, service, merchandising and marketing activities, some stores are overwhelmingly preferred to others (Martineau, 1958, p. 47). Thus, it could be concluded that there should be other factors that

directly or indirectly affect consumers, and in turn, their preferences. Store personality is considered to be one factor responsible for differentiating and positioning a store, because when a store is humanized, it relates to self-meaning that has congruent personalities to oneself (Chan, *et al.*, 2003, p. 302), this being consistent with the "self-congruity" theory (Sirgy and Samli, 1985; Sirgy, *et al.*, 2000).

As Turkish consumer electronics chain stores are all highly competitive and implement similar marketing strategies, some degree of differentiation is necessary within their positioning strategies, especially in regard to younger consumers. In this respect, the purpose of this study is to identify and compare the determinants of store personality of the most preferred consumer electronics chain stores, as perceived by young consumers in Turkey. Additionally, it aims to explore specific store personality determinants, and also to develop a scale in a consumer electronics chain store context. Accordingly, exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) were applied to the most preferred consumer electronics chain stores, in order to validate the scale. The conceptual framework for the empirical research was based on store personality in retailing services. In the first section of the study, the concept of store personality is discussed. Following this, the research design and the results of the study are presented. The study is concluded by outlining the implications and recommendations for the practitioners, the limitations of the study, and opportunities for further research.

Store personality has been investigated by relatively few researchers including Martineau (1958), d'Astous and Levesque (2003), Brengman and Willems (2008). As the scales developed in these studies are too general, and based on a specific context, they cannot be appropriately applied to consumer electronics chain stores. Accordingly, the studies of these authors are utilized to develop a new scale to increase understanding of the perceptions of university students' towards consumer electronics chain stores. The findings of the present study have the potential to contribute to store personality literature by developing and validating a store personality scale for the use of consumer electronics retailers to position themselves in young consumer markets.

#### Literature Review

The concept of store personality was introduced by Martineau (1958, p. 47), who defined it as "the way in which the store is defined in the shopper's mind, partly

by its functional qualities and partly by an aura of psychological attributes". Store personality is commonly related to store image, but there are important differences in meaning. Although store image is associated with all the dimensions related to the store, store personality is restricted to those dimensions that correspond to human traits (d'Astous and Levesque, 2003, pp. 455-456). As the concept of human and brand personality are both directly transferable within the context of retail stores (Brengman and Willems, 2008, p. 27; Khan, 2010, pp. 9-10) these traits are relevant to the concept of "brand personality".

Aaker (1997) proposed the commonly accepted brand personality dimensions (sincerity, excitement, competence, sophistication, and ruggedness), and defined the concept, mainly by focusing on its positive attributes. The brand personality concept can help brand strategists enrich their understanding of people's perceptions and attitudes toward the brand. It contributes to a differentiated brand identity, guiding the communication effort and creating brand equity (Aaker, 1996, p. 150). Customers often interact with brands in the same way they interact with other people (Aaker, 1996, p. 142). When consumers view it as having human characteristics, the brand is said to have a personality. Examples of brands found to have strong personalities include Harley Davidson (ruggedness) and Nike (excitement). Madrigal and Boush (2008) stated that trait inferences can also be made about store personality from the combination of marketing mix elements in which the retailers engage. For the stores themselves, other attributes, such as ambience, design and social components are also of concern (d'Astous and Levesque, 2003, p. 457) as these could directly affect the perception of store personality. Other aspects that affect store personality are store name, store environment, service quality, store personnel, merchandise quality, and carried brand names (Brengman and Willems, 2009, p. 347).

A number of studies on store personality were conducted by Martineau (1958), who proposed the main influencing factors could be classified into three main areas: layout and architecture, symbols and colors, and advertising and sales personnel. However, d'Astous and Levesque (2003) stressed that the dimensions used by Martineau (1958) were related with image rather than personality, and they developed a 5 dimensional scale, consisting of "sophistication", "enthusiasm", "genuineness", "solidity" and "pleasantness", which included a total of 34 sub items. In the same study, they also prepared a reduced scale with the highest factor loadings: "enthusiasm" (welcomeness, enthusiasm, liveliness and dynamism); "sophistication" (chicness, being high class, elegance and style); "genuineness" (honesty, sincerity, reliability and honesty/truth); "solidity" (hardiness, solidity, reputation and prosperity) and "unpleasantness"

(annoyance, irritation, loudness and superficiality). These dimensions were those which had been most commonly accepted and used in previous studies (Brengman and Willems, 2009). In Brengman and Willems' (2008) study, in which a fashion store was evaluated in the terms of store personality, 5 major classifications were proposed. These were "store atmosphere" related with design, ambience and social factors; "merchandise" related with price, quality, style and assortment; "retailer's reputation" related with "word-of-mouth", advertising, communication and social responsibility; "service" related with direct interactivity along with "format and location".

In a store environment, factors as such as attachment, experience and structure are also important. These formations are evaluated through defining mechanisms, triggering memories linked to affect, which is either positive (Orth, Limon and Rose, 2010, p. 1207) or negative. Thus consumers develop a perception about a particular store that will affect shopping decisions. For this reasons, the design and structure of the store, and the qualities of the sales personnel represent important indicators of perceived store personality. Where the environment is formal, expressive, symbolic and has a professionally planned setting that interacts with the product, (Fiore and Ogle, 2000, p. 34) it influences the customer's perception of store personality (Harrell and Hurt, 1976). As consumers repeatedly see, touch, hear and smell the commodities, as well as experience the environment, they derive value from formal, expressive and symbolic qualities, and this process influences their beliefs about the store (Fiore and Ogle, 2000, p. 34; Darden and Babin, 1994, p. 101). Subsequently, they associate the brand with their lifestyles and roles, thus there is a strong connection with their view of "self" (Ligas and Cotte, 1999, p. 613). Thus, they use brand personality to define their sense of "self" and tend to seek brands or stores with congruent personalities (Chan, et al., 2003, p. 304), consistent with the "selfcongruity" theory (Sirgy and Samli, 1985; Sirgy, et al., 2000). However, the way a store is perceived depends on the personality of each customer (Wesley, et al., 2006, pp. 167-168). The impressions in consumers' minds will result in particular store preferences (Martineau, 1958:55; Brengman and Willems, 2009, p. 352). A good impression can be achieved by building a store personality and finding a suitable "location" in the minds of a group of consumers or a market segment (Keller, 2003, p. 119), a strategy known as "positioning".

Most importantly, brands' objective personality traits do not exist independent of consumer perception (Zentes, Morschett and Schramm-Klein, 2008, p. 169). The process by which consumers use a product category and attribute information from memory has implications for selecting the appropriate positioning strategy to achieve

brand association (Punja and Moon, 2002, p. 276). The brand, with its symbolic and human attributes, customizes its marketing mix according to store personality. However the personality that managers aim to implement may be different to that perceived by consumers. If there is a major gap between managers' implementations and consumers' perceptions of these, then it will be impossible for managers to communicate with consumers in a satisfactory manner.

As store personality is directly related with "the perceptions of consumers", it becomes important to evaluate store personality in the context of store positioning. Perceptions are mostly formed according to the factors representing the store's "intangible assets", which, according to Hooley, *et al.* (2001), are most difficult for competitors to imitate. Therefore, if a firm can succeed in positioning itself through personality characteristics, it will make an important contribution to its performance in terms of competition and long-term survival.

While, the literature contains a number of studies on the determinants of brand personality, there is a need for further studies on store personality and its determinants, as these have received less attention. In this field, Martineau (1958) mostly focused on store image attributes to define store personality, d'Astous and Levesque (2003) utilized Aaker's (1997) brand personality dimensions to develop a general store personality scale; however, this does not fit all retail stores. One example of the development of a new scale is Brengman and Willems' (2008), which used qualitative methods to develop a scale for fashion stores based on d'Astous and Levesque (2003). In this study, we draw on this previous research (Martineau, 1958; d'Astous and Levesque, 2003; Brengman and Willems', 2008) to understand the perceptions of young consumers towards the determinants of store personality. Using survey methodology, a new store personality scale is developed for consumer electronics chain stores.

#### **Field Study**

According to the GfK Retail and Technology 2011 Report, consumer electronics is one of the fastest growing sub-sectors in Turkey, with sales of 3,648 million TL. The consumer electronics sub-sector includes of color televisions, audio appliances, video players, cash registers, audio-video cassettes, television satellite receivers and antennas, electronic scales and electronic calculators. There are various domestic and foreign actors in the Turkish market, notably Teknosa, Vatan Computer, Bimeks,

Darty, MediaMarket, BestBuy, Electroworld and Gold. These highly competitive market players need to be differentiated through their positioning strategies. A consumer electronics product is not only a tool with which the user performs a task, but also a decorative item for the home, or means to express one's personality and lifestyle (Han, *et al.*, 2001, p. 145). For this reason, the purchase of electronics products entails high involvement, in which consumers seek specific qualities in the products themselves. This very personalized approach makes the consumer electronics sector particularly suitable for store personality research.

In this competitive environment, building store personality can be a significant factor in positioning a store. Within this context, the aim of this study is to explore and compare the determinants of store personality, as perceived by young consumers, of the most preferred consumer electronics chain stores in the Turkish market. In March 2011 a questionnaire survey was conducted among 855 students from the Faculty of Economics and Administrative Sciences, Ege University in Izmir, using a convenience sampling method. The questionnaires, which took 10-15 minutes to complete, were distributed in the classes and campus area by three research assistants, who had been informed of the content. This sample was chosen due to the fact that young consumers are more familiar with consumer electronics and often influence family purchasing decisions (Hafstrom, *et al.*, 1992). In addition, the enthusiasm of young people for consumer electronics makes them a potentially highly profitable segment of the market (Accenture, 2012, p. 15).

The questionnaire consisted of three sections. The respondents were asked to state their preferred consumer electronics store in the first section. The second section gave 22 statements relating to the determinants of store personality for the consumer electronics context. These statements, generated by the author, were based on the following: Martineau's (1958) store personality determinants (architecture, colour schemes, advertising, salespeople and others), d'Astous and Levesque's (2003) determinants for store personality dimensions; and Brengman and Willems, (2008, 2009)'s five major fashion store personality determinants (store atmosphere, merchandise, reputation, service and format). Brengman and Willems, (2009) determined four categories containing different items as follows : (i) "store atmosphere": interior design, music, layout, window display (Berman and Evans, 2010, pp. 508-509); (ii) "merchandise": price, quality, product range (Berry, 1969); (iii) "service": sales people's attitudes (O'Cass, A. and Grace, D., 2008); (iv) "format": premium branded products, highincome level target (Brengman and Willems, 2009). A 5-point 'Likert' scale ranging from "strongly disagree (1)" to "strongly agree (5)" was utilized. Finally, in the last section, there were some demographic questions related to the respondent's gender, age, income level. The questionnaire was originally prepared in Turkish, and the statements were translated into English for the tables.

The findings of the study are presented in two parts. In the first part, EFA was conducted to the determinants (Martineau, 1958; d'Astous and Levesque, 2003; Brengman and Willems, 2008) of store personality in order to identify specific factors of store personality and obtain important insights about the data structure. In the second part of the study, ANOVA is performed to compare the perceptions of respondents to the specific determinants of store personality. Following this, first and second-order CFA was performed for each most preferred store in order to test the validity of scale, that is to assess its fit to the proposed theoretical basis.

#### Findings

The sample comprised 53.1 % female and 46.9 % male students. TeknoSa (52.4 %), MediaMarkt (27.9 %) and Vatan Computer (21.1 %) were chosen as the most preferred consumer electronics chain stores, comprising 87.9 % of the sample. The profile of the sample appears in Table 1.

Table 1. Profile of the sample

Variables	Ν	Valid Percent	Variables	N	Valid Percent
Sex			Monthly Income		
Female	379	53.1	650-1379 TL	236	34.6
Male	335	46.9	1380-2109 TL	174	25.5
Missing	38		2210-2839 TL	113	16.5
			2840-3569 TL	49	7.2
			3570-4299 TL	44	6.4
			4300-5029 TL	18	2.6
			5030-5759 TL	12	1.8
			5760-6489 TL	9	1.3
			6490 TL +	28	4.1
			Missing	69	
Total	752	100	Total	752	100
Mostly Prefer	red Elec	ctronic Store	Age		
TeknoSA	384	51.0	18-24	607	80.7
Mediamarkt	210	27.9	25-31	145	19.3
Vatan	158	21.1			
Total	752	100	Total	752	100

In order to establish the evaluations related to the statements determining store personality, one sample t-test was conducted. As shown Table 2, the findings of one sample t-test about the respondents' perceptions of store personality determinants revealed that young respondents (a) can easily find the products they are looking for in these stores (t=31.622 df:739 p=0.000), (b) visit these stores for its premium branded products (t=23.362 df:736 p=0.000), (c) get accurate information (t=28.401 df:747 p=0.000) and (d) receive value for their money (t=20.535 df:743 p=0.000).

Table 2. One Sample T-Test of the Respondents' Evaluations

		Sta.	t	df	Sig
Statements	Mean	dev.	·	ui	516.
I visit this store for the premium branded products.	3.88	0.991	25.822	854	0.000
I think stores like this sell high-priced products.	3.09	1.129	2.389	854	0.017
I appreciate the interior design of this store.	3.60	0.982	17.865	854	0.000
I think this store serves high-income customers.	2.81	1.124	-4.976	854	0.000
I appreciate the window display of this store.	3.32	1.029	8.852	854	0.000
The music played in this store enables me to take pleasure from	า 3.31	1.072	4.007	854	0.000
shopping					
I appreciate the young and dynamic sales staff of this store	3.15	1.029	15.279	854	0.000
I find more suitable consumer electronics products for young	<sup>8</sup> 3.54	0.945	19.963	854	0.000
people in this store compared to other stores					
Only the latest technology products are sold in this store	3.65	1.080	5.674	854	0.000
The low turnover of salespeople in this store gives me confidence	. 3.21	1.069	5.628	854	0.000
The salespeople in this store are very knowledgeable.	3.56	0.961	16.980	854	0.000
I can easily find what I am looking for in this store.	3.96	0.820	34.351	854	0.000
This store determines a price which is appropriate for the quality	y 3.71	0.899	22.905	854	0.000
of the product.					
Information given related to the products is correct in this store.	3.86	0.815	30.762	854	0.000
I think the advertisements of this store give accurate information	. 3.66	0.900	21.403	854	0.000
I think this store always gives me value for money.	3.70	0.895	23.006	854	0.000
I do not think that this store makes false claims to increase sales.	* 2.36	0.982	-18.943	841	0.000
I do not like the aggressive attitude of the salespeople towards	s 3.52	1,130	13,310	836	0.000
customers.*	0101	11100	101010	000	0.000
Whenever I want to buy a product from this store, they tell me	3.69	1.030	19,489	842	0.000
that the product is out of stock *	0100	1.000	101100	0.1	0.000
The confusing layout of this store makes it difficult to find what am looking for.*	l 3.74	1.009	21.286	838	0.000
This store's interior colour irritates me. *	3.77	0.996	22.269	835	0.000
The constant crowding in this store irritates me. *	3.35	1.108	9.307	846	0.000

Test value is 3 (neither agrees nor disagrees) \*recoded

An exploratory factor analyses was perfomed on the total sample in order to identify the specific determinants of the store personality with Varimax rotation. The Kaiser-Meyer-Olkin (KMO) test and Bartlett's test of sphericity were computed to assess the appropriateness of factor analyses to the data. The Kaiser-Meyer-Olkin Measure (KMO) of Sampling Adequacy (0.834) also showed that sample adequacy was satisfactory and the Bartlett's test of sphericity was significant (p<0.000). The factor analysis of the 22 item scale yielded a 'three principal components' solution. Each of these three factors had an eigen value greater than one. The statements with factor loadings lower than 0.50 were removed from the study. During the factor analysis, eight variables that were unrelated to any factor were excluded, and a total of three factors were extracted from the remaining 13 items. The analysis produced three store personality factors, and explained 56.3% of the variance. Also, Cronbach's alpha coefficients were calculated in order to check the internal consistency and reliability of each factor. Factor loadings ranged from 0.63 to 0.81 and alpha coefficients ranged from 0.67 to 0.80, indicating a high internal consistency and reliability for the factors. The factors were declared as "Pleasantness", "Reliability" and "Welcomeness" in accordance with their respective factor loadings (Table 3).

#### Table 3. Results of Exploratory Factor Analysis Recoded

Common Factors	Statements	Factor Loading	Factor Interpretation (Cumulative % of variance explained)	Cronbach Alpha
	The confusing layout of this store makes it difficult to find what I am looking for.*	0.799		
	This store's interior colour irritates me. *	0.791		0.80
Pleasantness	Whenever I want to buy a product from this store, they tell me that the product is out of stock.*	0.762	21.775	
	The constant crowding in this store irritates me.*	0.694		
	I do not like the aggressive attitude of the sales- people towards customers.*	0.640		
	Information given related to the products is accurate in this store.	0.751		
	I think this store always gives me value for money.	0.735		0.77
Reliability	I think the advertisements of this store give accurate information.	0.727	41.989	
	The salespeople in this store are very knowledge- able.	0.670		
	This store determines a price which is appropriate for the quality of the product.	0.626		
	I appreciate the interior design of this store.	0.812		
Walcomonocc	I appreciate the window display of this store.	0.752	E6 022	0.67
weicomeness	The music played in this store enables me to take pleasure from shopping.	0.704	50.032	0.67
КМО		0.834		
Bartlett Test		2940.500	); (df: 78; p<0.05)	

In order to compare the respondents' evaluations of "Pleasantness", "Reliability" and "Welcomness" factors, and explore the differences between the most preferred stores, both a sample t-test and ANOVA were conducted. H1 is generated as follows:

 $H1_{a/b/c/d/e/f/g/h/i/k/l/m/n}$ : All three stores are statistically different according to (a) layout, (b) interior colour, (c) product availability, (d) crowdedness, (e) attitude of salespeople, (f)accuracy of product information, (g) value for money, (h) accuracy of information in ads, (i) knowledge of salespeople, (k) price-quality fit, (l) interior design, (m) window display and (n) in store music.

Findings of the sample t-tests (Table 4) revealed that the majority of the mean values for each item were very close among the three stores. Considering the findings, it can be proposed that, although these three are the most preferred ones, they were able to differentiate themselves to a limited extent in relation to store personality determinants. It can be said that, although young people perceive these stores as being similar in all services, Vatan Computer and Teknosa were considered to give better value for money (F=7.847 df: 2/749 p=0.000) compared with MediaMarkt. Vatan Computer sets more reasonable prices according to the quality of their products (F=7.335 df: 2/749 p=0.001) than the other two. Sales personnel in MediaMarkt are perceived to have more knowledge (F=4.662 df: 2/749 p=0.010) than those in Teknosa. Also, the respondents who preferred MediaMarkt and Teknosa reported that the music in these stores gave a more pleasurable shopping experience (F=6.601 df:2/749 p=0.001) than was stated by those who preferred Vatan Computer. Considering these findings, H1<sub>g</sub>; H1<sub>k</sub>; H1<sub>i</sub> and H1<sub>n</sub> are supported (p<0.05).

		Teknosa			Media	Jarkt		Vatan		
ommon Factors	Statements	Mean	t**	df	Mean	t**	df	Mean	ť**	df
	The confusing layout of this store makes it difficult to find what I am looking for.*	3.70	13.812	386	3.71	9.873	206	3.78	10.093	142
	This store's interior color irritates me. *	3.74	14.750	385	3.74	10.548	200	3.77	9.972	145
easantness	Whenever I want to buy a product from this store, they tell me that the product is out of stock.*	3.69	14.161	388	3.61	7.932	205	3.69	8.004	144
	The constant crowding in this store irritates me.*	3.30	5.590	390	3.25	3.038	206	3.49	5.283	145
	I do not like the aggressive attitude of the salespeople to- wards customers.*	3.41	7.368	987	3.62	8.107	204	3.56	5.600	144
	Information given related to the products is accurate in this store.	3.83	22.667	393	3.81	13.311	209	3.93	12.473	147
	I think this store always gives me value for money.	3.56	12.901	393	3.80	12.442	209	3.84	11.135	147
eliability	I think the advertisements of this store give accurate infor- mation.	3.67	16.056	393	3.65	9.364	209	3.62	7.941	147
	The salespeople in this store are very knowledgeable.	3.45	9.607	393	3.68	11.022	209	3.63	7.233	147
	This store determines a price which is appropriate for the quality of the product.	3.56	12.811	393	3.77	11.947	209	3.86	10.594	147
	I appreciate the interior design of this store.	3.63	13.560	393	3.54	7.619	209	3.54	6.314	147
alcomeness	I appreciate the window display of this store.	3.35	7.489	393	3.37	5.150	209	3.14	4.369	147
	The music played in this store enables me to take pleasure from shopping.	3.12	2.280	393	3.29	3.909	209	2.87	3.422	147
Test value is 3 (nei *recoded **p<0.05	ther agrees nor disagrees)									

Table 4. Comparison of One Sample T-Test of Three Stores

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EFA is essential in determining the underlying constructs for a set of measured variables. In order to test how well the measured variables represent the number of constructs (Brown, 2006), CFA was conducted with Maximum Likelihood Estimation in LISREL 8.80 (Jöreskog and Sörbom, 1997). CFA verifies the factor structure of a set of observed variables and statistically tests the validity and reliability of a hypothesized factor model (Suhr, 2006, p. 1). The hypotheses tested are as follows:

H2: The correlated (first-order) store personality factors explain an important proportion of the variance in the data.

H3: The set of store personality determinants comprises the latent variable, overall store personality.

First-order CFA was performed to examine the construct more closely and establish construct validity for each of the most preferred consumer electronics chain stores. The estimation of the first-order CFA model revealed that the data defined three factors with regression coefficients varying among the three stores. All the coefficients were significant at the 5 % level (Table 5). Therefore, the hypothesis H2 was supported. Vatan Computer store had the highest correlations between "pleasantness and reliability" (r=0.68), "reliability and welcomeness" (r=0.74), "pleasantness and welcomeness" (r=0.52) respectively. In order to obtain as much understanding of the data as possible, second-order factor analysis was performed (McClain, 1996, p. 131; Correia, *et al.*, 2008, p. 167). In comparison to first-order models with correlated factors, second-order factor models can provide a more interpretable model (Chen, et. al., 2005, p. 472).

Second-order CFA was conducted on the three-dimensional model of perceived store personality and compared each store independently, with the same items. Figure 1 presents the hierarchical construct of perceived store personality, consisting of several correlated first-order factors and a single second-order factor. In this model, the latent variables were "perceived store personality", "pleasantness", "reliability", "welcomeness", and the observed variables are store personality determinants. "Pleasantness" and "reliability" were represented by five items each, and "welcomeness" by three items.



Figure 1. Second-Order Confirmatory Factor Analysis of Perceived Store Personality

The standardized regression coefficients of the models and associated t-values for the 13 items are shown in Table 5. The output revealed that every standardized regression coefficient and the associated t-values are significant ( $p \le 0.05$ ). The resulting fit indices (GFI, CFI, AGFI, RMSEA,  $\chi^2$  /df) for all three store personality models displays satisfactory measure fit, which supported the construct validity of the measures. In order to assess the convergent validity of "pleasantness", "reliability" and "welcomeness" constructs, construct reliability was computed. Construct reliability values ranged from 0.617 to 0.893, which shows an acceptable convergent validity. Discriminant validity is computed by latent variable correlation matrix (Table 6). As seen from the Table 6, although some of the AVE (Average Variance Exracted) values are at moderate level (AVE<0.5) (Paswan, 2009), the square root values of AVE for all three stores are larger than the correlations, which demonstrates an acceptable discriminant validity.

		TEKNOSA (N=3	84)	MEI	JIAMARKT (N=	=210)		VATAN (N=158)	
Dranlintiva Daramatar Ectimatas		Standardized			Standardized			Standardized	
	t-value	Regression Coefficients	R2	t-value	Regression Coefficients	R2	t-value	Regression Coefficients	R2
PERCEIVED STORE PERSONALITY → PLEASANTNESS	2.77*	0.37	0.13	5.19*	0.66	0.44	5.53*	0.69	0.48
PERCEIVED STORE PERSONALITY → RELIABILITY	3.22*	0.83	0.68	4.44*	0.86	0.74	10.04*	0.98	0.97
PERCEIVED STORE PERSONALITY → WELCOMENESS	2.64*	0.50	0.25	4.88*	0.50	0.25	8.22*	0.82	0.56
PLEASANTNESS →LAYOUT	7.60*	0.76	0.58	7.73*	0.77	0.60	6.33*	0.82	0.67
PLEASANTNESS →INTERIOR COLOR	7.49*	0.74	0.55	7.58 *	0.74	0.55	6.35*	0.83	0.69
PLEASANTNESS →PRODUCT AVAILABALITY	7.34*	0.74	0.51	6.59*	0.60	0.36	5.52*	0.58	0.34
PLEASANTNESS →CROWDEDNESS	6.09*	0.54	0:30	5.57*	0.48	0.23	4.77*	0.45	0.20
PLEASANTNESS →ATTITUDE OF SALESPEOPLE		0.50	0.36		0.61	0.37		0.46	0.21
RELIABILITY →ACCURACY OF PRODUCT INFORMATION	6.25*	0.54	0.41	5.08*	0.69	0.48	$10.68^{*}$	0.76	0.58
RELIABILITY → VALUE FOR MONEY	6.65*	0.72	0.52	5.07*	0.69	0.48	$11.88^{*}$	0.85	0.72
RELIABILITY → ACCURACY OF INFORMATION IN ADS	6.66*	0.73	0.53	5.14*	0.73	0.53	10.99*	0.78	0.61
RELIABILITY → KNOWLEDGABLE SALESPEOPLE		0.55	0.30		0.42	0.17		0.73	0.53
RELIABILITY → PRICE-QUALITY FIT	5.55*	0.53	0.28	4.30*	0.47	0.22	$11.61^{*}$	0.83	0.68
WELCOMENESS →INTERIOR DESIGN		0.55	0:30		0.82	0.67		0.74	0.55
WELCOMENESS → WINDOW DISPLAY	3.43*	0.67	0.45	7.30*	0.72	0.52	$10.44^{*}$	0.83	0.69
WELCOMENESS → IN STORE MUSIC	2.86*	0.30	0.088	6.34*	0.54	0.30	9.20*	0.70	0.49
	GFI=0.9	3, AGFI=0.90,	CFI= 0.9	4,GFI=0.95	5, AGFI=0.90,	CFI=0.98	3,GFI=0.90	), AGFI=0.87,CFI	= 0.90
Output Dist.	RMSEA	=0.033, X262=9	96.34, <sub>X</sub> 2	/RMSEA=	0.031, X262=7	'3.67, <u>X</u> 2	/RMSEA=	0.074, X262=259	.78, X2/
	Af-1 CC			df-1 19			01 4 31-		

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\*Significant at p ≤ 0.05

Table 6. The Latent Variable Correlation Matrix: Discriminant Validity

		Reliability	Pleasantness	Welcoming
	Reliability	0.62		
Teknosa (n=384)	Pleasantness	0.30	0.67	
	Welcomeness	0.41	0.18	0.53
	Reliability	0.61		
MediaMarkt (n=210)	Pleasantness	0.57	0.65	
	Welcomeness	0.43	0.33	0.70
	Reliability	0.79		
Vatan Computer (n=158)	Pleasantness	0.68	0.75	
	Welcomeness	0.74	0.52	0.76

Note: Square root of AVE is on the diagonal.

The values of some other goodness-of-fit indices are the following: GFI<sub>TEKNOSA</sub> = 0.93, AGFI<sub>TEKNOSA</sub> = 0.90, CFI<sub>TEKNOSA</sub> = 0.94, RMSEA<sub>TEKNOSA</sub> = 0.033,  $\chi^2/$ df<sub>TEKNOSA</sub>=1.55; GFI<sub>MEDIAMARKT</sub>=0.95, AGFI<sub>MEDIAMARKT</sub>=0.90, CFI<sub>MEDIAMARKT</sub>=0.98,  $RMSEA_{MEDIAMARKT} = 0.031, \chi^2/df_{MEDIAMARKT} = 1.18; GFI_{VATAN} = 0.90, AGFI_{VATAN} = 0.87,$ CFI<sub>VATAN</sub>= 0.90, RMSEA<sub>VATAN</sub>=0.074,  $\chi^2/df_{VATAN}$ =4.19. Therefore, the three store personality factors determined perceived store personality, thus H3 is supported. The factor "reliability" had the highest standardized regression coefficients among the three stores. This means that when "reliability" increases by one, the perceived store personality increases by 0.83; 0.86 and 0.98. In all three stores, the most important determinants for the "pleasantness" factor are "layout" ( $\beta_{Teknosa}=0.76$ ;  $\beta_{\text{MediaMarkt}} = 0.77; \quad \beta_{\text{Vatan}} = 0.82) \quad and \quad ``interior \ color'' \quad (\beta_{\text{Teknosa}} = 0.74; \quad \beta_{\text{MediaMarkt}} = 0.74; \quad \beta_{\text{M$  $\beta_{Varan}$ =0.83). The reliability factor derives mainly from the "accurate information in ads" ( $\beta_{\text{Teknosa}}=0.73$ ;  $\beta_{\text{MediaMarkr}}=0.73$ ) and "value for money" ( $\beta_{\text{Teknosa}}=0.72$ ;  $\beta_{MediaMarkr}$ =0.69) in Teknosa and MediaMarkt; "value for money" ( $\beta_{Varan}$ =0.85) and "price-quality fit" ( $\beta_{Varan}$ =0.83) in Vatan Computer. The highest coefficients for the "Welcomeness" factor were "window display" ( $\beta_{Teknosa}$ =0.67;  $\beta_{Vatan}$ =0.83) in Teknosa and Vatan Computer; "interior design" ( $\beta_{MediaMarkt}$ =0.82) in MediaMarkt.

#### **Conclusion and Implications**

The consumer electronics market is one of the fastest growing in Turkey. In recent years, the entry of global chain stores into the Turkish market and the extension policies of local chain stores have increased competition in this sector. As 34.6 % of

the population in Turkey comprises young people (TSI, 2011, p. 13), the interest in consumer electronics is growing rapidly, thus forcing consumer electronics retailers to be more innovative in the diversification of their marketing and positioning strategies. However, it can be seen that there is insufficient diversity in the retailing mix policies and strategies among the retailers with regard to factors such as goods and services offered, store location, operating procedures, pricing tactics, store atmosphere, customer services and promotional methods. Within this context, the purpose of this study is to identify and compare the determinants of the most preferred consumer electronics chain stores' personalities, as perceived by a representative sample of Turkish university students. It aims to explore the factors that make up the specific store personality determinants in a consumer electronics chain store context. The reason for this is the critical need for the most popular electronics product chain stores to differentiate and gain competitive advantage, especially for young consumers such as university students, who represent an important section of this market (Accenture, 2012, p. 15).

In the literature, there are few studies relating to store personality. This concept was firstly introduced by Martineau (1958), who mainly focused on store image attributes in defining store personality, while d'Astous and Levesque (2003) developed a *"general"* store personality scale based on Aaker's (1997) brand personality dimensions. Additionally, Brengman and Willems (2008) developed a scale using retailing mix, aimed specifically at "fashion stores". As the scales developed in these studies are generalized and context based, they are not appropriate for consumer electronics chain stores. Accordingly, these studies have been utilized as the basis for a new scale specifically designed to gain an understanding of university student perceptions of chain stores in the electronics sector.

The findings of the present study contributes to the literature by developing and validating a store personality scale specifically for consumer electronics retailers based on university students' perceptions of store personality determinants. In the Turkish market, Teknosa, MediaMarkt and Vatan Computer were selected as the most preferred chain stores. In the study, in order to identify specific factors of store personality, EFA was conducted and three factors were identified: "reliability", "pleasantness" and "welcomeness". Following this, CFA was performed on these factors and a confirmatory factor analytic model was generated. First-order models with correlated factors were performed to examine the construct more closely, while second-order factor analysis was used to define the most important factors and determine the relative importance of each factor to the overall, for each

chain store (Correia, *et al.*, 2008, p. 173). The results indicate that "reliability" is perceived to be the most important factor in all three stores. In contrast, factors that are perceived to be least important by university students were "pleasantness" for Vatan Computer and Teknosa, "welcomeness" for MediaMarkt. One of the most important items perceived was "Value for money", which explains "reliability" factor in all three store. This is due to the fact that purchasing electronic products requires high involvement which means that consumers put a greater emphasis on finding information about brands and products when making purchases. Moreover, in Teknosa and MediaMarkt, "accurate information in the advertisements" of the stores and in Vatan Computer "price-quality fit" best explains the "reliability" factor.

The second store personality factor, "pleasantness" is found to be best explained by "layout" and "interior design" in all three stores. "Window display" is very much related with the "welcomeness' factor in Teknosa and Vatan, while "interior design" is the most important item in explaining this factor in MediaMarkt.

These findings emphasize the need for accurate information in the purchasing decision making process for high-involvement products, such as consumer electronics (Ahmed, *et al.*, 2004). Young consumers prefer a reliable store that gives accurate information, value for money and has price-quality fit. In addition, the store atmosphere and merchandise are perceived as the most important determinants of store personality by university students. This may be due to the need for young consumers e.g. university students, to be able to touch, hear and even smell products, as well as see them, which contributes to a pleasant shopping experience and a feeling of being welcome in the store.

Considering these findings, in order to increase the reliability of such stores it may be appropriate to recommend that managers ensure that sales personnel are provided with information relative to the products, as well as the price. This is considered to promote sales. In addition, stores should avoid misleading advertising and sales promotions as this can cause store avoidance. In order to prevent this problem and assist in monitoring students' buying habits, loyalty cards can be given to contracted universities. Also, detailed explanations regarding the usage of products can be given on their web sites in the form of videos. Another vital measure is to improve after-sales service, such as maintenance, installation, and repair and even offer replacement with another product where necessary. Considering of the importance of the university market, it would be very useful for chain stores to promote their most popular products at university festivals, organize a variety of events and give special incentives to students, in order to capture these potential long term customers of the future. As argued by Brengman and Willems (2009), it may be appropriate to propose that the managers of store chains should reduce the perception of overcrowding by rearranging the layout to facilitate shopping and in store traffic flow, to create a more pleasant store atmosphere. Managers may be encouraged to develop strategies for relieving congestion in crowded areas such as entrance, halls, cash register locations, customer services and shopping areas. This study shows the potential for a store-personality scale developed for consumer electronics chain stores in helping retailers understand the perception of young customers. This understanding can enable stores to reposition themselves in a competitive market by implementing an integrated communication strategy.

The main academic contribution of this study is that it can be seen as a preliminary effort to identify the most distinctive personality factors and determinants of consumer electronics chain stores perceived by university students in Turkey. As consumer electronics stores and their personality characteristics have received a limited amount of research attention in the marketing literature, this study is expected to be useful for potential domestic and foreign consumer electronics retailers investing in this sector.

#### Limitations and Future Research

This study has a number of limitations. In sampling design in particular, due to budget limitations, the use of convenience sampling method in only one metropolitan city, Izmir, and one university may not represent the general perceptions of Turkish university students. However, despite its limitations, this study can be seen as a preliminary effort in analyzing the perceptions of Turkish university students, a highly profitable segment of the market (Accenture, 2012, p. 15).

In his study, Martineau (1958) mostly focused on store image attributes to define store personality, while d'Astous and Levesque (2003) utilized Aaker's (1997) brand personality dimensions to develop a *"general"* store personality scale. Additionally, Brengman and Willems' (2008) developed a scale only for *"fashion stores"*, which is therefore unsuited to consumer electronics. The scale developed in this study can only be applied to consumer electronics chain stores, because it includes specific determinants. Additionally, this scale can be used to measure the effect of store personality determinants on store loyalty, store image and alternative methodologies, including the usage of both qualitative and quantitative techniques. This process would be able to provide a deeper understanding of consumer perceptions and attitudes.

Further studies can be made into different types of retailers, as well as customer segments from other countries in order to explore the effects of cultural differences. In addition, further research conducted on a wider sample size involving other universities in Izmir and other metropolitan cities would allow a stronger representative view.

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# The Role of Twin Deficits Problem in Sustainable Growth: An Econometric Analysis for Turkey

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#### ABSTRACT

In economics literature the relationship between budget deficit and current account deficit is known as twin deficits hypothesis. The Keynesian KEYWORDS Approach accepts a relationship between two deficits. In contrast to Budget Deficit, Current Account this, Ricardian Equivalence Hypothesis defends there is no relationship between these two deficits. Twin deficits have become the subject of several studies to test which of these hypotheses are reliable but no consensus has been achieved. Some studies found a relationship from budget deficit to current account deficit but some of them had the opposite result. Especially after 1980 it is known that many developed and developing countries ARTICLE HISTORY encountered with this twin deficits problem. Turkey also has the problem of twin deficits. Therefore, it is important to find whether there is causality between them and the direction of this causality.

In this study the relationship between budget deficit and current account deficit is examined by using Johansen Cointegration Analysis. This study is based on period 1996:Q1-2011:Q4. According to results of cointegration; variable coefficients are statistically significant and consistent with what we expected in hypotheses. Current account deficit (CAD) has a significant negative effect on budget deficit (BD). When there is a 1% increase in CAD, BD decreases 0,12%. This finding is consistent with economic theory because according to Keynesian Approach two deficits have relationship with each other. However, in contrast to this approach, the direction is from CAD to BD and also coefficient is negative.

JEL Codes: H62, F32, O4

Deficit, Sustainable Growth, Econometric Modelling, Turkey

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#### Introduction

The twin deficits problem is referred to a situation where an economy is running both Current Account Deficit (CAD) and Budget Deficit (BD). According to Ricardian Equivalence CAD and BD are not correlated. Budget deficit is a result of tax cut which reduces public revenues and public saving (Alkswani, 2000). Decrease in public savings will be compensated by an increase in private saving. Therefore national saving will not be affected and the budget deficit will have no effect on the current trade deficit (Alkswani, 2000). On the other hand, according to Keynesian proposition the two deficits are linked and the direction is from BD to CAD. Because if there is a budget deficit, government has to borrow more and as a result the interest rates rise. The rise of interest rates leads inflow of money from abroad and then the local currency appreciates. The appreciation of currency results with increase in import and decrease in export. As a result, trade deficit increase and current account balance distorted.

The twin deficits have started to become a problem with the beginning of the 1980's in USA. Increase in military expenditures and decrease in income tax raised budget deficit. The increase in budget deficit caused increase in debt of US to the rest of the world and therefore caused distortion in balance of payments. After the global crisis in 2008, it is seen that not only in USA also in other developed and developing countries have the same macroeconomic problems. Especially in developed countries such as European countries faced with serious problems in their economies. Growth in developing economies such as China and India has become a danger for developed countries. Foreign trade worsened and caused decrease in balance of payments in western countries. Also high borrowing of governments deepened crisis in European countries.

In recent years, CAD has become the most discussed issue for Turkey's Economy. According to Peker (2009) macroeconomic policies such as inflation targeting generally cause appreciation of local currency and thus stimulate import. Turkey has lack of savings like other developing countries. Because of this, growth in economy depends on import oriented production and consumption. Although Turkish Economy performs high level of growth, the trade balance is worsening. In the last decade Turkish foreign trade has showed a large increase. However, increase in trade volume has become more than increase in export. Also increase of gas and oil prices in the world has increased Turkey's energy expenditure. Therefore trade balance and also current account balance worsened. After the 1999 earthquake and 2001 crisis, fiscal policies tightened and to increase the revenues new tax policies have been implied. Especially new taxes such as Private Consumption Tax (PCT) on import oriented goods have been implied to help improving budget balance. Especially PCT revenues on petroleum products, almost totally import oriented, helped to finance the budget deficit. Tax burden is 20% in 2011 which was 13% in 1998. Also share of value-added taxes (VAT) from import in total value-added tax revenues raised to 17% which was 11% in 1999. The gap between domestic VAT and VAT from import is closed as of 2011.

The growth in economy and tightened fiscal policies reduced the vulnerability to crisis of Turkish economy. However, good performance of budget balance had no positive effect on balance of payments. Export-import ratio was under 70% except 2001 and 2009. After 2001 Trade deficit increased continuously and in period 1997-2004 CAD/GDP ratio was 1,1% but in period 2005-2010 the ratio raised to 5,1%.

Graph 1 shows the relation of BD and CAD in the last 15 years.

Figure 1. Budget Deficit and Current Account Deficit in Turkey, 1996-2011(millions of \$)



Source: Electronic Data Delivery System (EDDS), CBRT, 2012.

As seen in the figure, especially after the 2001, Current Account Balance continuously worsens. However, in this period Turkish economy experienced high growth rates. With the global financial crises in 2009 CAD decreases sharply. After that it increases sharply too. In this period BD moves in the opposite direction. According to graph, BD did not rise over 30 billion dollars except 2009. Shrink in economy and decrease in foreign trade decreased budget revenues in 2009. However in the last decade BD/GDP ratio decreased continuously and become -1.4% as of 2011. This ratio is less than 3% which is the reference value in Maastricht Criteria. As of 2011 most of the EU member countries do not meet this criterion.

In this paper it is discussed whether CAD and BD has a correlation with each other and if there is, in which direction is this relationship. According to hypothesis of this paper there is a correlation between these two deficits and it is negatively correlated. Because the increase in trade deficit increases the budget tax revenues and this help to decrease budget deficit.

#### Literature Review

In economic literature, there are many empirical researches that focused on twin deficits problem. In 1980's United States faced with increase in federal trade deficit (TD) and federal budget deficit together. After that the relationship between trade deficit and budget deficit has become an important subject for researchers.

Darrat (1988) tried to find the linkage between TD and BD by using data period 1960:I to 1984:IV for United States. He found the evidence of causality from budget deficit to trade deficit and stronger causality from trade to budget deficit by using multivariate Granger Causality Test.

In the other study for the U.S., Enders and Lee (1990) searched the relationship between BD and CAD in period 1947 to 1987 by using VAR analysis. They found that government spending innovation generates a persistent current account deficit.

Also, Abelln (1990) examined the relationship between federal budget deficits and merchandise trade deficit for U.S. He used multivariate time series within autoregressive model for period 1979:02 through 1985:02. He found that indirectly budget deficits affect trade deficits.

Another work on US budget deficit and current account deficit linkage is study of Bahmani-Oskooee (1989). He examined the linkage in period 1973-1985 and concluded that the budget deficit contribute to current account deficit.

Not only U.S. but also other countries are faced with this twin deficits issue. Therefore, there are studies about other countries too. Islam (1998) examined the casual relationship between budget deficits and trade deficits of Brazil from 1973:1Q through 1991:Q4. The results suggested that there is a bilateral causality between them.

Vamvoukas (1999) used annual data in period between 1948 and 1994 for Greece. He used error correction model for the analysis and found that budget deficit has short and long run positive and significant causal effects on trade deficit.

Alkswani (2000) studied on twin deficits problem in petroleum economy by using Saudi Arabia annual data from 1970 to 1999. In his empirical analysis he used ECM, Johansen cointegration and Granger bivariate causality tests and as a result found that trade deficit causes budget deficit.

Puah et al. (2006) analyzed the twin deficits debate in Malaysia and Johansen-Juselius co-integration test results show that budget deficit and current account deficit do not contain common stohastic trend in long run. In addition unidirectional causality running from current account to budgetary variable where the deterioration in current account deficit could worsen the budgetary position in the case of Malaysia.

Merza et al. (2012) examined twin deficits hypothesis for Kuwait for the quarterly period (1993:4-2010:4). To analyze the relationship between variables they applied the VAR model and tested for existence and the direction of causality and the results show that the direction of causality current account to budget balance that is an increase in current account causes a decrease in the government budget surplus or an increase in budget deficit.

Also in Turkey, there are many studies focusing on Turkey's twin deficits problem. Some of these studies are Ay, et al.(2004), Aksu and Başar (2005), Utkulu (2003), Yücel and Ata (2003), Kutlar and Şimşek (2001), Zengin (2000), Sever and Demir (2007), Akbostancı and Tunç (2002). Some of them used current account deficit variable and some used trade deficit variable in their empirical studies. Most of them used quarterly data for Turkey. Akbostancı and Tunç (2002) used quarterly variables between 1987:Q1 and 2001:Q3. They used Budget balance and trade balance as a percentage of GDP. By using ECM and Cointegration analysis the empirical results show that there is a long run relationship between two and in the short run worsening of budget balance worsens trade balance.

Sever and Demir (2007) used quarterly data between the years 1987 and 2006 to examine the relationship of budget deficit with current account deficit. By using stationarity test, granger causality test and VAR analysis they found that budget deficit influence current account deficit indirectly.

Kutlar and Şimşek (2001) used budget deficit and trade balance seasonally adjusted data in log form in period 1984(4) through 2000(2). In the analysis stationarity test, granger causality test, misspecification test, cointegration test and ECM used and found that there is a positive relationship between two variables and trade deficit increase budget deficit.

Zengin (2000) used seasonally adjusted quarterly data for period 1987:I through 1998:I. The main variables are trade deficit and consolidated budget deficit as ratios to GNP. In the analysis VAR, Variance decompositions and impulse response function used. The result of the empirical analysis is that budget deficit influence trade balance.

Yücel and Ata (2003) used yearly data from 1975 to 2002. The variables are current account deficit and budget deficit both in log form. The result of the empirical analysis is that there is a cointegration between CA and BD and there is a long run positive relationship. Granger causality test results say that causality is from BD to CA in lag(1) and causality is from CA to BD in lag (3,4 and 7).

Utkulu (2003) used budget deficit and trade deficit variables as yearly data in period between 1950 and 2000. By using cointegration analysis and ECM, he found that there is a two sided long run causality between budget and trade deficits.

Ay et al.(2004) used monthly data between 1992 and 2003 for the empirical analysis to find the linkage between BD and CAD. The variables used in the empirical analysis were in percentage of GDP. They used Granger Causality test and regression analysis. According to the empirical analysis there is reciprocal relationship between two variables. According to two regression analysis the coefficients are positive.

#### Model, Method and Data Set

In this section, a multivariate model has established to investigate twin deficits problem in Turkey.

 $BD = \beta_0 + \beta_1 CAD + U_t \tag{1}$ 

Where BD, CAD, are budget deficit and current account deficit respectively. Budget deficit (BD) is generally defined as an amount by which some measure of government expenditure and some measure of government revenue. BD is dependent variable, whereas, current account is independent variable in this model. And current account deficit (CAD) Current account deficit includes foreign trade in goods, services and transfers. Current account occurs when a country's total import of goods, services and transfers is greater than total export of goods services and transfers. Many studies in the literature use BD as an independent variable. But in this study BD is used as dependent variable unlike other studies.

This paper adopted the method of co-integration first found by Engle-Granger (1987), developed by Johansen (1988) and applied by Johansen and Juselius (1990). This method depends on direct investigation of co-integration in the vector autoregressive (VAR) representation and produces maximum likelihood estimators of the unconstrained co-integration vector, but it allows one to explicitly test for number of co-integration vectors. Johansen's methodology takes its starting points in the vector auto regression (VAR) of order p given by;

$$y_t = A_1 y_{t-1} + \dots A_p y_{t-p} + B_{xt} + \varepsilon_t$$
 (2)

Where yt is a k vector of non-stationary variables I(1), xt is a d vector of deterministic variable; and  $\mathbf{E}_{r}$  indicates an innovation vector. This VAR can be written as;

$$\Delta \mathbf{y}_t = \pi \mathbf{y}_{t-1} \sum_{i=1}^{p-1} \tau_i \, \Delta \mathbf{y}_{t-1} + \mathbf{B} \mathbf{x}_t + \varepsilon_t$$

where

$$\pi = \sum_{i=1}^{p} A_i - I, \tau_i = -\sum A_j.$$

Where cointegration hypothesis defined as a reduced rank of the matrix  $\pi$  is stated in the form of  $\pi = \alpha\beta$ .  $\alpha$  and  $\beta$  represent the two matrix which have (kxr)-dimensional and r rank. r is the number of co-integration (rank),  $\beta$  is a co-integration vector showing long-term effects of variables in the equilibrium relations and  $\alpha$  indicates speed of adjustment in error correction model. Accordingly an matrix  $\pi$  is estimated from an unrestricted VAR in Johansen method and tested that specified conditions with reduced rank of  $\pi$  rejected or not. And determined by the help of Johansen method's test statistics ( $\lambda$ trace and  $\lambda$ mak) how many rank of the matrix  $\pi$  has. In this context, the data set of the variables used to determine the twin deficits problem in Turkey belong to 1996:Q1-2011:Q4 period. All data were taken from Electronic Data Delivery System (EDDS) published by the Central Bank of the Republic of Turkey (CBRT). And Econometric Views (Eviews 5.1) software program was used for all tests and estimates.

#### **Empirical Results and Discussion**

Before constructing the Johansen method, it is important to make some process and pre-tests. Univariate time series of variables are checked by using Augmented Dickey Fuller (ADF) (1979) unit root test. ADF unit root test results can be seen in Table 1. Variables were initially tested with first-level values and then tested with the levels of receipt of the first differences. Accordingly determined that all variables are integrated in the same order I(1). Therefore the necessary pre-condition for cointegration is provided.

#### Table 1. ADF Unit Root Test

Variables	ADF Test	Critical Values 1%
BD	-2.318258 [3]	-4.1118
CAD	-3.353061 [1]	-4.1104
ΔBD	-9.694507 [2]	-3.5440
ΔCAD	-4.617754 [6]	-3.5526

Note: Trend and intercept term is used as test type for BD and CAD variables, but only intercept term is used for the first differences of variables ( $\Delta$ ). The values in square brackets indicates appropriate length of delay according to AIC.

It is necessary to determine an optimum number of delay to apply Johansen method. There are many measurements in the literature to determine the length of delay; Akaike Info Criterion, Schwarz Info Criterion, Hannan-Quin Criterion and Recent Forecast Error Criterion are the most commonly used (Johansen, 1995; Enders, 1995). But these criterions are not enough on their own. Also there should not be econometric problems in the length of delay selected with info criterions. According to this, in this model the length of delay is determined as two. In this context the model presented in Table 2 shows forecasting of diagnostic test is successful.

#### Table 2. Diagnostic Test Results

White Heteroskedasticity Chi-sq Df Prop 14.897 18 0.669 Normality Test Jarque-Bera Df Prop 0.203535 2 0.9032 0.633672 0.7285 2

After checking univariate of all time series variables the relation between BD and CAD variables can be tested by co-integration test. The purpose of the co-integration test is to determine whether a group of non-stationary series is co-integrated or not.

According to Table 1, all variables are I(1), that means co-integration relation between BD and CAD can be investigated by using Johansen Co-integration Method. The results of  $\lambda$ trace and  $\lambda$ mak statistics are presented in Table 3.  $\lambda$ trace and  $\lambda$ mak statistics helps to find existence of co-integration and number of vectors. According to the statistics; the null hypothesis (there is no co-integration relation

(3)

(4)

between variables), is rejected against to alternative hypothesis (there is at least one co-integration relationship between the variables). In this case, there has to be at least one co-integration relationship at 5 % critical value.

#### Table 3. Co-integration Test

Null Hypothesis (H0)	Alternative (H1)	Hypothesisis	Eigenvalue	Trace and Mak Sta- tistics	5% Critical Value
λТгасе				$\lambda$ Trace statistic	
r = 0	r > 0		0.309956	23.57399	15.49471
r ≤ 1	r > 1		0.009183	0.571998	3.841466
λMak				$\lambda$ Mak statistic	
r = 0	r = 1		0.309956	23.00199	14.26460
r = 1	r = 2		0.009183	0.571998	3.841466

The co-integration equation is presented in Table 4. According to results of cointegration; variable coefficients are statistically significant and consistent with what we expected in hypotheses. CAD has a significant negative effect on BD. When there is a 1% increase in CAD, BD decreases 0,12%. This finding is consistent with economic theory because according to Keynesian Approach two deficits have relationship with each other. However, in contrast to this approach, the direction is from CAD to BD and also coefficient is negative.

#### Table 4. Co-integration Equation

	BD	CAD
Normalized Co-integration coefficient ( $\beta'$ )	1.000	0.122535 (0.08580)
Adaptation rates coefficient ( $\alpha$ )	-0.000427 (7.68E-05)	-5.23E-05 (0.00019)
Co-integration Equation	BD= 5001.857 - 0.1225	35CAD

If there is a co-integration relationship among non-stationary variables, there has to be an error correction representation (Engle and Granger, 1987) which illustrates the dynamic convergence of the system to the long-run equilibrium. A precondition for the existence of co-integration is that all the variables are integrated of the same order. If this is fulfilled, then the residuals from the long-run estimates can be used as the error correction term (ECT) to explain the short run dynamic. The error correction term in short run indicates that when the deviations in the short run will be adjusted in the next period (Cholifihani, 2008).

Error correction model (vector error correction: VEC) was established in order to investigate the short-run dynamics of variables acting together in the long-run and the results are presented in Table 5. As seen in Table 5; coefficient of error correction term (ECt-1) is statistically significant and negative. If the error correction term is negative, that means deviations in the short-run will be eliminated and series converges to the long-run equilibrium value again among the series moving together in the long-run. Namely error correction term is good working. According to the result approximately 87 % of deviations from the long-run equilibrium value eliminate in each period.

#### Table 5. Error Correction Model Estimation Results

	$\Delta BA_t = \beta_0 + \beta_1 \Delta t$	$CA_{t-1} + \alpha EC_{t-1} + ut$	
Variables	Coefficient	t-statistic	
DBAt-1	-0.049275	-0.33937	
DCAt-1	-0.247044	-1.45152	
ECt-1	-0.874470	-4.69637	
Invariable term	-138.1142	-0.31490	
R2 = 0.46	$\overline{R}^2 = 0.44$ F = 17.12		

#### Conclusion

In this paper we tested whether there is a relationship between BD and CAD in Turkey with the framework of growth. In the last decade, Turkey's economy performed well. After the 2001 crisis new economic policies strengthened the economy against

crises. With the help of tight fiscal policies, government did not compromise on the budget. However increase in consumption, appreciated currency, lack of savings and rise in price of energy products caused an increase in trade deficit. As a result current account deficit rose. According to empirical results there is a significant negative correlation between BD - CAD and the direction is from CAD to BD. When there is a 1% increase in CAD, BD decreases 0,12%. Many studies on Turkey do not cover last decade's data. But in this study we reflect the effects of structural changes in Turkish Economy after the period 2001 in terms of BD and CAD. In this regard, empirical results of this study are differentiated from others. Because many studies in literature show that incease in CAD results from incease in CAD decrease in BD. It is possible to say that Turkey's fiscal, tax and growth policies in the last periods provide this conclusion. That is to say, an increase in CAD helps to fix the budget balance. 2/3 of tax revenues come from indirect taxes which means most of tax revenues in Turkey come from consumption tax.

It seems that economic growth in Turkey bases on consumption and this case results with CAD. This is not a sustainable situation. Because, a period of slowdown in the economy causes not only a decrease in CAD but also a deterioration of budget balance. This situation reduces the credibility of the government and the economy. Therefore Turkish economy has to cope with CAD not with tax policies but with increasing production facilities. If not, the economy may face with both deficits at the same time.

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# Cox Regression Models with Time-Varying Covariates Applied to Survival Success of Young Firms 1(\*)

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#### ABSTRACT

#### The most widely used model in multivariate analysis of survival KEYWORDS data is proportional hazards model proposed by Cox. While it is easy Survival Analysis, Cox Regression to get and interpret the results of the model, the basic assumption of Model, Proportional Hazard proportional hazards model is that independent variables assumed Assumption, New Firms to remain constant throughout the observation period. Model can give biased results in cases which this assumption is violated. One ARTICLE HISTORY of the methods used modelling the hazard ratio in the cases that the Submitted:22 Jun 2012 proportional hazard assumption is not met is to add a time-dependent Resubmitted:03 January 2013 variable showing the interaction between the predictor variable and a parametric function of time. In this study, we investigate the factors that affect the survival time of the firms and the time dependence of these factors using Cox regression considering time-varying variables. The firm data comes from Business Development Centers (İŞGEM) which is a prominent business incubation center operating in Turkey. Jel Code: C41, C24, M13

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#### Introduction

Survival analysis deals with the probability of occurrence of a given event at a set of particular points in a time interval (Cox and Oakes, 1984; Sertkaya, Ata and Sözer, 2005). In the small business and entrepreneurship literature, survival analysis has been used to track the start-ups over the years. The typical survival anaylsis may include the reports of hazard rates, ratios and survival curves while relating a likely set of independent variables to a specific event. A survival curve of a cohort of newly established firms reports what percentage of the cohort continue to survive since its inception over time, indicating whether some of the firms are failed over the years (Karaöz and Albeni, 2011). In many survival studies, it has been examined whether some variables or risk factors are effective on survival or not. Cox proportional hazards (PH) model is the most preferred model in order to investigate the effect of variables on survival time. The key assumption of Cox model is that hazard rate related to different levels of the factors is constant throughout the follow-up period (Başar, 2006). Violation of the PH assumption requires additional measures for unbiased results of Cox survival regression. In this paper, Cox regression has been applied to investigate the survival of newly established firms under incubation. Violation of PH assumption has been tested and further Cox regressions are performed considering time-varying effects of independent variables to survival.

#### **Survival Analysis**

Survival analysis is a collection of statistical procedures for data analysis for which the outcome variable of interest is time until an event occurs (Harrell, 2001). This event may be failure, and for this reason, the analysis of such data is often referred to as survival analysis (Bellera et al., 2010). The main objectives of the survival analysis are i) to estimate and interpret survival characteristics: Kaplan-Meier plots, median estimation and confidence intervals (CI), ii) to compare survival in different groups: Log-rank test, iii) to assess the relationship of explanatory variables to survival time: Cox regression model (Yay, Çoker and Uysal, 2007).

In a survival analysis, it is usually referred to the time variable as **survival time**, because it gives the time that an individual has "survived" over some followup period (Geiss et al., 2009). It is also typically referred to the event as a **failure**, because the

event of interest usually is death, disease incidence, or some other negative individual experience (Kleinbaum and Klein, 2005).

When survival time (*T*) is defined as a random variable with cumulative distribution function  $P(t) = Pr(T \le t)$  and probability density function P(t) = dP(t)/d(t), survival function S(t) is explained by Equation (2.1) (Yay, Çoker and Uysal, 2007);

$$S(t) = P(T > t) = 1 - P(t)$$
 (2.1)

Survival function S(t) gives the probability that the random variable T exceeds the specified time t (Kleinbaum and Klein, 2005). All survival functions have the characteristics that i) they are nonincreasing; that is, they head downward as tincreases, ii) at time t = 0, S(t) = S(0) = 1; that is, at the start of the study, since no one has gotten the event yet, the probability of surviving past time 0 is one, iii) at time  $t = \infty$ ,  $S(t) = S(\infty) = 0$ ; that is, theoretically, if the study period increased without limit, eventually nobody would survive, so the survival curve must eventually fall to zero (Kleinbaum and Klein, 2005).

The hazard function h(t), with its complement of survival function S(t), is given by Equation (2.2), where  $\Delta t$  denotes a small interval of time (Kleinbaum and Klein, 2005);

$$h(t) = \lim_{\Delta t \to 0} \frac{P(t \le T < t + \Delta t | T \ge t)}{\Delta t}$$
(2.2)

The hazard function h(t) gives the instantaneous potential per unit time for the event to occur, given that the individual has survived up to time t (Tabatabai et al., 2007). In contrast to the survival function, which focuses on *not* failing, the hazard function focuses on failing, that is, on the event occurring. Thus, in some sense, the hazard function can be considered as giving the opposite side of the information given by the survival function (Kleinbaum and Klein, 2005).

#### The Cox Proportional Hazards Model

The Cox PH model is usually written in terms of the hazard model formula shown at Equation (2.3). This model gives an expression for the hazard at time t

for an individual with a given specification of a set of explanatory variables denoted by X. That is, X represents a collection of predictor variables that is being modeled to predict an individual's hazard (Kleinbaum and Klein, 2005);

$$h(t, X) = h_0(t) e^{\sum_{i=1}^{p} \beta_i X_i}$$
(2.3)

The Cox model formula says that the hazard at time t is the product of two quantities. The first of these,  $h_0(t)$ , is called the **baseline hazard** function. The second quantity is the exponential expression e to the linear sum of  $\beta_i X_i$ , where the sum is over the p explanatory X variables (Kleinbaum and Klein, 2005).

In general, a hazard ratio (*HR*) is defined as the hazard for one individual divided by the hazard for a different individual. The two individuals being compared can be distinguished by their values for the set of predictors, that is, the X's. Hazard ratio is shown by the following formula, where  $X^*$  denotes the set of predictors for one individual, and X denotes the set of predictors for the other individual (Kleinbaum and Klein, 2005);

$$\widehat{\mathrm{HR}} = \frac{\widehat{h}(\mathbf{t}, \mathbf{X}^*)}{\widehat{h}(\mathbf{t}, \mathbf{X})} = \frac{\widehat{h}_0(\mathbf{t}) \exp[\Sigma \,\widehat{\beta}_i X_i^*]}{\widehat{h}_0(\mathbf{t}) \exp[\Sigma \,\widehat{\beta}_i X_i]} = \exp\left[\sum_{i=1}^p \widehat{\beta}_i \left(X_i^* - X_i\right)\right]$$
(2.4)

 $X^* = (X_1^*, X_2^*, \dots, X_p^*)$  and  $X = (X_1, X_2, \dots, X_p)$  denote the set of X's for two individuals.

Once the model is fitted and the values for  $X^*$  and X are specified, the value of the exponential expression for the estimated hazard ratio is a constant, which does not depend on time. If we denote this constant by  $\theta^{\circ}$ , then hazard ratio can be written as shown below (Kleinbaum and Klein, 2005);

 $\hat{\theta} = \exp\left[\sum_{i=1}^{p} \hat{\beta}_i (X_i^* - X_i)\right]$ (2.5)

If hazard ratio is greater than 1, the group which has the distinction of 1 category of the variable will higher significantly likely to be exposed to interest event by comparison 0 category of that variable. If the hazard ratio is equal to 1, chance of closing the two groups are equal; if it is between 0 and 1, the group receiving 0 category value has a lower closing probability by comparison 1 category.

The basic assumptions of the Cox regression model can be explained as follows (Yay, Çoker and Uysal, 2007); i) the effects of independent variables on the hazard function are loglinear. ii) The relationship between loglineer function of independent variables and the hazard function is multiplicative. iii) In addition to these two assumption, observations should independent of each other and hazard ratio should remains unchanged with respect to time, ie., is constant. This assumption related to hazard ratio is known as proportional hazard assumption.

A key reason for the popularity of the Cox model is that, even though the baseline hazard is not specified, reasonably good estimates of regression coefficients, hazard ratios of interest, and adjusted survival curves can be obtained for a wide variety of data situations. Another way of saying this is that the Cox PH model is a "robust" model, so that the results from using the Cox model will closely approximate the results for the correct parametric model (Kleinbaum and Klein, 2005).

In addition to the general "robustness" of the Cox model, the specific form of the model is attractive for several reasons (Kleinbaum and Klein, 2005). First, the exponential part  $e^{\sum_{i=1}^{p} \beta_i X_i}$  of hazard model ensures that the fitted model will always give estimated hazards that are non-negative. Another tempting property of the Cox model is that, even though the baseline hazard part of the model is unspecified, it is still possible to estimate the  $\beta$ 's in the exponential part of the model. Lastly, it is preferred over the logistic model when survival time information is available and there is censoring. That is, the Cox model uses more information (the survival times) than the logistic model, which considers a (0,1) outcome and ignores survival times and censoring.

#### **Evaluating the Proportional Hazards Assumption**

For variables not satisfying the non-proportionality assumption, the power of the corresponding tests is reduced, that is, it is less likely to conclude for a significant effect when there is actually one. If the hazard ratio is increasing over time, the estimated coefficient assuming PH is overestimating at first and underestimating later on. For those variables of the model with a constant hazard ratio, the power of tests is also reduced as a consequence of an inferior fit of the model (Bellera et al., 2010).

There are three general approaches to assess the PH assumption: 1) Graphical Approaches; Kaplan-Meier and log-log plots, observed versus expected plots, 2) Goodness of fit (GOF) test, 3) Statistical Methods; schoenfeld residuals, the log-rank test and time-dependent covariates.

#### Extension of the Cox Proportional Hazards Model

An important feature of this formula, which concerns the PH assumption, is that the baseline hazard is a function of t, but does not involve the X's. The X's in the formula are called **time-independent** X's (Kleinbaum and Klein, 2005). It is possible, nevertheless, to consider X's which do involve t. Such X's are called **time-dependent** variables. If time-dependent variables are considered, the Cox model form may still be used, but such a model no longer satisfies the PH assumption, and is called the **extended Cox model** (Kleinbaum and Klein, 2005).

In the case of being time-dependent explanatory variables, Cox regression model expands to a model which contains time-independent variables and some functions of the time the product with these variables. Independent variables are, where  $X_1, X_2, ..., X_{p_1}$  time-independent variables and  $X_1(t), X_2(t), ..., X_{p_2}(t)$  time-dependent variables (Sertkaya, Ata and Sözer, 2005);

$$\mathbf{X}(t) = \left(X_1, X_2, \dots, X_{p_1}, X_1(t), X_2(t), \dots, X_{p_2}(t)\right)$$

as shown. Accordingly, Cox regression model is,  $\beta$  and  $\delta$  which denote vector of coefficients of explanatory variables (Sertkaya, Ata and Sözer, 2005);

$$h(t, \mathbf{X}(t)) = h_0(t) \exp\left[\sum_{i=1}^{p_1} \beta_i X_i + \sum_{j=1}^{p_2} \delta_j X_j g(t)\right]$$
(2.6)

as written. Where g(t) is defined as a function of time. Selection of g(t) varies according to the state of the variables used and according to the information level of the researchers. This function usually is defined in the form of t,  $\log(t)$ ,  $\ln(t)$  or step functions (Sertkaya, Ata and Sözer, 2005).

The general hazard ratio formula for extended Cox model is shown below (Kleinbaum and Klein, 2005);

$$\widehat{HR}(t) = \frac{\widehat{h}(t, X^{*}(t))}{\widehat{h}(t, X(t))} = \exp\left[\sum_{i=1}^{p_{1}}\widehat{\beta}_{i}[X_{i}^{*} - X_{i}] + \sum_{j=1}^{p_{2}}\delta_{j}[X_{j}^{*}(t) - X_{j}(t)]\right]$$
(2.7)

#### An Application Into New Firm Survival Under Incubation

Although the survival analysis extensively has been used in medical research on individuals, recently it becomes widely popular in business success and survival research. Thus, rather than on individuals, in this paper, we apply Cox regression to investigate the survival of newly established firms under incubation. There are studies applying survival violation of PH assumption has been tested and further Cox regressions are performed considering time-varying effects of independent variables to survival. Our 414 observations on firm characteristics acquired from 12 different incubators, İŞGEMs, located across Turkey, in Zonguldak, Tarsus, Ereğli, Eskişehir, Adana, Mersin, Van, Avanos, Samsun, Elazığ, Yozgat and Diyarbakır provinces. The data includes almost all firms that currently existing İŞGEMs or the firms that resided in the past yet left İŞGEMs by graduation or failure. The survey data consists of the total.

A business incubator can be identified as an organization which mentors the development of newly founded firms by specialized services such as providing office space, specialized staff, machinery, equipment, facilities and business assistance (Aernoudt, 2004). Thus a business incubator is a framework organization which contains a collection of newly established firms. İŞGEMs are one of the significant business incubation concept operating in Turkey.

#### Variables Used in the Analysis

For our analysis, factors affecting the initial success of young enterprises can be summarized as i) Human capital characteristics of new enterprise's owner such as education level and sector experience, ii) Firm characteristics such as scale, age and human capital, iii) Industry characteristics such as market growth rate and entry barriers, iv) Incubation features, v) Other external factors such as macroeconomic fluctuations, regional factors and public policies (Hackett and Dilts, 2004; Aernoudt, 2004). All of the data and variables used in our analysis are taken from Karaöz and Albeni (2011) and descriptive statistics and definitions are presented at

#### An Application Into New Firm Survival Under Incubation

Although the survival analysis extensively has been used in medical research on individuals, recently it becomes widely popular in business success and survival research. Thus, rather than on individuals, in this paper, we apply Cox regression to investigate the survival of newly established firms under incubation. There are studies applying survival violation of PH assumption has been tested and further Cox regressions are performed considering time-varying effects of independent variables to survival. Our 414 observations on firm characteristics acquired from 12 different incubators, *İŞGEMs*, located across Turkey, in Zonguldak, Tarsus, Ereğli, Eskişehir, Adana, Mersin, Van, Avanos, Samsun, Elazığ, Yozgat and Diyarbakır provinces. The data includes almost all firms that currently existing *İŞGEMs or* the firms that resided in the past yet left İŞGEMs by graduation or failure. The survey data consists of the total.

A business incubator can be identified as an organization which mentors the development of newly founded firms by specialized services such as providing office space, specialized staff, machinery, equipment, facilities and business assistance (Aernoudt, 2004). Thus a business incubator is a framework organization which contains a collection of newly established firms. *İŞGEM*s are one of the significant business incubation concept operating in Turkey.

#### Variables Used in the Analysis

For our analysis, factors affecting the initial success of young enterprises can be summarized as i) Human capital characteristics of new enterprise's owner such as education level and sector experience, ii) Firm characteristics such as scale, age and human capital, iii) Industry characteristics such as market growth rate and entry barriers, iv) Incubation features, v) Other external factors such as macroeconomic fluctuations, regional factors and public policies (Hackett and Dilts, 2004; Aernoudt, 2004). All of the data and variables used in our analysis are taken from Karaöz and Albeni (2011) and descriptive statistics and definitions are presented at Table 3.1. The entrepreneur's age, gender, education, professional career history and experience and family environment factors are the main factors in the literature in terms of the survival of firms (Karaöz and Albeni, 2011). Table 1. The variables used in analysis and descriptive statistics

VARIAB	LE	DEFINITION	Number of Observation	Mean	Minimum	Maximum
		EVENT OF INTEREST				
exit		If the firm is closed (failed) during or after the incubation 1, otherwise 0	414	-	0	1
		DEPENDENT VARIABLE				
incubag	ge	The elapsed time from the firm's entry into incubation until it's closed (month)	404	41,52	2	158
		INDEPENDENT VARIABLES				
æ	income	If entrepreneur's income only comes from the incubated firm 1, otherwise 0	414	-	0	1
RENEU	gender	If entrepreneur is female 1, male 0 (If there are both male and female partner 0)	414	-	0	1
HE ENTREF	Inentage	Entrepreneur's age (If there is a partner- ship, it is taken as the oldest entrepre- neur's age-logarithmic scale)	367	3,64	3	4,25
ISTICS OF T	enteduuni	If entrepreneur is a college graduate 1, otherwise 0 (if there is a partnership and one of the partners is college graduate 1)	414	-	0	1
RACTER	entexp	Entrepreneur's prior experience before arriving İŞGEM (year)	414	5,83	0	40
СНА	family	If there is a role model for entrepreneur- ship in entrepreneur's family or surround- ing 1, otherwise 0	414	-	0	1
	partner	The number of partners within the estab- lished firm	414	1,24	1	4
	export	If the firm export 1, otherwise 0	414	-	0	1
5	Inempini	initial firm size (logarithmic scale)	392	1,31	0	5,70
THE FIRN	onlyloan	If firm's founding capital is completely loan 1, otherwise 0	414	-	0	1
TURES OF .	networking	If entrepreneur is in cooperation with stakeholders within and outside the incubator 1, otherwise 0	414	-	0	1
FEA	innova	If entrepreneur has made innovation 1, otherwise 0	414	-	0	1
	advert	If the firm has had an advertising 1, oth- erwise 0	414		0	1
	brand	If the firm is a brand owner 1, otherwise 0	414	-	0	1

	IES		If entrepreneur has used at least one of				
	ERT	comserv	the common services offered by incuba-	414	-	0	1
NOI	ROP		tion 1, otherwise 0				
BAT	UD P		If the incubated firm entered the incuba-				
NCU	SAN	whenest	tion center within first 3 years (36 months)	414	-	0	1
=	/ICE		of incubation center 1, otherwise 0				
	SER	incubsize	The number of incubation's workshop	414	43,14	14	84
AL ES	coctor	If the firm is in the manufacturing indus-	411		0	1	
STRI	RTI	sector	try 1, in the service sector 0	411	-	0	1
DUS	OPE	comnete	Intensity of competition in the sector (1-5		_	1	5
Ξ	PR	compete	Likert scale)	410		1	5
			(%) Share of the GDP per capita of the				
NAL	RES	prorank	province in the Country GDP where the	414	1,51	0,59	2,07
TERI	ATU		incubation center is located				
.XE	FE/	cycle	If the firm has experienced an economic	A1A	_	0	1
		cycle	crisis 1, otherwise 0	414		0	1

Source: Karaöz M. and Albeni M.," The Factors Affecting Survival and Growth Performance of Newly Established Enterprises in Business Incubators: A Survey on the KOSGEB Business Development Centers (İŞGEM)", TÜBİTAK Project No: 109K139, Isparta, March 2011.

(exit) variable is used as dependent variable. It takes the value of 1 if the firm is closed within the period in incubation or after the firm has graduated from incubation, the value of 0 in other cases. In addition to (exit), exit time (incubage) is the other main variable in our survival analysis. As seen at Table 3.1, for our dataset, the firms' average life expectancy is 41.52 months. The maximum survival time observed as 158 months. Some of the firms failed either during or some time after leaving the incubator. Yet some of the firms still continue their activity either at incubator or outside the incubator. Survival curve of firms has been presented at Figure 3.1. According to the figure, surivors after 158 months diminish to about 20%.



#### Figure 1. The survival curve of firms which is present or graduate from incubation (month)

#### Results

All Cox Regression results with and without considering time effects are presented in Table 3.2. (gender), (lnentage), (family), (export), (lnempini), (advert), (brand), (comserv), (sector), (compete) and (cycle) variables are insignificant in Model 1, which the time-dependent effects have not taken into account. According to Model 1 estimates, entrepreneur's gender, age, whether s/he is affected family environment; initial firm size, whether the firm exports and does advertising, whether the firm is brand owner; whether the firm takes advantage of common services offered by incubators; the sector in which the firm, intensity of competition in the sector and whether the firm experienced any macroeconomic crisis are not significant on the firms' survival times. Our tests indicate that further estimations are necessary using time-dependent variables. Thus we produce further new estimates and present most relevant two model results at Table 3.2.

Model 2 includes the variables which in Model 1 and all of the interaction terms created by each of these variables multiplying , which is a function of time, in order to handle variable-time interaction. The Model 3 are obtained by removing the interaction terms of (**Inempini**), (**innova**), (**enteduuni**), (**whenest**), (**export**), (**brand**), (**gender**), (**sector**), (**advert**), (**networking**), (**entexp**), (**income**), (**onlyloan**), (**partner**), (**family**), (**Inentage**), (**comserv**), (**compete**) and (**cycle**) variables from the model. Model 3 is the best model that takes into account time-dependent effects. The variables of (**incubsize**) and (**prorank**) are found to be the time-dependent variables.

#### Table 2. The estimates of the basic model and Cox model with time-dependent variables

Variable	income	gender	Inentage	enteduuni	entexp	family	partner	export	Inempini
Model 1	1.18	-0.056	0.265	0.659	-0.084	-0.307	-1.71	0.827	0.214
	0.010***	0.892	0.732	0.044**	0.042**	0.402	0.015**	0.308	0.278
Model 2	5.16	1.14	6.45	0.289	-0.307	-4.63	1.07	6.47	0.274
Widdel 2	0.253	0.745	0.422	0.924	0.342	0.205	0.844	0.576	0.847
Model 2	1.75	-0.093	0.721	0.762	-0.101	-0.249	-2.39	0.951	0.196
WIDDEI S	0.000***	0.826	0.364	0.024**	0.013**	0.518	0.001***	0.303	0.298
	income	gender	Inentage	enteduuni	entexp	family	partner	export	Inempini
Model 2 (cont.)	-0.959	-0.352	-1.48	0.139	0.055	1.23	-1.08	-1.25	-0.023
	0.427	0.699	0.474	0.861	0.505	0.212	0.457	0.678	0.954
Model 3	-	-	-	-	-	-	-	-	
(cont.)	-	-	-	-	-	-	-	-	-

onlyloan	networking	innova	advert	brand	comserv	whenest	incubsize	sector	compete	prorank	cycle
-1.03	-1.47	-1.67	0.636	0.865	0.264	-1.18	-0.02	-0.156	-0.157	-1.16	0.46
0.063*	0.004***	0.006***	* 0.17	0.275	0.592	0.013**	0.002***	0.738	0.416	0.013**	0.21
-6.97	4.45	-2.24	-2.74	-4.22	-6.63	-0.985	-0.261	-4.39	2.92	19.4	10.5
0.215	0.333	0.74	0.522	0.685	0.217	0.813	0.015**	0.291	0.23	0.003***	°0.085*
-1.88	-1.54	-2.46	0.615	1.61	0.638	-2.25	-0.253	-0.425	-0.341	16.9	0.791
0.002***	0.004***	0.001***	* 0.198	0.074*	0.234	0.000***	<sup>•</sup> 0.009***	0.362	0.099*	0.002***	°0.040**
onlyloan	networking	innova	advert	brand	comserv	whenest	incubsize	sector	compete	prorank	cycle
1.3	-1.7	-0.147	0.924	1.48	1.99	-0.415	0.059	1.03	-0.903	-5.74	-2.5
0.378	0.177	0.937	0.418	0.582	0.161	0.718	0.030**	0.344	0.17	0.001***	60.108
-	-	-	-	-	-	-	0.058	-	-	-5	-
-		-	-	-	-	-	0.017**	-	-	0.001***	· -

\*, \*\*, and \*\*\* indicate significance at the 1, 5, and 10% levels, respectively.

Log-likelihood and prob values of Model 1, 2 and 3, respectively, are -190.632 [0.000\*\*\*], -165.552 [0.000\*\*\*] and -173.255 [0.000\*\*\*].

Also considering the Model 2 and 3, we obtain various results regarding the variables. The possibility of failure of the firms, whose owners only dependent on earnings coming from its new-born firm, is about 6 times higher than other firms. In this case it has been seen that the entrepreneurs having income from other sources are more likely to be successful in start-up business. It is interesting to see the result that the firms whose owners are university graduates have about two times higher risk of failure than other firms. Yet there is a plausible explanation. Most of the incubator residents are specialized in low-technology industries, which have higher likelihood of failure. University graduates, who later realized that the new business has not much prospect, close the firm immediately and return looking for a job related to his carreer. University graduates have higher chance of finding a better paying job than non-university graduates. By the same token, non-university graduates seem to strive more to keep the new business alive. An increase in the number of partners in the firm decreases the possibility of failure of firms to 20%. It is interesting to see that failure risk of firms, whose founding capital is formed entirely by loans, is only about %15 of the other firms, whose initial capital is partially or fully self-financed. If an entrepreneur is in collaboration with stakeholders within and outside the incubation, survival probability of the firm becomes approximately 5-times higher. Moreover, it has been seen from the estimates that innovation activity of new firms increases chance of survival approximately 12-times. Brand ownership also increases the chance of the firm's survival. Establishing a firm within an incubation center that is within its first 3-years (36 months) increases survival probability. Finally, firms those experiences a macroeconomic crisis have nearly two times more likelihood of failure than others.

#### Conclusions

Cox proportional hazard model, besides others, rest on proportional hazards assumption that independent variables do not vary with time. When PH assumption is violated, Cox regression estimates become biased. Then, Cox survival estimates can be corrected by including the time-varying effects to the analysis. Identification and calculation of time-dependent effects give the opportunity to obtain some otherwise unseen valuable special time pattern information.

In our analysis, initially, the Cox regression was performed by considering that all explanatory variables are constant over time. Then, extended Cox regression models

were estimated by including the time-dependent explanatory variables in the model. Our extended model results have shown that it become useful to estimate the Cox Proportional Hazards regression by also including the time-varying explanatory variables to the analysis. Both the time-independent and time-dependent variables create significant effects on the probability of survival of the *İŞGEM* firms.

Overall, our estimates suggest that entrepreneurial experience acquired before starting business at *İŞGEM*, higher number of partners in the firm, formation of the firm's capital completely by loan, being in collaboration with stakeholders within and outside the incubator, innovative activities in the firm, starting the new business within first 36 months of an incubator (in a young incubator), higher number of office spaces, establishing the firm in an economically larger province, and the density of competition in the sector have positive impact on the probability of survival of the new-born firms within the incubator. Entrepreneurs whose only source of income comes from the young firm, who has college diploma, who has brand ownership at the firm, who experience a macroeconomic crisis are more likely to fail.

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# Unit Root Properties of Energy Consumption and Production in Turkey

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#### ABSTRACT

This study analyzes unit root properties of total and sectorial energy production and consumption series of Turkey. This study is the first to analyze unit root properties of Turkish energy production and consumption in detail. The unit root analysis of energy production and consumption are tested by using unit root tests based on LM considering without structural break and with one and two structural breaks. According to unit root test without structural break, the unit root hypothesis is rejected only for consumption of natural gas. The unit root hypothesis is rejected for 15 out of the 33 series by the LS test with one structural break. When unit root test with two structural breaks are conducted, 25 out of the 33 series are found to be stationary around a deterministic trend. The production of hydraulic and the consumption of lignite, electricity, petroleum, coal and electricity, total energy and petroleum consumption in Transportation sector are found to be nonstationary, which indicates that the impacts of innovations on these variables will be permanent. The policy implication of the results suggests that the impacts of shocks on energy consumption and production will be temporary and not have a long memory for most of variables.

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#### KEYWORDS

Energy Consumption, Energy Production, Unit Root Analysis, Turkey

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#### Introduction

The impact of unit root properties of energy variables for the formulation and consequences of economic policies are crucial in several aspects, especially on structural transitions from shocks in energy markets towards key macroeconomic variables (Mishra, Sharma, & Smyth, 2009; Narayan & Smyth, 2007). Impact of shocks on energy variable can be permanent or transitory according to its unit root properties. If the energy variable is stationary, impact of shocks will be transitory and long short term. On the other hand, if the energy variable is not stationary, the impacts of shocks will be permanent and have a long memory. Hendry and Juselius (2000) indicate that economic variables can inherit unit root properties from related economic variables and can in turn transmit this property to other related variables. They argued that relationship between economic variables can spread unit root properties throughout the economy. In this context, knowledge of unit root properties of an energy variable is of importance, since this property can be inherited by related macroeconomic variables. The impact of energy demand on economic activity can be serious. The literature has shown that energy price shocks, via their substantial impact on energy consumption, have significant impacts on output (Chang & Wong, 2003; Du, Yanan, & Wei, 2010; Hamilton, 1996, 2007; Huang, Hwang, & Peng, 2005; Jayaraman & Choong, 2009; Jiménez-Rodríguez, 2008; Lardic & Mignon, 2008; B. R. Lee, Lee, & Ratti, 2001; Lorde, Jackman, & Thomas, 2009; Zhang, 2011), inflation (Chang & Wong, 2003; Cologni & Manera, 2008; Cuñado & Pérez de Gracia, 2003; Ewing & Thompson, 2007), unemployment (Carruth, Hooker, & Oswald, 1998; Chang & Wong, 2003; Rafiq, Salim, & Bloch, 2009), employment (Papapetrou, 2001), stock market (Arouri, Lahiani, & Nguyen, 2011; Basher, Haug, & Sadorsky, 2012; Evangelia, 2001; Filis, Degiannakis, & Floros, 2011; Park & Ratti, 2008; Sadorsky, 1999), investment (Rafiq et al., 2009), the budget deficit (Rafiq et al., 2009), exchange rate (Ayadi, 2005; Basher et al., 2012; S. S. Chen & Chen, 2007; Narayan, Narayan, & Prasad, 2008; Özturk, Feridun, & Kalyoncu, 2008), interest rate (Lowinger, Wihlborg, & Willman, 1985; Park & Ratti, 2008), exports (Chiou Wei & Zhu, 2002; Faria, Mollick, Albuquerque, & León-Ledesma, 2009; Zhang, 2011), fluctuations in business cycle (Kim & Loungani, 1992) and money supply (Zhang, 2011).

Besides shocks on energy demand, Hamilton (2007) showed that disruptions on energy supply can also have significant impact on economic activity by presenting a model based on Cobb-Douglas production function as below:

$$Y = F(L, K, E) \tag{1}$$

where output (Y) is production, (L) is labour, (K) is capital and (E) is energy use of a firm. The profits ( $\pi$ ) of a firm can be estimated as:

$$\pi = PY - WL - rK - QE \tag{2}$$

where P is the price of output per unit, W is the nominal wage paid for labour, Q is the nominal cost of energy used in the production process and r is the nominal rate of rented capital. The equilibrium energy price for rational firm will be at a level where marginal product of energy is equal to unit price of energy:

$$F_E(L,K,E) = Q/P \tag{3}$$

where  $F_E(L,K,E)$  is the partial derivative of F(.) regarding E. The following equation will be obtained in case both sides of the equation (3) are multiplied by E and divided by Y:

$$\partial \ln F / \partial \ln E = QE / PY \tag{4}$$

Eq (4) indicates that the elasticity of output regarding change in energy consumption used in the production process can be derived from the cost of the energy used to produce the total output. Disruptions in energy production will affect energy prices and a change in energy prices used in production process will also have a significant impact on output of an economy as shown in Eq (4). Therefore, shocks on non-stationary energy production series will be permanent and affect economic activity perpetually , while shocks on stationary energy production series will be transitory and affect economic activity temporarily, via transmission mechanism (Narayan, Narayan, & Smyth, 2008).

The unit root properties of energy variables are of importance for forecasting these variables. Accurate forecasts are crucial for energy planning and policy formulation. Future values of a stationary energy variable can be forecasted based on its past behavior (P. F. Chen & Lee, 2007), while past data about a nonstationary energy variable are useless in forecasting (Mishra et al., 2009).

Stationarity of energy consumption can be due to a multitude of factors. Hsu, Lee, and Lee (2008) suggested that abundance of energy resources, less energy consumption, new environmental regulations and laws introduced by governments and middle income level may lead to stationarity of energy consumption.
The goal of this study is to analyze the unit root properties of energy consumption and production in Turkey by employing a Lagrange Multiplier based unit root test without structural break proposed by Schmidt and Phillips (1992) (SP) and a unit root test considering one structural break proposed by J. Lee and Strazicich (2004) (LS) and two structural breaks developed by J. Lee and Strazicich (2003) (LS). If the time series of the variable to be tested for the unit root properties has structural breaks, the unit root hypothesis cannot be rejected by conventional unit root tests (Perron, 1989). Monte Carlo simulations point that statistical performance of LS is better than other alternatives (Narayan, Narayan, & Popp, 2010). This study is the first to investigate unit root properties of Turkish energy production and consumption in detail. The next section briefly summarizes the literature on studies analyzing the unit root properties of energy consumption and production. Section 3 describes data used in the analysis. Section 4 summarizes the unit root tests used in this study. Section 5 presents results of the unit root test. Section 6 discusses main findings and implications of the results for policy formulation and implementation.

# Brief Overview of the Literature

Although there have been numerous studies analyzing the unit root properties of energy consumption series, only a handful of studies have investigated energy production. Barros, Gil-Alana, and Payne (2011) examine the time series behavior of oil production for 13 OPEC member countries for the period of January 1973 and October 2008. They found that oil production series have mean reverting persistence with breaks identified in 10 out of the 13 countries. The results of the study indicate that the impact of shocks on oil production in these countries will be persistent in the long run for all countries.

Narayan, Narayan, and Smyth (2008) analyze the unit root properties of crude oil production for 60 countries by conducting panel data unit root tests with and without structural breaks between 1971 and 2003. The results of tests without a structural break are inconclusive, while the results of test with a structural break are conclusive and indicate the stationary structure of production series of crude oil and natural gas liquids.

Maslyuk and Smyth (2009) test for non-linarities and unit roots in crude oil production. They used monthly crude oil production for 17 OPEC and non-OPEC

countries between January 1973 and December 2007. The results of their study show the presence of threshold effects on the crude oil production and unit root for 11 of the countries in both regimes and a partial unit root for the others.

In contrast to the dearth of studies investigating unit root properties of energy production series, there are numerous studies on unit root properties of energy consumption. Narayan and Smyth (2007) analyze the stationarity properties of per capita energy consumption of 182 countries for the period of 1979 to 2000 by using annual data. The results of univariate unit root test indicate that the series of 56 countries are nonstationary at the 10% level or better. The panel data unit root test indicate that there is overwhelming evidence about stationary of energy consumption.

P. F. Chen and Lee (2007) investigate energy consumption per capita series of 7 regional panel sets for the period of 1971 to 2002 by employing panel unit root testing procedure, and find stationary structure in all series. A substantial literature review about the unit root properties of energy consumption can be found in P. F. Chen and Lee (2007), Hsu et al. (2008) and Aslan and Kum (2011).

# Data

The unit root properties of primary total production, total and sectorial consumption of various energy variables of Turkey covering different periods are explored in this study as shown in Table 1. The data are obtained from Ministry of Energy and Natural Resources (MENR) of Turkey. The periods of analysis are determined by data availability. All data used in this study are transformed to natural logarithmic form prior to unit root tests. Descriptive statistics of the variables subject to analysis are presented in Table 1.

#### Table 1. Descriptive Statistics

Series Code	Series Name	Period	Unit	Mean	Std. Dev.
		Production			
PCL	Coal	1950 - 2008	TEP	2097	623
PLT	Lignite	1950 - 2008	TEP	5498	4569
PPM	Petroleum	1950 - 2008	TEP	2325	1325
PNG	Natural Gas	1976 - 2008	TEP	293	284
РНС	Hydraulic	1950 - 2008	TEP	1322	1329
PGL	Geothermal	1963 - 2008	TEP	318	309
PWD	Wood	1950 - 2008	TEP	4405	764
PEY	Electricity	1923 - 2009	10 <sup>6</sup> kWh	34695	53778
	<u>C</u>	onsumption			
CCL	Coal	1970 - 2009	TEP	6411	3942
CLT	Lignite	1970 - 2009	TEP	8084	4061
СРМ	Petroleum	1970 - 2009	TEP	23066	7786
CNG	Natural Gas	1976 - 2009	TEP	9089	10980
СНС	Hydraulic	1970 - 2009	TEP	1971	1215
CGL	Geothermal	1970 - 2009	TEP	354	296
CWD	Wood	1970 - 2009	TEP	4776	615
CEY	Electricity	1923 - 2009	10 <sup>6</sup> kWh	28122	43089
	<u>Sector</u>	ial Consumption			
IND	Industrial	1970 - 2009	TEP	15218	8461
IND_PET	Industrial (Petroleum)	1970 - 2009	TEP	4699	1810
IND_ECT	Industrial (Electricity)	1970 - 2009	TEP	2630	1773
IND_NGS	Industrial (Natural gas)	1976 - 2009	TEP	2508	2680
ТРТ	Transportation	1970 - 2009	TEP	8869	3826
TPT_PET	Transportation (Petroleum)	1970 - 2009	TEP	8637	3976
TPT_ECT	Transportation (Electricity)	1970 - 2009	TEP	36	22
RES	Residential	1970 - 2009	TEP	16368	4926
RES_PET	Residential (Petroleum)	1970 - 2009	TEP	3346	2428
RES_ECT	Residential (Electricity)	1970 - 2009	TEP	2252	2079
ACL	Agricultural	1970 - 2009	TEP	2083	1208
ACL_PET	Agricultural (Petroleum)	1970 - 2009	TEP	1927	1058
ACL_ECT	Agricultural (Electricity)	1970 - 2009	TEP	129	149
OSC	Other sectors	1970 - 2009	TEP	18450	6117
OSC_PET	Other sectors (Petroleum)	1970 - 2009	TEP	4700	1670
OSC_ECT	Other sectors (Electricity)	1970 - 2009	TEP	2381	2227
NEY	Non-energy	1970 - 2009	TEP	1471	1152

Note: TEP indicates Ton Equivalent Petroleum

Time series plot for the production of energy variables of Turkey are shown in Figure 1. Decrease in petroleum, coal and wood production series are remarkable in com-

parison to other series in recent years. The decrease in wood production for energy usage indicates substitution for this resource with other energy resources such as natural gas. Trends for other series increase with some fluctuations over the periods analyzed and display steep increase thereafter. However, electricity and geothermal production series have no serious fluctuation indicating successful production policies on these energy variables and these production process variables' structural strength towards disruptive shocks.

Figure 1. Energy Production (Source: MENR)





Time series plot for consumption of energy variables of Turkey are shown in Figure 2. Only consumption of geothermal and wood series for energy usage significantly decrease among all energy variables. The decrease in wood consumption is consistent with its decrease in production, owing to alternative energy resources such as natural gas production. The increase in consumption of electricity, natural gas and petroleum are remarkable compared to other variables, and indicate the importance of these energy resources for economy in Turkey. Although the price of natural gas in Turkey is the highest in the world (Altunsoy, 2008), the remarkable increase in its consumption indicates it is still cheaper than other energy resources in Turkey.

#### Figure 2. Energy Consumption (Source: MENR)





Time series plot for sectorial consumption of energy variables of Turkey are shown in Figure 3. The increase in energy consumption in industry indicates how the importance of industry has increased in the economy. At the end of 1990s, use of petroleum decrease significantly in industry. When compared to other energy resources, the significant increase in natural gas consumption in industry indicates a substitution between energy resources because of increasing oil prices and energy

2000

policies promoting natural gas consumption. Total energy consumption in every sector increased with a positive trend indicating the rapid growth in the Turkish economy in the last decade. Structural breaks are clear in 1994, 1999, 2001 and 2008 when economic crises occurred.

## Figure 3. Sectorial Energy Consumption (Source: MENR)





Industrial Electricity





Total Transportation







2010

2000

Other se 25000 nption -20000 2000 2010 1990 Years

1980

1990 Years

1970



#### **Econometric Methodology**

The LS unit root test is based on Lagrangian Multiplier (LM) for trending data. J. Lee and Strazicich (2003, 2004) extended Schmidt and Phillips (1992) methodology by considering structural breaks. The form of the test allows endogenous determination of two structural breaks under both the null and alternative hypotheses for a change in both the level and trend.

 $\begin{array}{l} \Delta Y_t = \delta' \Delta Z_t + \varphi \tilde{S}_{t-1} + \varepsilon_t, \\ (5) \end{array}$ 

where  $Z_t = [1, t, D_{1t}, D_{2t}, DT_{1t}, DT_{2t}]$  is a vector of exogenous variables,  $\delta = [\mu, \gamma, d_1, d_2, d_3, d_4]$  is a parameter vector of  $Z_t$  and the subsequent dummies, which allow two time changes in the level and trend, are as follows:

$$D_{jt} = \begin{cases} 1 & t \ge T_{Bj} + 1 \\ 0 & t < T_{Bj} + 1 \end{cases} \text{ and } DT_{jt} = \begin{cases} t - T_{Bj} & t \ge T_{Bj} + 1 \\ 0 & t < T_{Bj} + 1 \end{cases}, \quad j = 1, 2$$

 $\tilde{\psi}_x = Y_1 - Z_1 \tilde{\delta}$  and  $\tilde{S}_t = Y_t - \tilde{\psi}_x - Z_t \tilde{\delta}$  where  $\tilde{\delta}$  are coefficients in the regression of  $\Delta Y_t$  on  $\Delta Z_t$ . The null and alternative hypotheses are:

$$H_0: \beta - 1 = \varphi = 0 \text{ vs } H_1: \beta - 1 = \varphi < 0 \tag{7}$$

To determine the location of the breaks  $(\lambda = (\lambda_1 = T_{B1} / T, \lambda_2 = T_{B2} / T))$  LS procedure utilizes a grid search as follows:

$$LM_{\tau} = \inf \tilde{\tau}_{\lambda}(\lambda) \tag{8}$$

Break points are where the corresponding test statistic is minimal.

#### Results

The results of the unit root tests with one and two structural breaks and without structural break are presented in Table 2. Three distinct unit root tests are used in this study to distinguish the impacts of structural break(s) on the energy series. We considered breaks at level and trend of the series. The number of lags is determined according to the general to specific method up to specific number of maximum lag<sup>1</sup> running by t-statistics significance at the 10% significance level.

The unit root hypothesis is rejected only for consumption of natural gas by conventional unit root tests without structural break. The LS unit root test with one structural break rejected the unit root hypothesis for 15 out of the 33 series. When two structural breaks are taken into account, 25 out of the 33 series are found stationary. This series is stationary around deterministic trend with breaks. The production of hydraulic and the consumption of lignite, electricity, petroleum, and coal, total energy consumption in the transportation sector and consumption of petroleum in the transportation sector are found to be non-stationary. According to the results, structural breaks in energy variables of Turkey should be taken into consideration when the unit root properties are examined. If the time series of the variable with structural breaks are tested by conventional unit root tests, the unit root hypothesis may be not cannot rejected (Perron, 1989). Our results verify the theory that the number of rejection of unit root null hypothesis declines when the number of structural breaks is increased.

<sup>1</sup> The number of maximum lag depends on number of observation of the series.

#### Table 2. Results of unit root tests

Sorios	SP		LS -	one break		LS - 1	two breaks		
Series	k	t statistics	k	t statistics	ТВ	k	t statistics	TB1	TB2
PHC	0	-1.52	6	-3.87	1999	6	-5.04	1983	1993
PGL	0	-2.12	3	-3.58	2006	9	-8.71a	1987	2006
PLT	2	-1.45	2	-3.44	1991	3	-6.35a	1987	2001
PWD	8	-0.73	9	-4.20c	1990	6	-5.79b	1984	1996
PPM	8	1.83	7	-3.37	1988	7	-5.40c	1988	1994
PCL	0	-1.99	9	-4.73b	1994	8	-6.46a	1988	1994
PNG	8	-2.16	8	-6.65a	1994	2	-16.39a	1988	2003
PEY	9	-0.45	9	-3.68	1987	9	-4.51	1944	1973
CHC	0	0.14	0	-2.33	1966	7	-5.39b	1968	1993
CGL	3	-1.94	2	-5.74a	1989	2	-6.88a	1975	1987
CLT	9	-1.93	9	-3.87	1998	9	-4.62	1979	1999
CWD	2	-0.53	5	-4.26c	1989	10	-6.18b	1972	1990
CPM	6	-0.93	10	-4.30c	1991	6	-4.65	1965	2002
CCL	9	-1.80	10	-2.94	1989	5	-5.06	1975	1993
CNG	8	-3.13c	5	-5.76a	1987	2	-9.17a	1988	1990
CEY	11	-0.08	11	-4.68b	1981	11	-4.87	1981	1989
IND	0	-2.22	5	-5.03b	2000	5	-5.69b	1991	2000
IND_PET	5	-1.72	9	-4.14	2003	9	-6.41a	1989	1994
IND_ECT	6	1.45	0	-3.98	1985	5	-5.97b	1984	2000
IND_NGS	0	-1.53	4	-3.19	1993	6	-8.61a	1994	1999
TPT	0	-1.68	0	-4.11	1997	8	-4.68	1987	1991
TPT_PET	0	-2.56	3	-4.25c	1997	8	-5.15	1987	1991
TPT_ECT	5	-2.07	9	-3.95	2002	6	-6.99a	1986	2002
OSC	0	-1.40	0	-2.53	2001	6	-8.54a	1982	1999
OSC_PET	0	-1.15	1	-4.78b	2000	2	-7.47a	1996	2000
OSC_ECT	0	-0.98	9	-3.94	1985	9	-6.40a	1982	1995
RES	0	-1.46	0	-2.42	2001	6	-8.44a	1982	1999
RES_PET	0	-1.07	9	-4.97b	1993	9	-11.48a	1987	1993
RES_ECT	0	-1.11	9	-3.95	1985	9	-7.02a	1982	1995
ACL	0	-1.64	4	-3.61	1995	7	-6.82a	1993	2006
ACL_PET	7	-2.73	7	-4.48c	1994	7	-5.39c	1993	1999
ACL_ECT	8	-1.94	8	-4.95b	1992	9	-5.64b	1994	2006
NEY	1	-3.74a	2	-5.01b	2003	3	-6.60a	1997	2003

*Notes: k* indicates the number of lags. a, b and c denote significance at the 1% 5% and 10% level, respectively. TB denotes time breaks.

## Conclusion

Specification of unit root properties of energy consumption and production is crucial for energy policy formulations and implementations. The impact of shocks on energy variables with a stationary process will be temporary and long short term, while impact of shocks on energy variables with a nonstationary process will be permanent and have a long memory.

In this study, the unit root properties of total and sectorial energy production and consumption series of Turkey are investigated. This study is the first to investigate unit root properties of Turkish energy production and consumption in detail. The unit root structure for energy variables are tested by using the unit root tests based on LM without structural break and with one and two structural breaks. The results of unit root test without structural break show that the unit root hypothesis is rejected only for consumption of natural gas. In the case of one structural break, the unit root hypothesis is rejected for 15 out of the 33 series by LS test. When two structural breaks are taken into account, 25 out of the 33 series are found to be stationary around a deterministic trend with breaks. The production of hydraulic, the consumption of lignite, electricity, petroleum, coal, electricity, total energy consumption and petroleum consumption in the transportation sector are found to be non-stationary, which indicates that the impact of innovations on these variables will be permanent.

The policy implication of these results suggests that the impacts of shocks on energy consumption and production will be temporary and not have a long memory for most of the variables. Therefore, the economic impact of energy stabilization and conservation policies will be temporary in Turkey. The results of this study, which found that most of the variables are stationary, are consistent the consensus about stationarity of energy variables found in numerous other studies (Narayan et al., 2010). In addition, the historical data on these stationary variables can be taken into account to forecast the future values of these variables.

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# Measuring and Reporting Cost of Quality in a Turkish Manufacturing Company: A Case Study in Electric Industry

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#### ABSTRACT

Contemporarily, the competition in the markets has thoroughly heated KEYWORDS up. Many companies try to decrease their costs in order to survive in Total Quality Management, this cruel market. In this respects, the quality costs gain importance in Quality Costs, Managerial all over the world and in Turkey, too. In this study, the implementation Accounting. of quality costs measuring and reporting system has been performed in a company. Accordingly, the data has been collected from a Turkish manufacturing company. The data gathered from this company's accounting department has been used for studying on quality costs measuring and reporting system. Consequently, it is found out that the company cannot measure its quality costs adequately, for this reason quality reporting system in the company is not efficient. The company needs to give more significance to the quality costs measuring and reporting.

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# Introduction

In recent years, competitive environment of companies has been getting harder and harder. In order to have sustainable competitive advantage, companies should produce their products to entirely supply customers' needs, wants and demands. Subsequently, companies need to have more quality products to remain competitive with other companies.

To gain a competitive advantage over rival companies, a company should produce high quality products. While producing high quality product, the company should also take into account its quality costs. Shortly, companies need to produce high quality products in a low quality costs. As a result, quality and quality costs gain vital importance for a company to survive in a highly competitive market.

The significance of this study is to comprehend the necessity of the quality system for a company which operates in the global and local markets. Another gist of the study is to provide recognition of quality costs system benefit to the profit and brand name. The quality costs system causes decreasing in the production cost and increasing in the brand name which will be perceived as producing qualified products.

The aims of this study are to show the importance of the quality costs for a company which competes in a highly competitive market, and also demonstrate the necessity of quality costs system so as to have high qualified product with a low quality costs. As it is well known, the quality cost is not the responsibility of a department or an individual, on the contrary, every person in an organization should be responsible for quality. Highly qualified products can be reached by the collaboration of all departments in an organization. In this sense, the main aim of this study is to demonstrate the function of accounting department in quality costs, the classification of this costs and the reporting techniques of the quality costs. In this respect, the purpose of the current study is to show the importance of quality costs' reporting.

The paper contributes to the literature by documenting the concepts of quality, quality costs, and the classification of quality costs and quality costs measurement. On the basis of literature review, a case study will be handled and lastly, the analysis and results will be given in last section.

# Literature review

To be able to analyze the measuring and reporting costs of quality, some concepts should be clear first. The three basic concepts of this paper will be introduced. These concepts are quality and quality costs, classification of quality costs and lastly, quality costs measurement.

The concept of quality has been defined for many quality gurus. So, there are many definitions for quality. Quality is the features of products which meet customer needs and thereby provide customer satisfaction. Quality means freedom from deficiencies (Juran & Godfrey, 1998). According to D. C. Montgomery, Quality means fitness for use, and also he defined quality as inversely proportional to variability (Montgomery, 2005).

In addition to those definitions, some of other quality gurus defined quality as;

- Crosby (1979, p. 7) defines quality as "conformance to requirements"
- Feigenbaum's (1983, p. 7) definition of quality is "the total composite product and service characteristics of marketing, engineering, manufacture and maintenance through which the product and service in use will meet the expectations of the customer."
- As Ishikawa (1985, p. 45) suggests, quality means "quality of work, quality of service, quality of information, quality of process, quality of division, quality of people, including workers, engineers, managers and executives, quality of system, quality of company, quality of objectives, etc."
- Pirsig's definition (1984,p. 206) of quality is that "Quality is a characteristic of thought and statement that is recognized by a nonthinking process. Because definitions are a product of rigid, formal thinking, quality cannot be defined."

To sum up those definitions, quality is the whole good and service characteristic features of fulfillment power for stated and demanded needs. In other words, many quality gurus defined quality in terms of the degree of the product's conformance to its requirements to maintain customer satisfaction and in terms of a product that contains no defects (Ömürgönülşen, 2009).

*Quality Cost* is a cost for detection and anchoring of low quality about goods and services. Simply, costs of quality are the costs which occur because poor quality may or does exist (Hansen & Mowen, 2006). Quality costs are a measurement of the costs particularly related with the accomplishment or non-accomplishment of

product or service quality. To make those explanations more specific, Jack Campanella(1999, p. 4) defined cost of quality as;

"More specifically, quality costs are the sum of the cost incurred by (a) investing in the prevention of non-conformances to requirements, (b) appraising a product or service for conformance to requirements, and (c) failing to meet requirements."

In the definitions of Campanella, it is understood that the quality costs consist of three main parts; Prevention Costs, Appraisal Costs, Failure Costs.

The required quality activities would incur costs and quality costs arecategorized into three main parts – Prevention, Appraisal and Failure Costs – Those can be also stated as PAF (**P**revention-**A**ppraisal-**F**ailure) model (Jaju & Lakhe, 2009). Failure costs should be taken into consideration as two subtopics which are called internal and external failure costs.

Figure 1. Classification of Quality Costs (Rodchua, 2006)



In Figure 1, three main classifications of quality activities costs have been shown. Those costs do not occur at the same period of the production process. So, it should be also classified as time periods in which they occurred.

*Prevention Costs* are the preliminary activities' costs to reach quality goals for producing goods and services and avoid deviations of those goals (Kırlıoğlu, 1998). Prevention costs are occurred to prevent low quality in the goods or services being produced (Hansen & Mowen, 2006). Prevention costs are related with quality planning, designing, implementing and managing the quality system, auditing the system, supplier surveys, and process improvements (Rodchua, 2006).

*Appraisal Costs* are activity costs of measuring the suitability of the product to customers' needs. It is incurred to identify non-conformance to requirements (Oliver & Qu, 1999). Those costs are related with the supplier's and customer's assessment of

purchased materials, processes, intermediates, products and services to assure conformance with the specified requirements (Tsai, 1998).

*Internal Failure Costs* are the costs of low quality product which are realized before sales of the product. In other words, these costs arise when the outcomes of production fail to meet stated quality specifications and are noticed before transfer of those low quality products to the customers (Vahevanidis et al., 2009).

*External Failure Costs* are failure costs which come up after delivering the products to the customers(Kaner, 1996). Those costs take place for the reason that the products and services do not conform to specification or requirements and those products do not satisfy customer needs after being delivered to customers (Hansen & Mowen, 2006). It is also incurred by amending failures after transferring the finished goods and products to the customers (Low & Yeo, 1998).

Additionally, Quality cost classification can be grouped in time periods. For example, prevention costs encompass the stage of both pre-production and during production and appraisal costs cover the three stages of production –preproduction, production and after production stage. Failure costs are divided into two subtopics which internal failure costs and external failure costs. Internal failure costs encompass the period of both production and after production stages. External failure costs just related with the stage of after sale (Barfield et al., 2002).

Figure 2. Time-Phased Model for Quality Costs(Barfield et al., 2002)



The Quality Costs Measuring helps to find out where unnecessary quality costs are occurred, thus management can take actions to eliminate that kind of costs and this

elimination will reduce the occurrence of poor quality costs. In other saying, the quality costs measurement serves management to determine which area of operation requires preventive measures (Low & Yeo, 1998).

To measure quality costs, one should collect related data from quality activities of a company. After the collection of data which are related with quality costs components, they should be analyzed before using in an action. This analysis consists of the relationship between a costs component and other costs components and searches the effect on total costs.

Quality costs are analyzed in weekly, monthly, quarterly, yearly, etc. periods. Company structure should be taken into account in determining the period of analysis (Şimşek, 2001). In order to analyze quality costs, companies need to use some techniques. The analysis techniques for quality costs can be listed as;

- I. Pareto Analysis,
- II. Ratio Analysis,
- III. Correlation Analysis,
- IV. Trend Analysis,
- V. Regression Analysis.

*Pareto Analysis* is one of the most used techniques in quality costs analysis. This technique was developed by Wilfredo Pareto who is a nineteenth century Italian social scientist and economist. He gave his surname to the technique. Pareto principle is universally known as the 80/20 rule. Pareto found out this principle by pinning down that 80 percent of Italy's national income is shared by 20 percent of the Italy's populations. With the help of Pareto diagrams, problems can be put in order of importance, problems of costs analysis can be easily performed and relative occurrence numbers could be searched simply (Sarıkaya, 2003). In other words, Pareto analysis can be utilized to recognize cost drivers which are accountable for the most of cost occurred by ranking the cost drivers in order of value (Tsai, 1998).

*The Technique of Ratio Analysis* is aimed to identify the aspects of the quality costs' performance to aid decision making. Ratio analysis consist of rationing quality costs to revenue, production costs, direct labor costs and rationing total quality costs within themselves (Özcan, 2012).

*Correlation analysis* represents the direction and the power of the relationship between variables. In correlation analysis, the results do not give cause-effect relationship, because there is no dependent and independent variable in this technique (Altunişik et al., 2005).

*Trend Analysis* a useful picture of how the quality improvement program has been doing since its inception. It provides management with information concerning the within-period progress measured relative to specific goals (Hansen & Mowen, 2006).

*Regression analysis* examines the relationship between one dependent variable and one or more than one independent variables. In other words, this technique tries to explain the changes in dependent variable with the help of independent variables (Altunişik et al., 2005).

# Data and Methodology

The data of this study is gathered from X Electric Inc. Company which was founded in 1990 in Adapazari, Turkey. The company is a Low Voltage Circuit Breaker manufacturer company.

The data has been collected from this company's accounting department. The company's accounting director gave the raw data of the company quality costs. We have analyzed these costs for reporting quality costs.

According to the data, we drew table 1, 2, and 3. With the help of these tables, we made ratio and trend analysis of company's quality costs. The data consists three years which are 2008, 2009, 2010. In the study, trend and ratio analysis have been performed for measuring and reporting the firm quality costs.

# Analysis of Quality Costs in the Firm

The table below displays the company's sales and production amount in Turkish Liras (here after TL). The sales and production amount have been given for three years. Additionally, the table contains of total quality costs in the firm for three years.

Table 1. Some Ratios and Ratio Components in the Firm

Data	Years				
Data	2008	2009	2010		
Total Sales (TL)	629.053.415	695.866.750	786.859.486		
Total Production Costs (TL)	515.326.274	563.708.245	643.590.468		
Total Quality Costs (TL)	10.028.516	11.712.822	12.642.655		
The Ratio of Quality Costs to Sales	1,59%	1,68%	1,61%		
The Ratio of QC to Production Costs	1,95%	2,08%	1.96%		

According to the firm information, the ratios of total quality costs to total sales have been calculated for given three years. And the ratios of total quality costs to total production costs have also been calculated. In the aspect of the information in the previous section, these calculations have been performed as follows.

In 2008, the company's total sales are 629.053.415 TL. In the same year, total quality costs are 10.028.516 TL. So the ratio of total quality costs to sales can be found out as follows;

 $\frac{10.028.516}{629.053.415} = 1,59\%$ 

It can be concluded that the amount of total quality costs is only 1.59% of the total sales in 2008.

$$\frac{10.028.516}{515.326.274} = 1,95\%$$

The calculation above demonstrates that the ratio of total quality costs to total production costs is about 1.95%. For the years of 2009 and 2010, total quality costs to sales and total quality costs to total production costs have been calculated by the same way and written down in the figure above.

This ratio is not too much for an early stage of quality costs analysis applier's company. In other words, the firm analyses its quality costs not long ago, so the rates is in the acceptable limits. Besides this ratios can be reduced for more efficient quality costs system.

When analyzing quality costs data for year 2010 as quality costs components, it will be useful for monitoring quality costs. Regarding this classification, quality costs component will be given as costs items. With the help of this costs items, the percentage amount of each costs item will be also calculated and given for the year.

Table 2. Total Quality Costs as Each Cost Items for the Components in the year of 2010

Components of Quality Costs	Costs (TL)	Ratio (%)
Prevention Costs	1.782.614,36	14,1
Quality Planning	518.348,86	4,1
Quality Circle	75.855,93	0,6
The Training of Quality	202.282,48	1,6
Inspection and Tests Instructions	113.783,90	0,9
Supplier Quality Planning	214.925,14	1,7
Preventive Maintenances	480.420,89	3,8
Other Prevention Costs	176.997,17	1,4
Appraisal Costs	5.031.776,69	39,8
Inspection and tests of purchased materials	1.036.697,71	8.2
Control, maintenance and calibration of measurement instruments	101.141,24	0,8
Process inspection and tests	1.150.481,61	9,1
Consumable materials for laboratory and tests	581.562,13	4,6
Products inspection and tests	1.984.896,84	15,7
Other appraisal costs	176.997,17	1,4
Internal Failure Costs	4.450.214,56	35,2
Salvage	2.225.107,28	17,6
Reproduction and Repairs	1.656.187,81	13,1
Re-inspection	480.420,89	3,8
Corrective actions	88.498,59	0,7
External Failure Costs	1.378.049,40	10,9
Products Returns	998.769,75	7,9
Transportation Damage	50.570,62	0,4
Warranty Costs	328.709,03	2,6
Total Quality Costs	12.642.655	100,0

In the figure 2010, the non-conformance costs are under the half of the total quality costs. This demonstrates that the firm is going in the right way. The company gives more importance for conformance costs day by day, so the non-conformance costs decreases naturally. These changes will benefit the company in more ways than one. The figures below should be reported to the managers for monitoring quality costs activates by management. The importance of quality costs increases day by day.

The next table shows the total quality costs as categorization groups. As it is mentioned before, the quality costs have two components which are conformance and non-conformance costs. And these components costs are given in the chart. Moreover, conformance costs are divided into two cost elements that are prevention costs and appraisal costs. The amounts of these costs are also given yearly in the table. The conformance costs are increasing for the given years. It rose up two times from the amount of 2008 to 2010 amount. It is good for a company to increase its prevention activities in order not to confront defects after selling the products out. Besides, the amount of prevention costs in conformance costs is too small. The firm should concentrate more on prevention costs.

Table 3. The Amount of Quality Costs in Classification through the Years

Quality Costs	2008	2009	2010
Conformance Costs	3.098.811,45	5.177.067,33	6.814.391,05
Prevention Costs	631.796,51	1.147.856,56	1.782.614,36
Appraisal Costs	2.467.014,94	4.029.210,77	5.031.776,69
Non-Conformance Costs	6.929.704,56	6.535.754,67	5.828.263,96
Internal Failure Costs	4.693.345,49	4.767.118,55	4.450.214,56
External Failure Costs	2.236.359,07	1.768.636,12	1.378.049,40
Total Quality Costs	10.028.516	11.712.822	12.642.655

On the other hand, in the table above, the non-conformance costs have been shown in two parts which are internal and external failure costs. The company has endured too much internal failure costs. And, the company should increase its preventive activities and decrease the internal failure costs. When it comes to external failure costs, the firm is going in a right way, because the amounts of external failure costs are going down for each given year.

With the help of Table 3, it can be seen that conformance costs – prevention and appraisal costs – are increasing for each year. Additionally, non-conformance costs – internal and external failure costs – are decreasing for each year. It also shows that the huge amounts of total quality costs are occurred after production stage. The internal failure costs are the biggest costs in the total quality costs for every year. This situation represents that the defects are realized after the stage of production.

Figure 3. The Trends of Quality Costs' Categorization in percentage



In general, the movements of quality costs components are in a right way, even though the non-conformance costs are more than conformance costs. In the chart, it can also be seen that the amount of prevention costs is under the 15% of the total quality costs which means the firm do not pay enough importance for the prevention activities. Although the trend of external failure costs is declining, the external failure costs have too much portion of total quality costs. Having too much external failure costs brings more costs than the firm can measure.

Figure 4. The Trends of Quality Costs' Categorization in TL



In Chart 2, it is again shown the trend of quality costs components. Chart 1 shows the trends as percentage value; Chart 2 shows these trends as Turkish Liras amounts. The inferences of the Chart 2 are similar to Chart 1.

# The Application Results

The quality costs activities in X Electric Inc. are concentrated in non-conformance activities. In other words, the firm is highly interested in internal and external costs. So, non-conformance costs are monthly reported to management. Besides, the firm does not give required importance for prevention and appraisal costs' measurement. Therefore, conformance costs are just reported yearly period, even though the firm is giving more importance to conformance costs than before.

On the other hand, while paying the non-conformance costs more importance than the conformance costs in the firm, the company endures more costs than it can measure. That is to say, the firm can bear the quality costs more than in numbers; there may be a non-visual negative effect on the firm. For instance, the firm may confront the loss of customers, bad brand recognition and poor employee motivation and so on. Furthermore, the efficient quality system causes to benefit the company in more ways than one. It decreases the non-conformance costs and increases profitability of the firm. The firm would have sustainable competitive advantage in the market.

It is found out that the company cannot measure its quality costs adequately, for this reason quality reporting system in the company is not efficient. The company needs to give more importance to the quality costs measuring and reporting activities.

# Conclusion

Previously, the company thought that quality control was just a waste of time. But this thought changed in course of time. With the help of effective quality control system, company can reduce the salvage, loss of labor hours and so on, which increase the productivity level.

Yearly reporting of total quality costs is not efficient for making decisions on these costs. The measurement of prevention and appraisal costs is not made appropriately. The allocation key is generally labor costs which are not suitable for measurement of every costs item in the quality costs.

The firm should establish an efficient quality costs system and determine this system specification for effective measurement and reporting of quality costs. By having reliable and sufficient data in quality costing, company can reduce its non-conformance costs. And it causes to reduce total quality costs and increase profitability of the firm. The firm should prepare instructions and procedures for making measurement more efficient especially in prevention and appraisal costs. Every person in the firm should be informed about these instructions and procedures.

On the other hand, only the quality assurance department is responsible for quality costing in the firm. As it is mentioned in the previous parts, quality is not a person or a department job; it should be responsibility of every person and every department in the firm. The quality costs reports should be prepared and reported monthly. The accounting department should determine more suitable allocation keys for the measurement of quality costs and according to this measurement, the accountants in the firm should make the necessary journal entries for these costs. By measuring and reporting quality costs, the managers can recognize that there is a huge amount of costs which they do not take into consideration while making managerial decisions. They can realize that the non-quality issues increase the evitable costs by too much.

In the short run, investing in preventing activities can increase total quality costs in the firm, but in the long run, these investments will cause decreasing in failure costs. So, the firm will reduce its evitable costs in the long run.

In the globalizing world, the firm should take the products quality into account. Also, it needs to be noted here that a company cannot survive in a highly competitive market with its low quality products. Last, but not the least, it must be kept in mind that the amounts of quality costs never excess the amount of poor quality costs.

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# Social Anxiety and Usage of Online Technological Communication Tools among Adolescents

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#### ABSTRACT

With the growing popularity of Internet communication among KEYWORDS adolescents, the Internet, social media, instant messaging and cell phones have become important social tools in their life. This study examines teens' use of social interactive technologies and the role that social anxiety plays on how adolescents communicate with others (technology or face-to-face). A questionnaire was designed and distributed to selected sample in the cities of Afyonkarahisar, Manisa and Uşak in order to analyze the relationship between adolescents' social anxiety and their preference of communication tool. The data were gathered from 544 respondents among High School adolescents (ranged from 15-18; freshman, sophomore, junior and senior). Findings show that adolescents rarely use messenger sites and mail addresses. They generally send instant messages with their cell phones. They spend 1-2 hours for listening music and averagely 30 minutes for Facebook in a day. More than half of teens have hi-tech cell phones that enable to call, send message and access to Internet. The findings of the present study also reveal that females use text messaging more than males. However, males spend much more time than females to play games. In addition, females feel themselves more uncomfortable than males for face-to-face talking with others. And, on the contrary to males, females also prefer to some extent, to communicate with other on internet instead of face-to-face talking. Similarly, females prefer more than males to make new on internet.

**IEL Codes:** C12, I12

Social Anxiety, Communication Tools, Technology, Adolescents

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# Introduction

The use of socially interactive technologies, such as social media, text messaging or instant messaging rises among young people (Pierce, 2009). Among adolescents, the Internet has become indispensable for instrumental purposes such as school work information gathering as well as for communication purposes. The communication applications of Internet, such as e-mail, instant messaging (IM), blogs and chat rooms have entrenched themselves in the lives of adolescents and Internet has become an important social context in the lives of adolescents today. In fact, a national survey of adolescents (10-17 years of age) revealed that in the year before they were surveyed 25% of Internet users had formed casual online friendships (Wolak et al., 2002; Subrahmanyam and Lin, 2007).

Instant messaging is also an increasingly popular form of communication. A study by the Pew Internet and American Life Project found that 53 million Americans use IM, and 36% of these users reported using IM on a daily basis (Shiu and Lenhart, 2004). IM is a text based form of communication in which two or more people exchange text messages in real time using the Internet (Lenhart, 2005).

Some researches suggest that socially interactive technologies allow users to avoid or replace face-to-face communication (Nie and Erbring, 2000). If the person is shy (socially anxious) and feels uncomfortable with face-to-face interactions, these technologies may serve as a useful tool for avoiding such unpleasant situations and therefore may replace face-to-face communication (Pierce, 2009).

US, Canadian and Dutch studies have shown that the vast majority of adolescents spend several hours daily online. Further surveys show that adolescents consider the Internet a highly important medium in their everyday social life and use it to form and maintain social relationships (Selfhout et al., 2009).

# Motivation

Today, social anxiety, social phobia and shyness are features that seen every individuals of all ages. Both adolescents and adults who have social anxiety against life and their environment scope, has led to more research on them. This study is related on teens

that high school level about 15-18. The beginning of puberty and the end of puberty is the reason why we selected this age range. Because, puberty is a vital phase for growing of young people and determine their personalities. This study is not been applied only Afyonkarahisar teens but also Uşak and Kütahya provinces are included. The purpose of this study is to research adolescents' use of social media, computers, text messaging, cell phones and instant messaging related to social anxiety effective's technological tools versus face-to-face communication. Because, especially 15-20 years-old-teens have been noticed to use on-line communication means having faster and interactive features rather than having face-to-face communication while talking to their friends or their parents. Consequently, in this study, the reason for this choice has a connection with whether social anxiety or gender will be researched.

# Literature Overview

# Internet Use among Teens

Use of Internet continues to increase worldwide. Colley and Maltby (2008) indicated that, 57% of households now have access, in comparison to 46% four years ago in the UK (National Statistics, 2006). The Digital Future Project in the US has found that 78.6% of Americans went online in 2005, with an accompanying increase in the amount of time spent per week on the Internet (Center for the Digital Future, 2005).

Many of the studies in this area have been conducted with university students, in part because of their widespread use of the Internet as a social tool; indeed such use among students is increasing. In addition, a number of studies have found a high prevalence of social anxiety among university students who may then turn to the Internet as a way of regulating, challenging or escaping their social fears (Shepherd and Edelmann, 2005). Many university students commenting that they are shy in social situations, but are more open, easy going on the net, in chat rooms. They are shy about approaching people at a party or in large group, for example, but not about talking with people in chat rooms.

# Cell Phone Use among Adolescents

Auter (2007) researched that some of them related to adolescents and young adults use the cell phone differently than their parents and other older users. They prefer to consider it their primary phone –traditional landline phone – for its. Some studies have found little or no difference in use based on gender (e.g., DeBaillon, 2003; DeBaillon and Rockwell, 2005). Other studies have found, however that boys tend to be more intrigued with technical aspects of the devices, while girls tend to prefer the interpersonal connectivity – and spend more time using their phones for voice calls (Henderson et al., 2002; Rakow and Navarro, 1993; Skog, 2002). In fact, while women in one study felt the phones resulted in more freedom, male teens found the additional connectivity a constraining inconvenience.

A recent Pew Internet research study found that approximately 33% of teens have a cell phone. Of the 33% of teens who reported owning a cell phone, approximately 64% said they had sent text messages. In addition, the Pew study found that of the young cell phone users, teenage girls tended to use text messaging much more than their male counterparts. Older teens (17 year olds) also reported sending more text messages on average than younger teens. Although cell phone use and text messaging have risen among U.S. teens, their popularity remains considerably less than European teens (Lenhart et al., 2005; Pierce, 2009).

Seventy-five percent of teenagers now own cell phones, and 25% use them for social media, 54% use them for texting, and 24% use them for instant messaging. Thus, a large part of this generation's social and emotional development is occurring while on the Internet and on cell phones (Hinduja and Patchin, 2007).

# **Instant Messaging**

The two previously mentioned theoretical approaches might adhere to different types of Internet activities that may have differential effects on well-being. One type of activities surfing, which can be described as visiting web sites on the Internet for non-communication purposes. In contrast to surfing, Instant Messaging (IMing) consists of sending messages directly to others one has invited to the online conversation. Because of its dyadic, real-time, and private format, IM-ing has been as an excellent 'training ground' for adolescents in terms of their social skills (Morgan and Cotten, 2003; Valkenburg and Peter, 2007). A survey study showed that among freshmen college students whereas increased time spent IM-ing was uniquely associated with less reported depression, increased time spent surfing was uniquely associated with more reported depression (Morgan and Cotten, 2003).

# Social Anxiety and Gender Differences

Social anxiety has variously been referred to as both shyness and social phobia. Social phobia, (also known as social anxiety disorder) is at the more extreme end of the continuum of social anxiety and "includes a collation of symptoms which unlike shyness can vary in severity throughout one's life" these symptoms are only elicited in certain social situations (Leary, 1983). In contrast shyness while at the less severe en of the social anxiety continuum is more likely to be a life long characteristic of an individual's temperament which is experienced in every social occurrences (Lecrubier et al., 2000; Shepherd and Edelmann, 2005).

Individuals are often motivated by a need to feel a sense of belonging; however, those with social anxiety may find it difficult to fulfill this social need because of the Internet. For socially anxious individuals, the Internet and socially interactive technologies (text messaging) can have both positive and negative results. Kraut et al (1998) found that online interaction greatly reduced face-to-face social interaction.

Females usually have more negative attitudes toward computers and greater computer anxiety than males. Researches on computer self-efficacy in general also revealed that males on average have better computer self-efficacy than females (Hackett, 1985). Similarly, one might expect adolescent girls to be more worried than boys about peers' negative evaluations of them. Indeed, surveys have found that adolescent girls are more concerned than boys about others' judgments of their appearance and behavior. Moreover, rates of internalizing problems are higher among girls than boys and adult women are about twice as likely to be socially phobia as men (Schneier et al., 1992). Thus, adolescent girls may be more vulnerable than boys to feelings of social anxiety, and this may have implications for their social functioning (La Greca and Lopez, 1998).

Jackson et al. (2001) predicted that women would use e-mail more and men use the Web for information more, based on the greater interpersonal orientation of women

and greater task orientation of men. This prediction was supported in a large sample of Anglo-American undergraduates, even after computer self-efficacy, loneliness and depression were controlled for. Wasserman and Richmond-Abbott (2005) found that women use e-mail slightly but not significantly more than men but that men use chat rooms more. Shepherd and Edelmann (2005) study social anxiety and Internet use to explore in relation to regulation of social fears. It is hypothesized that high social anxiety will be associated with low ego strength as well as greater scores on the Internet.

#### Methods

### Purpose

It is very important to analyze of instant messaging, text messaging and other socially interactive technologies among teens due to significant popularity. Since social anxiety can affect one's type of social interaction, it is prominent to examine if social anxiety is influencing how adolescents communicate with others and which technology. The purpose of this study is to research adolescents' use of online social sites, cell phones, test messaging and instant messaging and if social anxiety influences technology versus face-to-face communication. So, the following hypotheses are proposed:

- H1: Females use socially interactive technology (text messages, cell phones, e-mail, and instant messages) more than males.
- H2a: There is a relationship between not feeling comfortable talking with others in person and feeling more comfortable talking with others online.
- H2b: There is a relationship between not feeling comfortable talking with others in person and feeling more comfortable messaging with others.
- H2c: There is a relationship between the amount of their families' monthly income and social anxiety.
- H3: Males are more social anxiety with face-to-face interactions than females.
- H4: Males are feeling more comfortable talking with others through a social interaction technology than females.

### Participants and Data

The data was gathered from 544 students among High Schools in Afyonkarahisar, Kütahya and Uşak cities. The age of the participants ranged from 15 to 18. 32.4% were freshman, 24.1% were sophomore, 28.1% juniors and 15.4% were seniors. The sample consisted of 227 (41.7%) males and 317 (58.3%) females.

We first were contacted the principals and asked permission in order to survey some classes on school. After that, teacher was chosen to gain a sample of students from each school year. After obtaining permission from teachers, each student was warned about survey able to tell it their parents. The survey was applied in the students' classrooms and teachers were present during all testing. All students received the same instructions and their identity would remain secret. Each participant completed a report questionnaire.

### Measures

The first two questions of the questionnaire consisted of primarily demographic questions such as age, sex, year in school, and general information. The next series ten questions included items of the students' comfort level in interacting with others face-to-face, online talking, cell phone or text messaging. Questions were prepared by using both nominal (yes or no) and 5 point likert-type scales. All hypotheses were developed by us to measure the relationship between social anxiety and usage of technological tolls among teens. The reliability of tests confirms our measurement (Cronbach  $\alpha$ =72.4). This test can be acceptable according to rule of thumb for describing internal consistency  $0.7 \le \alpha \le 0.8$ 

#### Results

3.7% stated the amount of children who separate from their families is not adequate for measuring the relationship between social anxiety and family situation. First of all, participants were asked about type of technological tools they had use.

- 88.9% reported having personnel computer.
- 79.2% reported having Internet on their PC.
- 92.6% stated that having messenger address.
- 73% reported having e-mail accounts.
- 96.7% reported having cell phones.
- 72.2% reported having text messaging capabilities on their cell phones.

• 84.3% stated having social media sites and most of them are using Facebook (49.2%). Most of the other has more than one membership in social sites (twitter, MySpace, LinkedIn etc).

The following next questions asked how much time adolescents use each of their time on their technological tools on average day. Table 1 shows the results.

Table 1. Technological tools use

	9 h + (%)	7-8 h (%)	5-6 h (%)	3-4 h (%)	1-2 h (%)	30 min (%)	None (%)
Msn	0.4	0.4	0	0.6	4.3	13.6	80.7
Instant message	3.7	2.2	4.6	10.8	17.5	23.6	37.5
Cell phone	0.6	0.2	0.4	2.2	11.9	56.9	27.8
Social sites	0.7	1.7	1.5	8.0	29.0	33.3	25.8
Music	3.9	2,4	5.0	10.3	39.0	31.8	7.6
Game	0.7	0.9	1.3	4,3	17.7	24.0	51.0
Mail	0.9	0.2	0.2	1.1	3.9	12.8	80.9
Internet	1.1	0.4	1.1	6.7	26.8	40.1	23.8

As shown in Table 1, adolescents rarely use messenger sites and mail address. They generally send instant message with their cell phones. They spend 1-2 hours for listening music and averagely 30 minutes for Facebook in a day. More than half of teens have cell phones that enable to call, message and access to Internet. All following hypothesis were examined to 95% level of confidence.

Regression analysis was made to see the relationship between feeling anxiety and family income with technological tools usage among adolescents; T-test, Chi-square test and one way ANOVA test was performed in the study to see gender differences with technology use, face-to-face interaction, talking online, making friends online and playing games.

Variables	Variables				nple (n:544)		
Dependent	Independent	Coefficient	Standart deviation	Significant (p)	Correlation coefficient (r)		
Condor (tochnology uso)	Males	1.52	2.31	0.010			
Gender (technology use)	Females	1.08	1.90	0.019			
Gender (face-to-face interac-	Males	1.86	0.99	0.002			
tion)	Females	2.12	0.92	0.003			
Conder (talking online)	Males	3.48	1.05	0.000			
Gender (taiking onnine)	Females	3.71	0.96	0.009			
Conder (making friends online)	Males	3.62	1.19	0.000			
Gender (making menus omme)	Females	4.14	1.04				
Camp	Males	0.30	0.75	0.000			
Game	Females	1.06	1.66	0.000			
	Instant message	0.069	0.054	0.201			
Ecoling anyioty	Social sites	0.139	0.052	0.008	0.440		
reening anxiety	Msn	-0.005	0.025	0.851	0.449		
	Cell phone	0.308	0.045	0.000			
	Instant message	173,737	119,286	0.146			
income (monthly)	Social sites	-270,341	115,816	0.020	0 125		
income (monuny)	Msn	-8,104	55,636	0.884	0.125		
	Cell phone	-38,099	99,021	0.701			

After T-test was made for hypothesis 1, table 2 shown that females (M: 1.08, SD: 1.9) reported that they are using text messaging more than males and significant relationship between text messaging and interactive technology (M: 1.52, SD: 2.31, p: 0.019). In addition, males (M: 0, 3, SD: 0.75) spend much more time than females to play games and there is a gender differences between playing games on computer and social technology using (M: 1.06, SD: 1.66, p: 0.000). There are not gender differences in use of instant messaging, e-mail, social network sites and chat rooms.

When someone have to talk face-to-face, feeling anxiety was positively correlated with feeling comfortable with others through cell phones and social media sites (r:0.449, p: 0.000). There isn't a relationship between social anxiety of face-to-face interaction and feeling comfortable with others via messaging (p: 0.204). The regression analysis showed, there isn't a relationship between the amount of families' monthly income with social interaction technologies (p: 0.230, r: 0.125).

According to the results of Chi-square test, significance was not found for hypothesis 3. However, a female feels more uncomfortable than males for face-to-face talking than males (Levene's test p: 0.017). There is just significant differences feeling comfortable by talking with social media sites with gender (p: 0.003), that is; famales (M: 2.12, SD: 0.92) are more uncomfortable than do males (M: 1.86, SD: 0.99, p: 0.000).

There is significant difference for hypothesis 4, after One-way Anova test was made, teens prefer talk with someone on computer instead of talking and make new friends with someone on computer. Females (M: 3.71, SD: 0.96) prefer talking with some on computer instead of talking face-to-face than males (M: 3.48, SD: 1.05, p: 0.009). Similarly, females (M: 4.14, SD: 1.04) prefer making new friends with someone on computer more than males (M: 3.62, SD: 1.19, p: 0.000).

# Conclusion

In Turkey, cell phone, text messaging, instant message and social sites membership are recognized as the most important medium of communications among adolescents. Internet access via PCs and mobile phones plays very significant role Turkey adolescents. Technology tools effect teens' social emotions against their families and friends. This study demonstrated that teens are using socially interactive technology to communicate with others and it serves social anxiety and decreasing face-to face communication.

The findings of the current study found that females are using text messaging more than males. However, males are playing games for a long time than females. In addition, females are feeling more uncomfortable talking with others face-to-face than males. And, females also prefer talking with some on computer instead of talking face-to-face than males. Similarly, females prefer making new friends with someone on computer more than males.

Beyond the results of this study, we examined something very important situation related to adolescents' today currents. While the age of participants were increasing, the time spend in social media is decreasing. The reason for such conclusion revealed that, senior students have to work more for university exams during education session. So, they can't spend much more time on social media sites.

Many studies in this area is conducted for university students. The use of Internet as a social tool is more common among at this age adolescents. But this study is related to high school level for students and we examined the relationship between social anxiety and the use of Internet, cell phone as a technological tool. Further studies may apply for university students.

Finally, adolescents who may be shy, have social phobia, and feel anxiety about talking with someone, various and different technologies provide reliable opportunity for them to contact with them. It is possible to reproduce the contributions of technology for our world. Although this technology facilities the lives of people, it sometimes breaks the peace. Technology has changed the way we live today and also changing our communication skills with high costs. Only time will tell what is going on in the future. Parents and teachers have great responsibilities for this subject.

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#### Appendix 1

The purpose of this questionnare is to research 15-20 year old adolescents' use of online social sites, cell phones, test messaging and instant messaging and if social anxiety influences technology versus face-to-face communication.

	Assoc. Prof. Ali Eleren	Asst. Prof. Sinan Yörük	Reserch Assist.			
Bil	al Şişman					
1.	What is your sex?MaleFer	nale				
2.	What is your year in school? (select only one)	)				
	(9)(10)(11)(12)	)				
3.	What is your families' total income?	TL				
4.	Does your mother and father live together?	Yes	No			
5.	Do you have a daily computer?	Yes	No			
6.	Do you have a Internet access on your comp	uter?Yes	No			
7.	Is your Internet connection wireless?	Yes	No			
8.	Do you have a instant messaging address?	Yes	No			
9.	Do you have e-mail address use actively?	Yes	No			
10.	Do you have a cell phone?	Yes	No			
11.	Do you have access to the Internet on your co	ell phone?Yes	No			
12.	Do you have a social networking account?					
(Tw	ritter, Facebook, MySpace etc)	Yes	No			
13. If yes on 12, which of the following social networking do you have?						
	FacebookTwitterLi	nkedinYoutube	Classmates			
	Other (please specify)					

14. On an average day, how much time do you spend with each of the following?

	9+	7-8	5-6	3-4	1-2	30 min-	None
	hours/	hours/	hours/	hours/	hours/	utes/	
	daily	daily	daily	daily	daily	daily	
Instant messaging							
Text messaging with cell phone							
Talking with cell phone							
Social networking							
Listening music							
Playing game							
E-mail							
Online (surfing on the Internet)							

15. How comfortable are you talking with friends, family and teachers face-to-face? ---Very comfortable ---Comfortable ---Normal ---Uncomfortable ---Very uncomfortable 16. Do you find yourself getting anxious when you have to talk with someone face-to-face? ---Always ---Frequently ---Sometimes ---Rarely (very few) ---Never 17. How comfortable are you talking with others using text messaging? ---Very comfortable ---Comfortable ----Normal ----Uncomfortable ---Very uncomfortable 18. (If yes on 12) How comfortable are you talking with others on your social networking sites? ---Very comfortable ---Comfortable ---Normal ---Uncomfortable ---Very uncomfortable 19. How comfortable are you talking with others on your instant messaging? ---Very comfortable ---Comfortable ---Normal ---Uncomfortable ---Very uncomfortable 20. How comfortable are you talking with others on your cell phone (talking)? ---Very comfortable ---Comfortable ---Normal ---Uncomfortable ---Very uncomfortable 21. How often dou you text message someone instead of talking to them face-to-face? ---Always ---Frequently ---Sometimes ---Rarely (very few) ---Never 22. How often do you talk with someone on the computer instead of talking to them in person? ---Always ---Frequently ---Sometimes ---Rarely (very few) ---Never 23. How often dou you text message someone instead of talking with them on the cell phone? ---Always ---Frequently ---Sometimes ---Rarely (very few) ---Never 24. How often dou you make new friends with someone on the computer? ---Always ---Frequently ---Sometimes ---Rarely (very few) ---Never 25. When confronted with a difficult stuation with another person, which of the following would you typically use to talk with other person? -----Text messaging with cell phone -----Talking with cell phone -----E-mail -----Instant messaging -----Face-to-face communication

-----Social networking sites

# State as the Source of Wealth: In Ottoman Economic Thought: A different approach to reflections in the aftermath of the global crisis

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#### ABSTRACT

This study aims to deal with the ways of creating wealth by economic KEYWORDS activities, presenting experiences within Ottoman state tradition and a Ottoman, Global Crisis, Market role of Ottoman state during this period. In this context, the economic Sistem power achieved by the state will be explained through examples of practices.

The role of the state in the economy has been raised with the latest global crisis and despite the historical expriences, this role has been started to debate in the economics. In fact, the corrupted state concept should be re-evaluated and re-established. Otherwise, re-evaluation of fundamental issues such as market system or freedom of enterprise wouldn't contribute much to the solution of the problem.

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#### **ARTICLE HISTORY**

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# Introduction

In the traditional Islamic thinking, economy was subsistence and economic activities were mainly based on the supplement of daily requirements. Although there was no prohibition of becoming prosperous or accumulating wealth, owners of the wealth were advised to spend it for charity. According to Holy Quran and the Sunna, words and acts of the prophet Mohammad, basic sources of Islamic knowledge, and principles of justice were important in economical affairs, and legal way of earning were accepted equal to worshipping. However, after the establishment of sultanate tradition, the state transformed a source of income mechanism into a distrubition of wealth mechanism.

Ibn-i Haldun,a famous philosopher of Islamic world,addressed the both normative and positive sides of the issue and stated that the state got power in the area where it shouldn't have had it. According to Ibn-i Haldun, there were three ways of subsistence and income: agriculture, industry (crafts) and trade. It seems that he considered agriculture and industry affirmative while trade was doubtful. He considered agriculture and crafts honorable, because they rely on one's direct labor and effort. But they both did not make a person rich. In addition, Ibn-i Haldun mentioned public service as a means of getting rich, despite the fact that it was not a regular way of subsistence. He thought that people should get close to either the state or trade in order to be rich.

Imaret, described as a state governing by Ibn-i Haldun Imaret, was the way of collecting taxes through confiscating someone's wealth using political power and administrative office. Therefore, state work is not a natural way of make for a living. He described the civil cervants as feminine people who cannot do their own business. According to Ibn-i Haldun the ones who cannot come close to the state in order to protect his capital and to be rich, in his own words "the ones who do not indulge and lick someones' boots" cannot have wealth because wealth is produced by public office. The ones who seize the power and who come close to the rulers became rich.

Therefore, this study aims to describe the ways of getting rich appropriate to Ibn-i Haldun and reveal the formation of them in Ottoman Empire. Trade, public services and companies were predominantly analized in this study.

# Role of the State in the Economy

It is not possible to state that trade was excluded in the powerful central administration of Ottoman Empire. In terms of the state intervention to the markets, the central administration was parallel with the system of administration apart from some applications. The purpose of the state was to suppress all kind of power and influence of local authority over the economic life and to obtain a great influence over all kind of goods as well as people by means of eliminating the intermediate agents between the subjects and the Sultan (Güçer, 1987).

Although, the main purpose seems beneficial for the citizens as it is frequently appears on the documents such as "public good", "development and prosperity of the country" or "increasing the welfare of the citizens" (Tabakoğlu, 1994), it was actually decreasing the state's reserves as it was frequently appears on documents such as "working to increase the state's wealth without taking inadequate taxes". Some interventions aimed to take taxes while others aimed to buy goods and services below the market price by the state.

**Dominant State Policy in Markets:** Although, the prices were formed by a system determined by the state, the markets were not competitive in mant big towns, notably İstanbul had had a dynamic economic life. It can be claim that the narh system, the state intervention on the market prices, had negatively affected this dynamism.

*Aims of The Narh System:* In addition to economic aims, there were political, moral and administrative aims at the narh system. A brief study of these aims will show the functions of the narh system. Although to separte these aims is diffucult, significant ones can be determined based on the classification of examples. These can be listed as follows:

Administrative and Politicial Aims: Sultans and "sadrazam"s sometimes had attempted to lower the narh or to keep it low in order to reinforce their positions as well as to get the support of the general public. These attempts were embodied in expressions found in "hatt-1 humayun" (decree of sultans) issued by Selim III to "sadrazam" Musa Paşa (*"make sure that the price checks are strict and satistaction of the citizens is ensured. Also affairs of citizens should be facilitated through your day-andnight efforts. Blackmarketing should be prevented in order to supply the needs of people*  *in Istanbul. The behaviours against rules should be punished* (Pakalın, 2004). According to Tevkii Abdurrahman Paşa, a regulator, the narh should not be haphazardly dertermined. According to Şehit Ali Paşa, the form of "*putting into effect the prices by the state should not be controlled by the judges and municipal police, also it should be checked on a daily basis. Overcharging should be eliminated. You should be aware of the fact that the narh is the most crucial work of the state.*"

Therefore, the narh system was not only for regulating the price stability but also played a significant role in maintaining the order of the community. In his book entitled "*Fusul-i Hall'ü Akd and Usul-i Harc-i Nakd*", Gelibolulu Mustafa Ali points the following justifications as the purpose of the book: "... with increasing population, narh system could not be effectively practised. Thus, order of the society deteriorated, judiciary corrupted, and the system got into the hands of the dishonest. The sultan cannot be thought of accepting this(Yücel, 2003). "

In this concept, deterioration of the narh, judiciary and social order are accepted as the same. Since the price instabilities which had the same meaning with the weakness of the state authority were taken as an indicator of administers' and public's weakness. This issue was taken seriously. It was also taken serious because speculations were forbidden religiously for the public.

The narh system was not only to protect the consumers but also was necessary for the protection of produces and traders. Thus, the aim was to prevent non-standard and fraudulent good's trade. There were various restrictions for traders who acted against the narh. For example, in a decree issued to Judge of Istanbul and municipality police in 1676, the Sultan himself dealt with the packaging and selling procedures for pears brought to marketplace: *"Order to the Judge of Istanbul and Municipality Police Chiefs: As "Pazarbaşı" Veli and his deputies complained, since pears come into the marketplace, they are put into small boxes and sold as boxes, the poor cannot buy these boxes. The sales should be like before, i.e. Pears should be brought to the marketplace in big boxes and sold by kilograms based on consumer's need. "(Çağatay,1981). The administrative interest abaout conforming to the narh system also involved quality and standard of the goods. For example, when it was noticed that the quality of fabrics produced in Bursa deteriorated, an inspector was sent to Bursa in 1477. The inspector found out that a cheaper production method was adopted due to increased raw material prices. This reason was approved and new product was allowed (İnalcık, 1993).* 

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**Financial reasons:** Fixed prices due to the narh system provided major advantage for the state, because state was the major buyer. The state could buy for lower prices. For example, grain prices formed as free market and the state had had to buy on that price. Free market prices were usually monitored on heritage notebooks and the prices on "tereke" notebooks were always higher than official ones. The reason was the higher "resm-I kısmet" (a kind of heritage tax) taken by judges because of higher "tereke" price. Although, price of wheat per kg was 11 "guruş" and the price of barley per "kile" (a weight in unit) was 5 "guruş" in 1799 at Tokat, according to official purchases by the state, price of wheat flour was 4.0 "guruş" and barley was 2.25 "guruş" (Öz-türk,1987). However, it would not be realistic to say that official prices were always kept low and the narh prices were continuously suppressed by the state. Considering the fact that vast amount of agricultural products were sold in the market, it would be true to assume that suppressed prices were only common in extraordinary situations.

**Direct Interventions To Trade:** Other than mentioned above, there were another intervention methods in trade. These were "yedd-i vahid" (monopoly) practices, regulations about market places and trade regions, gedik method (a kind of quota imposed on the craftsman about the number and location of businesses) and various confiscation procedures applied to traders. The aim here was to prevent speculations, blackmarketing, deceptive sale practices, and to establish the order in the country. Food supply in big cities was an issue to which much significance was attached and attention was paid. Ottoman administrators were deeply taking into account that a well running economic life would make other state affairs smooth. Otherwise, there would be many social and administrative problems. "Gedik" and "yedd-i vahid" practices aimed to facilitate the work of the tradesman and to keep things well organized establishment content.

Although, confiscation procedures mainly involved state afficials, it applied traders who were thought to have become unjustly rich. Even in financially difficult times, state did not covet traders' wealth. There was a significant explanation about this subject in "hatt-1 humayun"s issued by Selim III.During 1787-1792 Austrian-Russian Wars,the state was in financial difficulty and Sultan asked for financial solutions. This was explained by Selim III as follows: *"Kaymakam Paşa" what I say to you is: "There can be no answer if the state has no money, then how can we live such a pretentious lives and what did we consume? We showed our enemies that we are weak. And looking at your situation,I am surprised. Just tell me how it could be possible. You have been in public service for so long, you are the one who knows where the extra five akçe(a currency unit) is, and you are asking me. You said that this is away from here, and*  *didn't I take it?* (Karal, 1999) Although, upon this decree, Sadrazam wanted to confiscate heritage and merchandise of some traders, the Sultan strongly prohibited and saying: "Seizing the belongings of orphans is something contrary to my opinion. I can not allow to touch them.Whatever accumulated by someone should be left to his or her heirs after the death, whether it is accumulated through trade, farming or crafts, should be left to his heirs, after his death. Don't ever touch them! Only the wealth of public servants belong to state treasury, neither to me or to his heirs. All of them should be spent for public. Our ascendants did so. If the accountant is afraid of God, he shouldn't touch the heritage of craftsmen, otherwise he will be severely punished."

One of the clearest examples of direct interventions to market was obligatory migrations practiced upon traders in order to develop trade in some areas. However, these exchanges were provided some tax exemptions. After the conquest of Kefe, 300 traders, and their families, were deported to Istanbul. It is known that livestock traders and butchers worked under coercion in order to keep meat supply running in large towns, and free trade conditions were not applied in this area of work (Pamuk, 1994).

# Corporate Movements and Status of the State

Being dominant in trade through the narh system, the state closely followed developments in the west regarding market economy and corporate movements, also tried to be involved in these activities. As a matter of fact, the first corporation "Şirket-I Hayriye" was established by the state. In this subtitle, the state's effort to manage the process of capitalist development without losing power will discuss.

**Partnerships in Ottoman Trade Life:** Although, tradesmen and craftsmen were confined with the strict laws which entrepreneurs had sufferd a lot, it seems that Ottoman State closely watched the corporate movements in the west. There is no doubt that partnership culture and practices always survived as an indicator of a deep rooted tradition. However, there were major differences between the corporate tradition of the west and Ottoman applications.

There are three types of contract based on partnership in Islamic law consisting of capital, labour and credibility. These were in the form of "Şirket-i Inan" (a kind of

labor-capital partnership) and "Mufavada Şirketi", a kind of cooperation based on the equal rights of family members. Records about these partnerships were taken from "Mecelle" was common in "Şeriyye" Records. "Şirket-i Inan" practice was common among vegetable oil and honey markets, especially in far away trades. They had started from the supply of the product and ended when the product reached to Istanbul where it was shared. In some practices, it was seen that people became the joint-owner of ships through giving loans to ship owners as similar to the western practice (Farooqhi, 1993). Apart from this small scale partnerships which did not require much capital. Especially after beginning of the "Iltizam" practice, privatization of tax revenues, partnerships involved the merging of large companies had started to be common (Gedikli,1999). However, this kind of partnerships which require great amount of capital accumulation was formulated based on some privileges provided under certain circumstances and uncertain conditions (Cezar, 1986). Private entrepreneurship and corporate culture had not developed adequately due to the fact that the capital accumulation was in the hands of high officials and profitable business was possible only between privilegers.

As a result of "iltizam" practice, owner of "dirlik" (money obtained from the state land used for soldier training (similar with *latifundia* in Rome) were disappeared. Life-long "mültezim" concept appeared and provinces were left to "mültezim"s. Therefore, non-muslim traders gained power by means of the governor's policy. Towards the end of the 18<sup>th</sup> century, some of this "sarraf" s had fortunes more than a million pounds. These minority members were in close contact with foreign traders and they played significant role about providing loans to the state (Tezel, 1986). They acted like the treasury of the state during the hard times for financing military expences and like financial crisis. For example, in 1878 460,000 pounds were taken from banker Zarifi for military expences. Another document shows that "miri" farms in Yanya were given away for paying a previous loan of 25,000 Turkish liras.<sup>1</sup>

Embassies and consulates of foreign countries started to market their own goods in modernization and especially in the later half of the 18<sup>th</sup> century. In this period, partnerships with minorities had become more and more common. These minority traders were also benefiting from various privileges given to foreign traders through merging. There were many minority members who changed their nationality. After securing minority rights through "Küçük Kaynarca" Treaty, this practice had become even more common and disguised traders became registered ones. Thus, the state could not stop this trend and gave the rights to its own minorities which were

<sup>1 -</sup> B.O.A. Yıldız Tasnifi, Sedaret Resmi Maruzat Evrakı no:1-40

previously given to foreign traders and "European Mechanthood" was established. In order to keep balance, these privileges were given to Muslim traders with some extras, thus "Hayriye Merchanthood" was established. Unlike the former traders, later ones were also given the privilege of trade to Persia and India (Tabakoğlu, 1994).

Corporate Movements in Ottoman Empire: There were some opinions in "Tanzimat" period that the economic problems country experienced could be overcome through corporate development. Sultan Abdülmecid stated that he struggled a lot to take loans but he failed and and revenue-increasing measures, such as forming companies as in other countries, were necessary to overcome the financial problems (Koraltürk, 1999). Ministry of Trade was established in 1840 and "Kanunname-i Ticaret" act of 1850 decelerated some developments about corporate development."Kanunname-I Ticaret" was a translation of French law titled "Code de Commercé" of 1807 with some minor modifications. This act was current until 1926 and provisions about companies were mentioned in its 11th, 13th, 14th, 19th articles (Şekerci,1981). According to an expression in 13th article, constitution which was formed in 1876 "Ottoman subject has rights to establish all kind of companies for trade, crafts and agriculture provided that they obey the rules and order". Cevdet and Fuat Paşa established the first Ottoman share company, "Şirket-i Hayriye",in 1851. At first, operating ferries were between Bosphourus and Karaköy. "Şirket-i Hayriye" increased its activities year by year, and became a modern business after obtaining the privilege of Bosphourus transportation. As a consequence of these developments, many maritime businesses were formed using state protection and practices after 1910 (Eldem, 1994).

Board of Industrial Development operated between 1860 and 1873 focues on corporate development and worked on restoration of craftsmen unions. The purpose was to collect the craftsmen operating as scatterd under share company system with a common capital investment. However, when the board started to dominate every decision from appointment of company executives to profit margins and sale prices, desired benefits were not achieved. An example of these efforts was a share company run by leather craftsmen of Istanbul with a capital of 10.000 golden coins.

Corporate development gained speed in the second half of the 19<sup>th</sup> century. Following Şirket-i Hayriye, Bank-ı Osmani and Şirket-i Osmaniyye that run Aydın-İzmir railway were established. A majority of companies formed in this period were privileged foreign companies and they conducted banking, insurance, railways, mining, utiliy gas aand tramway operations. These were foreign companies. Until 1908, the number of share holding formed and involved in economic activities in Ottoman land was 86. However, a total of 236 companies were established in 1908-1918 period only (Toprak, 1997).

In the process of corporate development and strengthening the capital structures Galata Bankers who had been operating since the time of Sultan Mehmed made significant contributions. During the reign of Abdülhamid,not only public debt securities but also shares of companies which had been operating in transportation business such as railways, tramway, tunnel, and in mining, water, natural gas, electricity and manufacturing areas were being traded in Galata Stock Maket. Galata Stock Market started to buy and sell state bonds and company shares.Sultan Abdülhamid, himself, was involved in these affairs by means of his private banker Zarifi and it took public attention to this area (Kazgan, 1995). By the act of "Development of Industry" which had been put into effect after "Meşrutiyet", corporate development was encouraged and domestic companies were started to be established. Most of these companies were included in the list of Shares and Bonds Stock Market. Companies quoted in the stock market were in different industries such as such as Thread and Linen Goods Share Company (with a capital of 10.000 Lira), Ottoman Anonymous Ittihat Company (with a capital of 100.000 Lira), Ottoman Anonymous Rubber Company (with a capital of 20.000 Lira), Ottoman Marble Company (with a capital of 25.000 Lira), Turkish Naphta Industry (with a capital of 250.000 Lira) and "Dersaadet Cheesemaker Teavün" Company Company (with a capital of 25.000 Lira)(Fertekligil, 2000). Figures about factories and manufacturing plants in a statistical record dated 1897 gives information about trade life. Under the title of "Memalik-i Mahrusa-1 Şahane'de mevcut fabrika ve değirmen vesairenin nev'i" (number and kinds of factories and mills in Istanbul) 23.837 business places were mentioned (Güran, 1997).

Corporate concept in Ottoman Empire appeared as privileges of share corporations. In the study of Mehmet Cavid Bey entitled "İlm-i İktisat" after explaining various corporate types, the following information regarding share corporations were given (Mehmet Cavid Bey,2001). "A majority of companies are share companies. They performed profitable activities and much of work especially in trade and industry is done by these companies. As other European countries establishment of these companies are subjected to Sultan's approval. Besides the company has to follow some procedures in order to get privilege". Therefore, the key condition for the company was to obtain a privilege. While the corporates in the west formed around the capital accumulation. They were quite different in Ottoman Empire in terms of their logic since they did not fit to partnership cooperation.Ottoman corporate development process completely relied upon privileges, and getting rich through trade which was possible only via the permission of the state.

# Public Service and Its Monetary Advantages

Strong bureaucratic structure in Ottoman Empire was a result of an effort which was to keep permanently the government in the hand of centralized administration. Therefore, the public service officers were pleased financially to create a strong bureaucracy. The richest top ranking officers known as "devletlü" were remarkably in large numbers. The methods to obtain a fortune for high ranking officers will be clarify in this chapter.

**Monetary Awards:** The issues such as great military achivements, excellent pursuance of assigned duties, and neutralization of oppositions taken place against the Sultan were the prominent awarding examples within the bureaucratic structure of Ottoman Empire.

Since entering the public service had been a matter of good chance, young people were accepted to the palace after passing all tests. They had been hardly training. Entering to the palace was not easy and selected ones had to have certain qualifications (Ricaut, 1686). According to Gökyay *"When Architect Mehmet Ağa, who built the Blue Mosque, entered the office in the Palace, he saw the attention paid towards the musicians and wanted to be a part of this profession. He convinced his master to give him lectures on music. However, after a dream he gave up this profesion and decided that it would conflict with his belief. After getting know the various artisans in the palace, he was interested in the art of <i>"sedefkar"s, inlay workers using mother-of-pearl, and decided to perform this art.* "Although the training given in the palace and criteria the young people were subjected to decide the occupations to be assigned were out of the present study's scope. It is important to note that the trainees could select the occupation themselves. It seems that this practice had aimed high productivity from the very first day in public service (Gökyay, 1988).

In fact, there was no need for additional awards since Ottoman administration system. The upper office was quite awarding financially and the state officers had done their best to get upper offices. In order to understand the income of the high officers the following incidence reported by Mustafa Nuri Paşa is interesting "*During the end of* 

the reign of Sultan Mahmud II, Paris ambassador Ahmet Fethşi Paşa was appointed to "Sancak" of "Aydın" and then the commander of division and former chief commander Namık Paşa was appointed as a "müsellim" with 25,000 "guruş" monthly salary. After a while, Ahmet Fethi Paşa came to Istanbul and then went to Aydın. He offered Namık Paşa 25,000 "guruş" in addition to income of all "mukataa"s and under-door revenues and other income for his sustenance. Since Namık Pasha did not accept the offer, he appointed Ahmet Efendi, one of his relatives as his müsellim. After earning two million guruş of income that year, Sultan Mahmud II notified the Minister for Mukataas Nazif Pasha and allowed Ahmed Fethi Pasha to keep only the half of the income and returned the other half to treasury. The aim of this example is to show that governors and mutasarrifs of sancaks with good incomes had very high incomes and they hadn't needed extra money from taxes imposed on the people. Here, salary differences between administrator and deputy classes were significant. According to accountant records of Istanbul Palace in the period of 1555-1556, daily income of "Dar'ül Saadet Ağası" was 45 "guruş", while 24 "ağa"s which had worked under his supervision was only 5 guruş (Barkan, 1979). In statuebooks, chapters had not only the job description but also had the salary aspects of the officers. For example, "and beğlerbeğilik is the path of four people: province chief accountants, approval officer on behalf of the Sultan, judges whose incomes were five hundred "akçe" and province "bey"s whose incomes reached four hundred thousand akçe (Akgündüz, 1990)". Therefore, significance of officers were defined based on the income income obtained. Besides, statue changes were also remarkable. High officals called "devlet erkanı" such as Prime Minister, "Şeyh'ülislam", Navy Commander, Ministers, Minister "Kethuda"s, accountants and lawyers had residences and as many as 200 service personnel such as kethuda, mühürdar (sealer), cook, stableman, boatman, residence keepers and tailors. These service personnel attended to wars and conducted their service during the war. Although this practice was criticized heavily, it was not changed (Aksan, 1997). Wealth of high officers were staggeringly high. When a messenger from India said to Halil Hamid Pasha that they could give five thousand sacks of golden coins to Ottoman Empire in return for helping them, the Pasha said "I and Kaptan Paşa present here alone could give that much". The amount mentioned was about two hundred fifty thousand golden coins.

It is seen that regular payments were done for the central officers until 18<sup>th</sup> century. However, along with the deteriorating financial structure, a "grant based service fee" system was adopted in place of regular salary payment. In this system, the grant received by bureucrats increased as he worked harder and did his job properly (Findley, 1996).

Distinction should be made between two aspects of material award system: first, appointing one or more level above offices in return for the accomplishments and the second giving big bonuses. The former was common and effective in use. This practice continued after Tanzimat, although regulations regarding public officials were subjected to certain rules Ahmet Muhtar Pasha was promoted from colonel to Marshall after his extraordinary success in Yemen only in 9 months. He talks about this: "When the boat which was carring the document showing my promotion and accompanying officers came to Kunfuda and Şakik Edip Efendi and aide of the sultan set out to come near me. However, I had already a herald from Kunfuda, so I was high affected and cried. I was closed up in my tent and did not accept anybody for an hour. The reason not having enough time to think about deserving this duty or not and having enough qualification for this duty. I was scared of being humiliated later. For I was a colonel nine months ago. My brigade and major general period are only nine months. Giving me these three big ranks meant that they expect a lot from me. "Another example of this was promotion of Topal Osman Nuri Paşa from colonel to marshall only in three years.

In the practice, awards called the state awards and promotions were given collectively as well as privately. Collective awards called tip from the Sultan were given during ceremonies for the Sultan's claim of throne and during another celebrations after big military triumphs.Examples of individual awards were decorations of historians appointed by the Sultan to "Divan-1 Humayun" and some other offices. Along with the formal start of the state historian statue in 1700, famous historian Naima was rewarded 500 "guruş-u attiye" and one "guruş" payment rise to his daily wage at customs (İlgürel, 1991). Sometimes there were payments for the officials relieved of the duty in order to prevent them to get offend and to make them feel good about the trust of his service. After Halil Paşa removed from the duty,Sultan Mehmed II (the Conqueror) gave him a village in Filibe Sancak as his own property in order to dispel his doubts and to decorate him (Çarşılı, 1988).

The available documents show that sometimes there were extravagancies in rewarding. For example, after the Crimmean war, the British and French saw that saw that Ottoman gun powder was better than the ones produced in their countries. They offered big rewards to chief of gur powder manufacturing officer Ohannes Dadyan and wanted to bring him to their countries. He turned down their offers and said that "I was born in Ottoman Empire and raised here. I dedicate my life to this country". After heard about it Sultan Abdülmecid donated him a land in Yeşilköy as far as his eyes could see (Pamukciyan, 1958). This land was in the area known Florya today and consisted of 210 pieces of plots, which is almost all of today's Florya. Dadyan's inheritors had disagreements over the land in 1950's and their cases went on for years in courts (Dadyan, 1954).

Warrenties and Eliminating the Concerns for the Future: Incentive and awarding practices applied during the public service continues after termination of the service. Thus, officials conducted their lives without concerns. Besides a pension, the officials could retain all the wealth they accumulated during their service in their retirement. Although in Ottoman Empire only the Sultan could own property."Paşa"s and "Vezir"s also could have properties such as large farms, palaces, residencies, whose incomes completely belong to them. In order to understand the practices on this issue, it is necessary to study Has (big Timars such as latifundia in Rome) concept. Although, "has" term is used for Sultan's property in Great Seljuks, it has a meaning of private property land and "dirlik" which had returns at least 100,000 "akce" in a year was belonged to servants of Sultan and palace officials such as "Bostaniyan-1 hassa", "Doğanciyan-1 hassa", "Mehteran-1 hassa", as well as dynasty members, ministers, beylerbeyis, sancak beyis and accountants. For example, there was a rule regarding the sell of grain from "has" es and farms dated H.945 in Bursa (Gökbilgin, 1988). "Has" es appropriated to "Vezir"s and high officals were abolished year by year and added to "Mir-i Mukataa". After "Tanzimat" the principle of making all expenses through the state treasure was put in practice and this system was cancelled totally after starting regular salary payments.

Divan-I Malikane" (life-long mültezim), a significant type of private property, was also an example of this privileged land property practice. "Malikane" owners had right to sell,donate,establish foundations and leave them to their children when they die (Barkan,1939).Giving to own a property right ,which exclusively belong to Sultan,to the state officals means that officers could demand nothing from the state since they had some privileges of sultan. As a result of having all financial needs that they could dream of the state officials could only focus on their duties.In addition belongings could have been passed to their heirs, so they did not have any concern for the future. Against the danger of confiscation or contraversions among family members, some officials disregarded inheritance rules of Islamic law and established Foundations special their children, so taking guarantee even the future of their children.In practice, in some cases children of some officials were paid salary. There was no doubt that confiscation was the main concern of state officials who had considerable amount of wealth accumulation. "Müsadere" (confiscation) system took its legitimacy since "devşirme"s were in the same statue of slavery, the state had right to take their share of heritage according to Islamic law.Besides, hey had not pay any tax.they had to help the state in hard times just as the Sultans had paid from their own wealth.If all the wealth were confiscated, the state had to pay for the livelihood of statesman's household. There were not any age limitations for statesman. Service was unlimited except for dismissal, dementia and impairment. There was an amount given in cash or dismissed officers called "arpalık".This could be an annual income of a given land or a given sum appropriated from the treasury (Tabakoğlu, 1994).

# Conclusion

Ottoman Empire represents a strong central state tradition and this subject is the source of its economic power. These facts literally show that the state is the source of wealth. The fact that the state was the sole owner of the land restricted the ways of getting rich by trading and working in public service. Strict state control and getting low profit margins made it difficult to be rich through the trade. However, "sahaf"s operating in financial markets and especially later period's non-muslims dealing with trade were exceptions.

On the other hand civil service semms to be the only way of getting rich in Ottoman Empire.Confiscation establishment was one which could eliminate all concerns.The state was not complaining about high officials who were getting rich because it was thought that this wealth belonged to the state.The main reason for a conviction was the fact that statesmans could not leave this wealth to their inheritors.

According to Ottoman political system took its power from economic strength. The state had to be as strong as possible within national borders. The state administration under control of financial system debilitated the state and thus hurt the citizen whose protector is the state. This became apparent with the financial depression happened in the 17<sup>th</sup> century.

Present day situation is no different. In the recent recession, states must reconsider their relationships with financial system and make some reorganizations. It should not be forgotten that 90% of the public revenues come from taxes. Although cooperation with financial quarters can be conceived to the benfit of the states at first, it

will result in drying of tax sources as well as the losses in production strength in long term. The most pressing question to be faced and to be answered is whether it is the state's or the bank's future that is important.

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# Impact of Military Expenditure and Economic Growth on External Debt: New Evidence from a Panel of SAARC Countries

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#### ABSTRACT

This paper examines the impact of military expenditure and economic KEYWORDS growth on external debt for a panel of five selected SAARC countries including Bangladesh, India, Nepal, Pakistan and Srilanka, over the period of 1988-2008. Using Pedroni's (2004) test for panel cointegration, it was Cointegration, SAARC Countries. found that there is a long-run relationship between external debt, economic growth and military expenditure. The study finds that external debt is elastic with respect to military expenditure in the long run and inelastic in the short run. In the long run, 1% increase in military expenditure increase external debt between 1.18 % and 1.24%, while 1% increases in economic growth reduce external debt between 0.64% and 0.79%, by employed DOLS and FMOLS estimator respectively. In the short run, 1% increase in military expenditure increases external debt by 0.15%, while 1% increase in economic growth reduces external debt by 0.47 %.

External Debt, Economic Growth, Military Expenditure, Panel

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### Introduction and Literature Review

The relationship between military expenditure and economic growth has been examined extensively in the literature. However, the effect of military expenditure on external debt has received less attention. In countries with large military expenditure, the role of military spending in contributing to external debt is important because of the potential adverse economic effects of external debt as excessive foreign debt accumulation can cause deterioration in the terms of trade, an overvaluation of the domestic currency and slower economic growth.

Benoit (1973, 1978) in his pioneered study examined the relationship between military expenditure and economic growth in 44 less developed countries and found that there is a positive correlation between military expenditure and economic growth. Dakurah et al. (2000) studied 62 LDCs and found 13 countries showing unidirectional causality from military expenditure to growth; 10 countries from economic growth to military expenditure; 7 countries suggest bidirectional causality and the rest 18 countries displaying no meaningful relationship. Yildirim, Sezgin & Ocal (2005) examined the effect of military expenditure on economic growth for 12 Middle Eastern countries and Turkey using cross-sectional and dynamic panel data estimation techniques from 1989 to 1999 and found that military expenditure enhances economic growth in the Middle Eastern countries and Turkey as a whole. So for as the South Asian Regional Cooperation Council (SAARC) countries are concerned, a study was carried out by Hassan et al. (2003) to show the relationship between military expenditure and economic growth. They examined the impact of the military expenditure on economic growth and FDI covering five out of seven SAARC nations using panel data over the 1980-1999 periods. Interestingly the result suggests positive relationship between military expenditure and economic growth, and thus supporting the view that military expenditure can bring positive impact on growth. Other studies which have also found a positive relationship between military expenditure and economic growth include Mueller and Atesoglu (1993); MacNair et al. (1995), Chlestos and Kollias (1995), Sezgin (1999b, 2000) and Yildirim and Sezgin (2002).

Equally military spending may have a negative effect on economic growth through reducing the availability of public funds for spending in the supposedly more productive civilian sector and creating inflationary pressures. Deger (1986) found negative relationship between military expenditure and growth in the less developed countries citing that defense expenditure takes resources away from productive investments and fails to mobilize and create additional savings. Other empirical studies that found significant adverse effect of defense spending on the economy include studies by Deger and Smith (1983), Deger and Sen (1983) and Faini et al. (1984), Antonakis (1997), Heo (1998), Linden (1992), Dunne and Mohammed (1995), Sezgin (1999a) and Dunne, Nikolaidou & Smith (2002). Aizenman and Glick (2006) studied the long-run impact of military expenditure on growth and suggested that military expenditure induced by rent seeking and corruption should reduce growth. Abu- Bader *et al.* (2003) found that military expenditure had a negative effect on economic growth in Egypt, Israel and Syria over the period 1972 to 2001 within a Granger causality framework. DeRouen (2000) reaches the same findings in a single country study of Israel.

Smyth and Narayan (2009) have examined the relationship between external debt and military expenditure nexus in the six Middle Eastern countries and found that external debt is elastic with respect to military expenditure in the long-run while inelastic in the short-run.

In this paper an analysis has been carried out to find a panel cointegration between external debt and military expenditure along with economic growth in SAARC countries, using secondary data from 1988 to 2008. This paper does not include all dimensions and factors of the external debt and military expenditure problem from an econometric perspective, the small panel (T=19, N=5) is only sufficient to accommodate two explanatory variables without a substantial loss in power.

The objectives of this paper are:

- 1. To empirically investigate the relationship between external debt, economic growth and military expenditure using a panel unit root and panel cointegration framework in selected SAARC countries.
- 2. To empirically investigate, whether there is a long-run or short-term relationship between the external debt, economic growth, and military expenditure.

This paper is organized as: after introduction and literature review above, a brief overview of external debt, economic growth and military expenditure of the selected SAARC countries is given followed by data source and methodological framework. Next results and discussion has been carried out and conclusion of the study is given at the end.

# Overview of External Debt, Economic Growth, and Military Expenditure in the Selected SAARC Countries

*External Debt:* Debt service liability as percentage of export of goods and services has decreased considerably in all the Member States of SAARC countries. In Bangladesh and India debt service liability has been reduced from 25.8 percent and 31.9 percent in 1990 to 3.7 percent and 7.7 percent in 2006 respectively. Pakistan and Sri Lanka have witnessed decline from 22.9 percent and 13.8 percent in 1990 to 8.6 percent and 12.7 percent in 2006 respectively. Figure 1 below shows the trend.

Figure 1. External Debt in SAARC Region (1988-2008)



Sources: Asian Development Bank, 2008; World Banks, 2008.

*Economic Growth:* SAARC member states have maintained GDP growth rate in 2006 at 8.9%. GDP growth in South Asia is significantly higher compared with other developing regions. However, trickle down effects of growth would take time to effect the population of the region. Real GDP growth rate has increased in almost all the countries. Country-wise analysis shows that Bangladesh's real GDP growth at 6.2 percent in 1990 increased to 6.6 percent in 2006. Bhutan during the period 1990-2006 witnessed sharp increase from 5.6 percent to 7.8 percent. India maintained its growth momentum from 5.6 percent in 1990 to 9.6 percent in 2006. Nepal economy has witnessed low and high GDP growth from 2.3 percent in 2005 to 2.8 percent in 2006. Pakistan was maintaining its growth but has witnessed a low growth rate of 5.8 percent in 2006. Sri Lankan economy has showed an increase 7.7 percent in 2006 (see, SHRDC, 2008). Figure 2 below shows the trend.

Figure 2. Economic Growth of SAARC Countries (1988-2008)



Source: Human Development Report 2007-08; UNDP, 2008.

*Military Expenditure:* An increasing trend has been noticed in military expenditures over the time period. Pakistan and India are in the competitive zone, therefore, both have increased their military expenditure. In terms of military expenditure as percentage of GDP, Sri Lanka spent 4.1%, Pakistan 3.5%, India and Nepal 2.5%, Bangladesh 1.5%. Figure 3 shows individual country assessment of military expenditures over a time period.

Figure 3. Military Expenditure in SAARC Region (1988-2008)



Source: UNDP, 2008 and Human Development Report 2007-08.

# Data Source and Methodological Framework

The data set for five SAARC countries is collected from International Financial Statistics (IFS, 2008), World Bank (2008), SHRDC report, (SHRDC, 2008); Stockholm International Peace Research Institute (SIPRI, 2008) and Economic Survey of Pakistan (2008-09). The dependent and independent variables used in this study are listed in Table 1. External Debt is used as a dependent variable for the study. Independent variables are Economic Growth (GDP) and Military Expenditures (ME).

Table 1. Variables used for the External debt-Military expenditure Model

Variables	Symbol	Expected Sign
Dependent Variable:		
External Debt	ED	
Independent Variable:		
Economic Growth	GDP	Negative
Military Expenditure	ME	Positive

*Panel Econometric Model:* There is lack of panel cointegration to explain the relationship between external debt and military expenditure in the SAARC context. This paper uses panel cointegration analysis to test this relationship in Bangladesh, India, Nepal, Pakistan and Sri Lanka during 1988-2008. The model used to test the relationship between external debt and military expenditure is as follows:

# ln(ED) = f ln(GDP, ME)

The general representation of the equation mentioned above is as follows:

$$Log(Y_t) = C + \beta_{1t} \log(X_{1t}) + \beta_{2t} \log(X_{2t}) + \varepsilon_t$$
(1)

#### Where:

 $Y_t$ dependent variable; = С intercept; =  $\beta_t$ slope of the independent variables; = independent variables (GDP and ME) X = Т 1, 2...21 periods; = 1, 2...5 countries; =  $\mathcal{E}_{t}$ error term; =  $\beta_1$ coefficient of economic growth; = B coefficient of military expenditure; =

In the above model, the sign of  $\beta_1$  is expected to be negative as it is argued that SAARC countries might have a capacity to repay external debt. Similarly,  $\beta_2$  is hypothesized to be positive as it is argued that large military expenditure can result in large external debt.

This paper uses a panel cointegration method to examine the long-run relationship between external debt and military expenditure in the selected SAARC countries. Thus, three different panel unit roots tests [(i.e. Levin-Lin- Chu (LLC) test, Im-Pesaran-Shin (IPS) test and Maddala-Wu (MW) test)] have been used in this study.

**Panel Unit Root Tests:** Panel unit root tests could be considered as an extension of the univariate unit root test. The LLC test is based on the pooled panel data as follows (Levin & Lin, 1992);

$$\Delta y_i = \rho y_{i-1} + \alpha_0 + \sigma_i + \sigma_i + \theta_i + \varepsilon_i \tag{2}$$

Where  $\rho, \alpha_0, \sigma$  are coefficients,  $\alpha_i$  is individual specific effect,  $\theta_i$  is time specific effect.

According to Levin & Lin (1992), the LLC test could be conducted by the following steps. In step1, subtract the cross-section average from data;

$$\overline{y} = 1/N \sum_{i=1}^{N} y_i \tag{3}$$

In step 2, an ADF test is applied to each individual series and normalizes the disturbance. The ADF model could be expressed as;

$$\Delta y_{i} = \rho_{i} y_{i-1} + \sum_{j=1}^{P_{i}} \delta_{j} \Delta y_{i,t-j} + \alpha_{i} + \varepsilon_{i}$$

Maddala and Wu (1999) argued that this is equivalent to perform two auxiliary regressions of  $\Delta y_i$  and  $y_{i,t-1}$  on the remaining variable n equation (3). Let the residuals from these two regression be  $\hat{e}_{i,t}$  and  $\hat{V}_{i,t-1}$  respectively. The, regress  $\hat{e}_{i,t}$  on  $\hat{V}_{i,t-1}$ .

$$\hat{e}_{i,t} = \rho_i \hat{V}_{i,t-1} + \varepsilon_t \tag{5}$$

Levin & Lin (1992) suggest the following normalization to control the Heteroskedasticity in error.

$$\hat{\sigma}^{2}{}_{\acute{e}} = \frac{1}{T - P_{i} - 1} \sum_{t=p+2} (\hat{e}_{i,t} - \hat{\rho}_{i} - \hat{V}_{i,t-1})^{2}$$
$$\widetilde{e} = \frac{\hat{e}_{i,t}}{\hat{\sigma}_{\acute{e}}}$$
$$\widetilde{v}_{i,t-1} = \frac{\widetilde{v}_{i,t-1}}{\hat{\sigma}_{\acute{e}}}$$

In the next step, the LLC test statistic could be obtained from the following regression;

$$\widetilde{e}_{i,t} = \rho \widetilde{v}_{i,t-1} + \widetilde{\varepsilon}_{i,t}$$

The t-statistic for testing  $\tilde{o} = 0$  is given by

$$t_{\delta} = \frac{\hat{\delta}}{STD(\hat{\delta})}$$

Where

$$\hat{\delta} = \frac{\sum_{i=1}^{N} \sum_{t=2+p}^{T} \hat{v}_{t-1} \hat{e}_{i}}{\sum_{i=1}^{N} \sum_{t=2+p} \hat{v}_{i-1}^{2}}$$

Next, the paper also employs the IPS test which is based on the mean value of individual ADF statistics or *t*-bar (Im, Pesaran and Shin, 2003). The IPS test provides separate estimation for each *i* section, allowing different specifications of the parametric values, the residual variance and the lag lengths. Their model is given by:

$$\Delta Y_{i,t} = \alpha_i + \rho_i Y_{i,t-1} + \sum_{k=1}^n \phi_k \Delta Y_{i,t-k} + \delta_i t + u_i$$
(6)

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(4)

The null hypothesis and the alternative hypothesis are formulated as:

$$H_0: \rho_i = 0$$
$$H_A: \rho_i < 0$$

for at least one *i* 

Thus, the null hypothesis of this test is that all series are non-stationary process under the alternative that fraction of the series in the panel are assumed to be stationary. IPS also suggested a group mean Lagrange multiplier test for testing panel unit roots.

Maddala & Wu (1999) attempted to improve to the same degree the drawbacks of all previous tests by proposing a model that could also be estimates with unbalanced panels. Basically, Maddala and Wu are in line with the assumptions that a heterogeneous alternative is preferable, but they disagree with the use of the average ADF statistics by arguing that it is not the most effective way of evaluating stationary.

Panel Cointegration Tests: Finally, this paper employs Pedroni's (1999, 2004) panel-co integration method in order to examine the long-run relationship between external debt and military expenditure. If the independent and dependent variables are co-integrated or have a long-run relationship, the residual  $e_{i}$  will be integrated of order zero, denoted I(0). Pedroni used two types of panel cointegration tests. The first is the "panel statistic" that is equivalent to a unit root statistic against the homogenous alternative; the second is the "group mean statistic" that is analogous to the panel unit root test against the heterogeneous alternative. Pedroni (2004) argued that the "panel statistic" can be constructed by taking the ratio of the sum of the numerators and the sum of the denominators of the analogous conventional time series statistics. The "group mean statistic" can be constructed by first computing the ratio corresponding to the conventional time series statistics, and then computing the standardized sum of the entire ratio over the N dimension of the panel. This paper uses two panel co-integration tests as suggested by Pedroni (1999, 2004), namely the "panel ADF statistic" and "group mean ADF statistic". The two versions of the ADF statistics could be defined as:

 $Z_{t} = \left(\tilde{s}_{NT}^{2} \sum_{i=1}^{N} \sum_{t=1}^{T} \hat{e}^{2}_{i,t-1}\right)^{-1/2} \sum_{i=1}^{N} \sum_{t=1}^{T} \hat{e}_{i,t-1} \Delta \hat{e}_{I,T}$ 

 $N^{-1/2} Z_T = N^{-1/2} \sum_{i=1}^{N} (\sum_{t=1}^{T} \hat{s}_i \hat{e}_{i,t-1}^2)^{-1/2} \sum_{t=1}^{T} \hat{e}_{i,t-1} \Delta \hat{e}_{i,t}$ (8)

Panel

Group Mean

Where  $\hat{e}_{i,t}$  represents the residuals from the ADF estimation,  $\tilde{s}_{M}$  is the contemporaneous panel variance estimator, and  $\hat{s}_{i}$  is the standard contemporaneous variance of the residuals from the ADF regression. The asymptotic distribution of panel and group mean statistics can be expressed in:

$$\frac{K_{N,T} - \mu \sqrt{N}}{\sqrt{\nu}} \Rightarrow N(0,1)$$

Where  $K_{N,T}$  is the appropriately standardized form for each of statistics,  $\mu$  m ADF regression is the mean term and v is the variance adjustment term. Pedroni provides Monte Carlo estimates of  $\mu$  and v (Pedroni, 1999).

These statistics are based on the estimated residuals from the following regression:

$$\ln(ED)_{i,t} = v_i + \mathcal{G}_i \ln(GDP)_{i,t} + \mathcal{S}_i \ln(ME)_{i,t} + \xi_{i,t}$$

Where  $\xi_i = \eta_i \xi_{i(t-1)} + \mu_i$  are the estimated residuals from the panel regression. The null hypothesis tested is whether  $\eta_i$  unity is. The finite sample distribution for the test statistics have been tabulated in Pedroni (2004) using Monte Carlo simulations, if the test statistic exceeds the critical values in Pedroni (2004), the null hypothesis of no cointegration is rejected, implying the variables are cointegrated.

**Panel Long-run Relationship:** If long-run relationship among the variables were found then the long-run and short-run coefficients of economic growth and military expenditure on external debt will be estimated. To estimate the long-run effect of economic growth and military expenditure, the panel FMOLS, proposed by Pedroni (2000) and DOLS developed by Stock and Watson (1993) have been used.

# **Results and Discussion**

To test whether each of ED, GDP and ME contain a panel unit root, the panel unit root tests proposed by Levin, Lin and Chu Test (2002), Im, Pesaran & Shin (2003) and Maddala & Wu (1999) have been applied. The results are reported in Table 2 where they are divided into three panels. Panel A consists of results from the Levin, Lin and Chu (2002); panel B consists of the results from the Im, Pesaran & Shin (2003) test and panel C consists of results from the Maddala and Wu (1999) test. For each of these tests, \*, \*\* and \*\*\* indicates the statistical significance at 1

(7)

percent; 5 percent and 10 percent respectively. The results from all three tests, with or without linear trends; suggest that ED, GDP and ME contain a panel unit root as mentioned in Table 2.

# Table 2. Panel Unit Root Test

	Levels		First Differences	
	Individual Efforts	Individual Effects	Individual Effects	Individual Effects
	Individual Effects	and Linear Trends	inuiviuuai Enects	and Linear Trends
Panel A: Levin, Lin, Chu	Test (2002)			
Variables (in logs)				
In(ED)	2.807	2.118	-1.400***	-1.580***
In(GDP)	2.448	1.725	-1.621**	-1.812**
In(ME)	-0.432	0.022	-4.294*	-3.827*
Panel B: Im, Pesaran, Sh	in Test (2003)			
Variables (in logs)				
ln(ED)	3.664	2.712	-1.815**	-2.495*
In(GDP)	-0.846	0.356	-3.586*	-3.201*
In(ME)	-0.071	0.352	-3.256*	-2.665*
Panel C: Maddala and V	Vu (1999)			
Variables (in logs)				
In(ED)	0.015	1.985	20.712**	21.321**
In(GDP)	12.285	8.253	38.361*	32.170*
In(ME)	10.234	6.213	29.665*	27.424*

\* indicates significance at the 0.01 level.

\*\* Indicates significance at the 0.05 level.

To examine whether there is a long run relationship between the three variables for the panel of five selected SAARC countries, Pedroni's (2004) panel Phillips-Perron (1988) type rho-statistic and group Phillips-Perron (1988) type rho-statistic have been employed. The panel rho-statistic and group rho-statistic are 2.2 and 2.7, respectively and the associated one-sided p-value is less than 0.01. Thus, both test statistics suggest that there is panel cointegration between ED, GDP and ME at the 1% level of significance.

After finding that a long-run relationship exists between ED, GDP and ME, the long-run effect of GDP and ME on ED have been estimated using the panel FMOLS estimator suggested by Pedroni (2000) and panel DOLS estimator proposed by Kao & Chiang (2000). The results are reported in Table 3.

# Table 3. Panel Long-run Elasticity

Panel Methods	ln(ME)	ln(GDP)
DOLS	1.182	-0.638
	(8.337)*	(-11.783)*
FMOLS	1.243	-0.796
	(3.210)*	(-3.974)*

Note: Figures in parenthesis are t-statistics. \* denote statistical significance at the 1 % level.

For the DOLS estimator, 1% increase in economic growth decreases external debt by 0.638 %, while a 1% increase in military expenditure increases external debt by 1.18%. Both results are statistically significant at the 1% level. On the other hand, for the FMOLS estimator the coefficient on GDP is 0.796, suggesting that a 1% increase in growth (GDP) decreases external debt by 0.80%. The coefficient of military expenditure (ME) is 1.243, which implies that a 1% increase in military expenditure increases external debt by almost 1.24%.

The results for the short-run impact of economic growth and military expenditure on external debt for the panel of five selected SAARC countries are reported in Table 4.

Table 4. Panel Short-run Elasticities

Variables	Coefficient	t-statistics
Constant	9.452	19.528*
$\Delta_{ m In(ME)}$	0.149	6.102*
$\Delta_{In(GDP)}$	-0.471	-3.761*
$ECT_{t-1}$	-0.092	-2.183**
Goodness of fit: $R^2 = 0.84$ ; $\overline{R}^2 = 0.81$		

Note: \*, \*\* and \*\*\* denotes statistical significance at 1, 5 and 10 % level.

Table 4 indicates that economic growth has a negative impact on external debt while military expenditure has a statistically significant positive impact on external debt in the short-run. The coefficient of the military expenditure is 0.149, suggesting that a 1% increase in military expenditure increases external debt by 0.15% respectively. On the other hand, GDP decreases external debt by almost 0.47%. The one period lagged error correction term, which measures the speed of adjustment to equilibri-
um following a shock to the system, has a negative sign and is statistically significant at the 5% level. Its sign and significance level suggests that external debt is able to revert to its equilibrium following a shock to growth and military expenditure. But, the magnitude of the coefficient, because it is very small, suggests that the speed of adjustment to equilibrium is very slow.

Overall military expenditure has a positive and significant impact on SAARC external debt in the short and long-run. The relationship is elastic in the long-run, but inelastic in the short-run.

# Conclusion

In this paper a short term and long term impact of military expenditure and economic growth the external debt for five selected SAARC countries; namely, Bangladesh, India, Nepal, Pakistan and Sri Lanka has been examined using data for the period 1988-2008 by applying panel unit root and panel cointegration framework. It was found that the external debt, economic growth and military expenditure were cointegrated for the panel of five SAARC countries. In the long-run, both estimators (DOLS and FMOLS) suggest that economics growth has a statistically significant negative effect on external debt, while military expenditure has a statistically significant positive effect on external debt. Using DOLS estimator, it was found that 1% increase in economic growth decreases external debt by 0.638 %, while a 1% increase in military expenditure increases external debt by 1.18%. Both results are statistically significant at the 1% level. On the other hand, using FMOLS estimator, it was found that 1% increase in growth (GDP) decreases external debt by 0.796%. While 1% increase in military expenditure increases external debt by almost 1.24%.

In the short-run it was found that economic growth and military expenditures have a statistically significant negative and positive effect on external debt. In short run it was found that 1% increase in military expenditure increases external debt by 0.15% while 1% increases growth (GDP) decreases external debt by almost 0.47%.

One important limitation on our finding is that, from an econometric perspective, the small panel (T=21, N=5) is only sufficient to accommodate two explanatory variables without a substantial loss in power. Future studies for the South Asia as well as other regions in the world could include more potential determinants of external debt within a panel cointegration framework subject to an increase in data availability.

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# Government Expenditure on Nomadic Education in Nigeria: Implications for Achieving the Millennium Development Goals

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#### ABSTRACT

#### The paper examines government expenditure on nomadic education in Nigeria and the implications for achieving the MDGs. Secondary data were used and the data were analyzed with the aid of descriptive statistics. The study revealed that government expenditure on nomadic education in Nigeria over time has been on the increase which has necessitated the Nigeria. increase in the number of nomadic schools and teachers in the country. The study further found out that there is a wide gap between male and female enrolments in nomadic schools in Nigeria; factors such as early marriages and teenage pregnancies, cultural and religious biases as well as economic issues were believed to be responsible for the gap. Also, it was discovered that the total increase in nomads' enrolments in nomadic schools in the country is not proportionate with the increase in government expenditure on nomadic education. The study attributed this low school attendance by the nomads to the problems of under-funding, dearth of teachers, constant migration of nomads, the involvement of the children of nomads in the productive system, corruption, among others. The study concluded that the present form of implementation of the nomadic education would make it difficult for it to be a panacea for achieving the MDGs in the country. Recommendations were made on how to improve on the nomadic education system in the country.

#### KEYWORDS

Education, Government Expenditure, Millennium Development Goals, Nomads, Nigeria.

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#### Introduction

Education is the spring board for social and economic change. It plays a major role in the socio-economic development of a nation. Education occupies an important place in most plans for economic and social development. It is important in the human development as a supplier of the trained man power as well as a requisite for the accomplishment of other development goals (Adebiye,2004). These roles played by the educational sector stimulate economic growth and development of a country. This explains why countries of the world expend so much on this vital sector in order to enhance the level of literacy of their citizenry. Inequality of access to education and educational marginalization have deleterious effects on the national development of a country. In Nigeria, however, available records have shown that expenditure on education is below the internationally acceptable standard. According to the UNDP Human Development Report (2008), Nigeria spends almost an insignificant proportion of its financial resources on education, the expenditure on education in Nigeria as a proportion of GDP averaged 5.84 percent, which falls below the UNESCO's benchmark of 26 percent of the budgets of developing countries. This accounts for the sluggish educational growth rate of 0.59 in the country. The poor funding of education in Nigeria has over time deprived a lot of Nigerians access to education. According to Nafisatu and Abdu (2010), out of the estimated population of 9.4 million nomads in Nigeria, 3.3 million are children of school age, but the participation of the nomads in the existing formal and non-formal education programs is abysmally low, with a literacy rate ranging between 0.2% and 2.9%. The Nigerian nomadic pastoralists are made up of the Fulani (5.3m), Shuwa (1.01m), Koyam (32,000), Badai (20,000), Dark Buzzu (15,000) and the Buduma (10,000). The Fulani are found in 31 out of the 36 states of Nigeria, while others reside mainly on the Borno plains and shores of Lake Chad. The migrant fishing groups account for about 2.8 million, comprising numerous tribes. They are found in the Atlantic coastline, the riverside areas and river basins of the country. These groups of people amongst others do not have access to functional education in the country over time. In the quest to remove the chronic illiteracy among this mobile population of Nigeria, the federal government of Nigeria introduced Nomadic Education Program (NEP) in 1986. NEP was designed to provide the nomads with the relevant and fundamental basic education that would improve their survival skills. This was expected to provide them with the knowledge and the skills that would enable them raise their productivity and income; as well as empower them to participate effectively in the socio-economic and political affairs of the country. In a bid to achieving these goals,

the National Commission for Nomadic Education (NCNE) was established in 1989 with the mandate to: a) formulate policies and guidelines on all matters relating to nomadic education in Nigeria; b) provide funds for research and personnel development for the improvement of nomadic education; and develop programs on nomadic education and provide equipment, instructional materials, construction of classrooms and other facilities for nomadic education (Nafisatu and Bashir,2010).

Over the years, the government has been spending money on the nomadic education program so as to provide an unfettered access to quality basic education for the nomads. The aim is to equip them with the skills and competencies that will enhance their wellbeing and participation in the nation-building process. The Nigerian government considers nomadic education as a veritable measure for the development of the universal basic education with a view to achieving the Education for All (EFA) goals and the Millennium Development Goals (National Commission for Nomadic Education, 2002). An assessment of the results of the program against its objectives thus far is imperative. Government expenditure on education in Nigeria has been widely studied. However, attention has not been paid specifically on assessing the impact of government expenditure on nomadic education as a measure aimed at achieving the MDGs of universal basic education in Nigeria. At best, available literature presents partial analyses of this issue. Thus, to be area specific, this paper seeks to evaluate the impact of government expenditure on nomadic education in Nigeria with a view to ascertaining whether or not, it will be the key for achieving the universal basic education of MDGs in Nigeria. Following the introduction, the paper is structured as follows: Section two deals with the review of government expenditure on education in Nigeria and the outline of the MDGs. Section three considers the evolution and strategies of nomadic in Nigeria; while section four presents the problems of nomadic education in Nigeria. Section five is the method of the study; section six presents and analyses the data. Section seven uncovers the findings of the study; and section eight contains the recommendations and conclusion of the paper.

#### Government Expenditure on Education in Nigeria

Government funding of education in Nigeria comes from different sources. The major one for all levels of government is the public revenue from taxation and oil (Saavedrea, 2003). Education funds are reported to be distributed among the primary, secondary and tertiary education levels in the proportion of 30%, 30% and 40%, respectively (Balami ,2003). According to Hinclifte (2003) (as cited in Adewale, Ajaji and Enikanoselu, 2005), Government expenditure on education includes direct government expenditure ( for teachers' salaries and instructional materials) as well as indirect expenditure in the form of subsidies to households such as tax reductions, scholarships, loans and grants. It also includes payment from Education Tax Fund (ETF), mainly for capital expenditure. The main sources of funds that the Nigerian government has are federal taxes and duties on petroleum, profits, imports and exports, which form the revenue of the Federation Account, and the centrally collected Value Added Tax (VAT) introduced in 1996. The federal government allocations to the educational sector from 1995 to 2011 is presented in Table 1.

Table1. Federal Government Allocation to Education between 1995-2011

Years	Capital (N)	Recurrent (N)	Total ( N)
1995	3,017,900,000	9,798,600,000	12,816,400,000
1996	3,215,800,000	12,135,900,000	15,351,700,000
1997	3,807,900,000	13,033,200,000	16,841,200,000
1998	9,739,600,000	13,828,300,000	23,666,100,000
1999	8,291,800,000	19,421,700,000	27,713,500,000
2000	35,000,000,000	29,514,932,711	64,514,932,711
2001	35,183,789,000	37,676,055,443	72,950,836,443
2002	22,100,000,000	59,994,441,815	82,094,441,815
2003	15,723,260,401	63,228,742,652	78,952,003,053
2004	21,550,000,000	72,217,886,839	93,767,886,839
2008	50,540,287,898	145,219,839,130	195,760,127,029
2009	40,005,096,425	196,218,973,905	236,224,070,330
2010	53,667,933,553	192,594,871,801	246,262,805,354
2011	304,670,538,799	518,251,289,348	356,495,828,145

Source: Budget Office of the Federation, Federal Ministry of Finance, 2011.

The table above shows that government expenditure on education consists of recurrent and capital expenditure. In nominal terms, it can be seen from the table that the budgetary allocations to the education sector are on the increase but the growth rate is not impressive. For instance, in 2008 the allocation to the capital expenditure on education was 6.4% of the total budget and it was 3.9% in 2009, and 3.9% in 2010 representing 0.0% increase between 2009 and 2010; while the educational allocation to the recurrent expenditure was 15.1% in 2008,15.0% in 2009, and 14.4% of the total budget in 2010. This represents a decline of -0.6% in the allocations between 2009 and 2010. These allocations have grossly failed to meet the UNESCO's conventional benchmark of 26% for the budgets of developing countries. Given the importance of this sector to human and economic development, it would be important to push the education allocations up to at least half of the international benchmark requirement so as to attain the universal basic education as described in the goal two of the Millennium Development Goals (MDGs).

# Outline of the Millennium Development Goals(MDGs)

At the Millennium Summit held in September 2000, in New York, United States of America, members of the United Nations (UN) made the following declaration: We will spare no effort to free our fellow men, women and children from the abject and dehumanizing conditions of extreme poverty, to which more than a billion of them are currently subjected to". This led to the acceptance and the formulation of the Millennium Development Goals which are expected to be fully achievable in the year 2015. These goals are:

Goal 1: Eradication of extreme poverty and hunger by half in 2015;

Goal 2: Achievement of the universal primary education by 2015;

**Goal 3:** Promotion of gender equality and empowerment of women by 2015; **Goal 4:** Reduction of child mortality rate especially the under 5 by two-third in

2015,

**Goal 5:** Improvement of the maternal health;

Goal 6: Combat HIV/AIDS, malaria and other diseases;

Goal 7: Ensure environmental sustainability; and

**Goal 8:** Development of a global partnership for development (National Planning Commission, 2004).

The quest to achieve the universal basic education as described by goal two of the MDGs, the Nigerian government gave a rekindling interest to the Nomadic Education Program as one of the measures of achieving the MDGs in the country by 2015.

# Evolution and Strategies of Nomadic Education in Nigeria.

The Nomadic Education program (NEP) started officially in November 1986, after The Yola National Workshop on Nomadic Education. The workshop resolved that : "... The nomads needed a fair deal through the provision of education and other social amenities to reciprocate their contribution to the nation-building ...." (Ismail, 2000). Consequently, the Federal Government promulgated the Decree No. 41 of December 1989 (now CAP 243 LFN), which established the National commission for Nomadic Education (NCNE) with the responsibility to implement the National Nomadic Education Program. The NCNE was mandated to formulate policy and issue guidelines in all matters relating to nomadic education in Nigeria.

These mandates include: providing funds for research and personnel development of nomadic education in Nigeria; the development of programs on nomadic education; the provision of equipment and other instructional materials, construction of classrooms and other facilities relating to nomadic education. Secondly, to establish, manage and maintain primary schools in the settlements and grazing reserves carved out for nomadic people. Thirdly, to determine standard of skills to be attained in the nomadic schools. Also, to arrange for effective monitoring and evaluation of activities of agencies concerned with nomadic education. It was mandated to liaise and cooperate with other relevant ministries and agencies. Furthermore, NCNE was to receive block grants and funds from the Federal Government or any agency authorized and allocate same to the nomadic schools based on any format approved by the Federal Executive Council; act as agency for channeling all external aid to the nomadic schools in Nigeria; ensure effective inspection of nomadic education activities in Nigeria through the sections in the Federal and State Ministries of Education performing duties relating to nomadic education. Finally, it was mandated to collate, analyze and publish information relating to nomadic education in Nigeria; and undertake any other action desirable for the promotion of nomadic education in Nigeria (National Commission for Nomadic Education, 1989).

The commission has four departments, namely, Program Development and Extension; Monitoring, Evaluation and Statistics; Administration and Supplies and Finance and Accounts. It has six Zonal offices located in Bauchi for the North-East, Kano for the North-West, Minna for the North-Central, Ibadan for South-West, Enugu of the South-East and Benin for the South-South. Furthermore, it has four university-based nomadic education centers located in the University of Port Harcourt for migrant fishermen education, University of Maiduguri for teacher-training, University of Sokoto for curriculum development, and University of Jos for research and evaluation to cater for pastoral nomads (National Commission Nomadic Education, 2000). The Organogram of the Commission is shown in Appendix I.

#### Nomadic Education Program Strategies

In pursuance of its functions, the National Commission for Nomadic Education has between 1990 and 2006 evolved four distinct programs for the effective implementation of the nomadic education program. The programs briefly highlighted are: *Provision of primary education* – this program is implemented in collaboration with States and Local governments, as well as local communities, Non-Governmental Organizations (NGOs) and Collaborative Body Organizations (CBOs). So far, all the 36 States and Abuja are participating in the program. However, their level of commitments to the program varies.

*Provision of academic support services through the University based centers.* The centre at Jos is responsible for research and evaluation, the University of Maiduguri for teachers training and outreach programs, Usmanu Dan Fodiyo University for the development of curricula and textual materials and the University of Port Harcourt for research, curricula development and teachers training for the education of migrant fishing communities. The Commission has been working closely with the Centers for the development of curricula materials and pupils' texts, conduct of research projects and the organization of teachers training workshops;

Provision of infrastructural facilities - faced with the problem of inadequate infrastructure that has necessitated teaching and learning under trees, the Commission has adopted the following strategies for addressing the peculiar needs of all the groups: provision of permanent and semi-permanent structures, provision of mobile collapsible classroom structures, provision of boat schools and dug-out canoes. Provision of extension services: Actual intervention by the Commission in the provision of educational extension services to the nomads only began in 1996/97. The major driving force behind the NCNE's intervention in this aspect of education was the realization that, the adoption of an integrated approach to education provision engender nomads participation in support for the program. However, the mandate of the Commission specifically restricted its operation to the provision of primary education to the children of the nomads. The dilemma necessitated the convening of an Experts Meeting on viable strategies for implementing Nomadic Education in Nigeria in 1995. Having examined the condition of nomadic education in Nigeria, the meeting came out with recommendations to further strengthen, expand and sustain the program. Some of the recommendations were that, the provision of education should be for the children as well as the adults, and that tremendous efforts be made to positively alter the behaviour of nomads towards modern education.

#### **Current Program Implementation**

To support effective teaching and learning, the Commission also collaborates with Nomadic communities, CBOs, NGOs, at all levels, development partners and other

international support organizations. Over the years, the Commission has embarked on a number of activities and recorded modest achievements in the following areas, namely: Broadening access to basic education – providing access to basic education, the NEP has facilitated 2,354 schools in 36 States and FCT for pastoralist children (432,411), 451 for fisher folk children (88,288) in 9 states, 260 schools for migrant farmers in 8 states with 33,164 pupils; The Commission has facilitated the increase in the number of nomadic schools. The number of Nomadic schools increased from 2,094 in 2005 to 2,294 in 2006 and to 2,526 in 2007. There was progressive teachers recruitment and retention in nomadic schools, there was an increase in the number of nomadic schools teachers from 6,918 in 2005, to 7,989 in 2006 and 8,665 by 2007; there was an increase in Nomadic girl-child education initiative of the Commission which has increased female enrolment, progression, and transition in Nomadic schools. The female enrolment has increased from 153,489 in 2006 to 164,769 in 2007 representing 28% increase rate (Nafisatu and Abdu, 2010).

#### Problems of Nomadic Education in Nigeria

According to Nafisatu and Abdu (2010), the following are the problems militating against the smooth operation of the NEP in Nigeria: constant migration of the nomads, the involvement of children in the productive systems, unsuitability of the formal school curriculum, physical isolation and restriction of the nomads from social interaction with the larger society, unfavorable land tenure system, underfunding of nomadic education and late release of approved funds, unwillingness of State and Local Governments to make budgetary allocations for Nomadic Education Program, indiscriminate transfers of the teachers by LGEAs from the Nomadic primary schools to conventional primary schools without replacements, the dearth of teachers in terms of quantity and quality, relatively low level of enrolments in Nomadic schools, general lack of supervision and monitoring of nomadic schools by the local and state governments, relative exclusion of Nomadic schools from UBE and other intervention funds accruing to the States, Non-provision of funds for the Commission's extension service programs, constant clashes and conflicts between farmers and herders and amongst fisher folks over fishing rights resulting in displacements. According to Ismail (2000), the under-funding of nomadic education is partly blamed on inaccurate demographic data. Lack of reliable statistics on the nomads leads to planning based on guessing; there was much confusion as to the actual number of the nomadic schools, types of school facilities and the number of teachers in various locations. Lack of authentic data in these areas has made planning for nomadic education very difficult. Schools are stationed inappropriately; few in densely populated areas, and many in sparsely populated areas. Malinga (2009), observed that, the major hindrances to school attendance are the daily grazing movements and the lack of labor substitutes. Unlike farmers who use child labor marginally, the Fulani rely heavily and continuously on the children for labor. A Fulani man will not send his child to school even if an adult is available to attend to the animals because the child needs to learn the herding skills. The reliance on juveniles for shepherding task, explains the poor participation of the pastoralists in formal education.

From the foregoing, it is apparent that Nafisatu and Abdu, Ismail, and Malinga have identified various problems of nomadic education in Nigeria. However, in this study, the problem of underfunding of nomadic education, dearth of teachers in terms of quantity and quality, corruption, constant migration of the nomads, and active involvement of the school-going age children of the nomads in the productive system were ranked as the most important problems. Thus, these problems were critically engaged in the section of data analysis.

# Method of the Study

The study used mainly secondary data that were obtained from the National Commission on Nomadic Education (NCNE) and the Federal Ministry of Finance as well as journals. The data collected were on the number of pupils enrolment, number of nomadic primary schools, number of teachers in nomadic schools and government expenditure on nomadic education in Nigeria from 1990 to 2008 as well as the corruption perceptions indices in Nigeria. The data were analyzed using tables, percentages, trend graphs, bar charts and rates.

# Data presentation and Analysis

In order to evaluate the impact of government expenditure on nomadic education in Nigeria, data were collected on the number of schools, teachers and the pupils' enrolments in nomadic schools from 1990 to 2008 as presented in table 2. Table 2. Distribution of the of nomadic schools, Teachers and Pupils enrolment from 1990 to 2008

	No of	No of	Pupils e	Pupils enrolment		
Yea	rs schools	teachers	Male	Female	Total	
1990	329	878	13,763	5,068	18,831	
1991	473	1,489	25,942	10,559	65,019	
1992	626	2,491	33,463	16,689	50,152	
1993	656	2,365	38,335	15,253	53,588	
1994	754	2,822	42,738	19,094	61,832	
1995	860	2,788	56,759	35,751	92,510	
1996	940	2,915	63,638	40,938	104,576	
1997	1,103	3,265	71,695	47,081	118,776	
1998	1,022	3,265	69,578	47,366	116,944	
1999	1,068	3,365	75,601	46,934	122,535	
2000	1,494	4,748	112,958	80,291	193,243	
2001	1,574	4,907	118,905	84,939	203,844	
2002	1,680	5,290	134,930	92,014	226,944	
2003	1,820	6,306	175,962	127,556	303,518	
2004	1,981	6,861	211,931	151,622	363,553	
2005	2,034	6,918	222,061	153,489	375,550	
2006	2,354	7,989	224,304	164,769	389,073	
2007	2,354	7,989	224,304	164,769	389,073	
2008	2,526	8,665	235,064	197,347	432,411	
0	NONTE 2000					

Source: NCNE, 2008

The table reveals that the number of nomadic schools in the country has increased from 329 in 1990 to 2,526 in 2008 representing a cumulative increase of 87% in the number of nomadic schools. It further shows that, the number of teachers employed to handle teaching and learning in the nomadic schools has increased from 878 in 1990 to 8,665 in 2008 representing 90% increment in the number of teachers employed during the period. The table also depicts that the number of pupils' enrolment in nomadic schools rose from 18,831 in 1990 to 432,411 in 2008, representing a cumulative increase of 96% in the total pupils' enrolment over the period. To show clearly these increasing trends, data from table 2 were used to construct trend graphs as shown in Figures 1 and 2.

The trends show clearly that both the number of nomadic schools and teachers have increased over time in Nigeria. The main reason for the trend may be the government's continued grant-in-aid to the nomadic education.



Figure 1 Trends of the number of Nomadic schools and the number of Teachers employed over time

The chart in Figure 2 further shows that the number of pupils' enrolment by gender in nomadic education in Nigeria is on the increase.



Source: Constructed from the data in table 2

#### Figure 2. Pupils' enrolments in Nomadic school by gender

A close examination of the chart reveals that there is a wide gap between male and female enrolments over the years. In a bid to explain the gender gap in nomadic education in Nigeria, we considered the general causes of low female school enrollments in Nigeria. Some of the factors are early marriages and teenage pregnancies. These are common experiences in the country, especially in the northern part of the country where the nomads are dominant. In that part of the country, many school-age girls often drop out of school because of pregnancies to marry. Secondly, cultural and religious biases adversely affect girl-child education in Nigeria. Many Nigerian parents, especially in large families with limited resources, tend to enroll boys in school instead or before girls. Some parents also keep their daughters out of schools due to misinterpretation of the tenets of the Islamic religion. This practice is typical of illiterate Muslims of which the nomads are part of. They generally believe that their female children will face sexual harassment in schools. Nonetheless, poverty and economic issues are equally contributory factors to this gap. Given the high level of poverty in Nigeria, many parents, including the nomads, often send their daughters to sell wares in the market or on the street in order to generate additional incomes for the families. For the Fulani nomads, their school-age daughters are commonly involved in the hawking of extracted cow milk. These factors are responsible for the disproportionate male-female enrolments in Nigerian schools, especially at the primary school level. Thus, it may be said that nomadic education in the country also faces these general problems.

This male-female gap in school enrolments has a very serious implication for attaining the two educational Millennium Development Goals of Universal Primary Education(UPE) and the elimination of gender disparities in the primary and secondary schools in 2015. This is so because, the EFA goals and MDGs in Nigeria aimed at raising the gender parity rate to 80% in primary 1-6 and 50% in JS1-3 by 2015, using nomadic education as a potent tool.

Furthermore, the growth rate of government expenditure on nomadic education in Nigeria was compared with that of pupils' enrolments in nomadic schools. The results are presented in table 3.

Table 3. Government Expenditure o	n Nomadic	Education	and Pupils	s Enrollment
in Nigeria				

YEAR	EXP(₦)	% $\Delta$ in EXP	ENROLLMENT	% $\Delta$ in Enrollment
1990	4227139.00		18831.00	
1991	5284802.00	25.02	65019.00	245.28
1992	2958582.00	-44.02	50152.00	-22.87
1993	11225544.00	279.42	53588.00	6.85
1994	6930438.00	-38.26	61832.00	15.38
1995	3153896.00	-54.49	92510.00	49.62
1996	8929536.00	183.13	104576.00	13.04
1997	8876172.00	-0.60	118776.00	13.58
1998	6613698.00	-25.49	116944.00	-1.54
1999	15676272.00	137.03	122535.00	4.78
2000	17382572.00	10.88	193243.00	57.70
2001	81352364.00	368.01	203844.00	5.49
2002	87872301.13	8.01	226944.00	11.33
2003	5000000.00	-43.10	303518.00	33.74
2004	51163143.22	2.33	363553.00	19.78
2005	59890663.01	17.06	375550.00	3.30
2006	70162576.31	17.15	389073.00	3.60
2007	70373063.00	0.30	389073.00	0.00
2008	70584183.00	0.30	432411.00	11.14

Source :NCNE, Annual Report,2000.

The table shows that government expenditure on nomadic education has been on the increase over the years, even though the increase has not been consistent. As it can be seen from the table, in nominal terms, the expenditure has increased over time from N4,227,139.00 in 1990 to N70,548,183.00 in 2008. However, in terms of the growth rate, the trend of the expenditure on nomadic education has not demonstrated any definite trend. For instance, in 1991, the expenditure increased by 25.05% and declined by 44.02% in 1992, it then rose tremendously by 279.42% in 1993 and thereafter, decreased by 38.26% in 1994. The declining trend continued and again, appreciated by 183.13% in 1996 and peaked in 2001 by 368.01%. The Expenditure dropped by 43% in 2003 and afterwards, increased moderately. Pupils' enrolments as depicted in the table increased continuously during the review period except in 1992 and 1998 when a decline was recorded. The enrolments increased from 18,831 pupils in 1990 to 43,244 pupils in 2008 representing a cumulative increase of 56.45% in the number of pupils enrolled.

In order to clearly see whether the increases in the government expenditure are commensurate with the changes in the enrolments, percentage rates for the expenditure and enrolments over time as contained in the table 3 were used to construct a trend graph as shown in Figure 3.



Source: Constructed from the data in Table 3.

Figure 3. Trends in Percentage change in Expenditure on Nomadic Education and School Enrollment in Nomadic school in Nigeria

A close examination of the trends reveals that the percentage increases in school enrolments by the nomads are not proportionate with the increases in government expenditure on nomadic education over time. Having discovered this, we tried to ascertain the possible causes for the disproportionate relationship between government expenditure on nomadic education and nomadic school enrolment in Nigeria. In doing this, we have engaged some variables critically to see whether they are responsible for this relationship . First, we considered the problem of underfunding of nomadic education in the country. We used the ratio of government allocations to nomadic education as the proportion of the total education allocations in the country over the years as a proxy for underfunding problem as shown in the table 5. Table 5. The ratio of Government Allocations to nomadic Education as a proportion of the total allocation to the Education sector in Nigeria.

Year	Government allocation to Education (N)	Government allocation to Nomadic Education (N)	Ratio of Government allocation to Nomadic Education as a percentage of Total allocation to Education (%)
1995	12,816,400,000	3,153,896.00	0.02
1996	15,351,900,000	8,929,536.00	0.06
1997	16,841,200,000	8,876,172.00	0.05
1998	23,666,100,000	6,613,698.00	0.06
1999	27,713,500,000	15,678,272.00	0.03
2000	64,514,932,711	17,382,572.00	0.03
2001	72,950,836,443	81,352,364.00	0.11
2002	82,094,441,815	87,872,301.13	0.06
2003	78,952,003,053	50,000,000.00	0.06
2004	93,767,886,839	51,163,145.22	0.05
2005	195,760,127,029	59,890,663.01	0.03
2006	236,224,070,330	70,162,576.31	0.03
2007	246,262,805,535	70,373,063.00	0.03
2008	356,495,828,145	70,584,183.00	0.02

Source: Computed from Tables 1 and 4

The table shows that government expenditure on nomadic education as a percentage of the total allocations to the education sector averaged 0.05%. This proportion is indeed ,too meager to exert any meaningful impact on nomadic education as per increased enrolment rates. Secondly, we considered the teacher-student ratio as a proxy for the problem of inadequacy of teachers in nomadic schools over the years as shown in the table 6. 1 0 1

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Government	Expenditure	on Nomadi	ic Education	i in Nigeria:
Implications for	Achieving th	e Millenniu	um Develop	ment Goals

Table 6. Teach	able 6. leacher-Student Ratio in nomadic Education Schools in Nigeria				
Year	Number of Teachers	Number of Pupils	Teacher-Student ratio		
1990	875	18,831	25		
1991	1489	65,019	44		
1992	2491	50,152	20		
1993	2365	53,588	23		
1994	2822	61,832	22		
1995	2788	92,510	33		
1996	2915	104,576	36		
1997	3265	118,776	37		
1998	3265	116,944	36		
1999	3365	122,535	36		
2000	4748	193,243	41		
2001	4907	203,844	42		
2002	5290	226,944	42		
2003	6306	303,518	48		
2004	6861	363,553	53		
2005	6918	375,550	55		
2006	7989	389,073	49		
2007	7989	389,073	49		
2008	8665	432,411	50		

1. . . 1

0.1

Source: Computed from Table 2

By taking the average of the teacher-student ratio over the years as contained in the table 6, it was discovered that the ratio is 1:40, implying that there are 40 students to a teacher. These number of students to a teacher is relatively high since such a teacher may find it difficult to discharge responsibilities effectively as required. The net effect may be abstentism by the students due to ineffective control over them which could degenerate into subsequent drop- out of many nomads of school-age from school. Furthermore, we examined the menace of corruption, where we used the Corruption Perceptions Indices with a view to demonstrating how corrupt practices affect public funds in Nigeria, of which nomadic education is no exception. Transparency International introduced the corruption perceptions Index in 1995 to measure the level of corruption as seen by business people and country analysts. The scores range between 10( highly clean) and 0 (highly corrupt). The CPI scores for Nigeria from 2003 to 2010 are shown in the table 7.

Table 7. The Corruption Perception Indices for Nigeria

		1	1		0			
Year	2003	2004	2005	2006	2007	2008	2009	2010
CPI	1.6	1.4	1.6	1.9	2.2	2.2	2.7	2.8
	-	~						

Source: Transparency International, 2011

From the above table, Nigeria has an average of 2.0. This implies that Nigeria is hypercorrupt. The implication is that, even with the meager allocations to nomadic education, corrupt practices may have weakened the supposedly positive impact. Thirdly, we looked at the constant migration of the nomads as a factor that may have caused low school attendance of the nomads. The nomads are typically people that travel from one place to another due to the nature of their occupations. These constant migrations have deleterious impact on school attendance of their children. Once they relocate from a given place, they abandon the schools their children were attending. Thus, it normally takes the children some time to settle down and start school in the new settlement. Lastly, we took cognizance of the factor of active involvement of the children of the nomads in the productive system. The mentality of nomads is such that they believe in training their young ones who are of school-age in their trades. This practice has made them to place more preference for their productive system than the education of their children. Consequent upon these analyzed factors, we submit that low school attendance of the nomads may be as a result of the synergy of these factors. Generally, the growth rates in school enrolments of the nomads in Nigeria is not encouraging because, of the estimated 3.3 million nomads of school going age, the available statistics show that only 432,411 nomads were enrolled for nomadic education as at 2008. This implies that, about 2,867,589 nomads representing 86.9% of the school-age nomads were not going to school. The implication is that, with all the efforts made by the government over time to ensure equal access to education among the various groups in the country with a view to achieving the MDGs in the country by 2015; only 13.1% of the total nomads of school-age were going to nomadic school as at 2008. This school enrolment rate of the nomads is too low to make any meaningful contribution to the overall achievement of the universal basic education as described in the Millennium Development Goal two.

In Nigeria generally, the Millennium Development Goals are influenced by some of these socio-economic and political factors: First, there is a disconnection between the tiers of government in the implementation of the MDGs. However, the constitutional responsibility for the implementation of almost all the goals rest with the States and Local governments in Nigeria's Federal structure; but in spite of remarkable strides at Federal level, appreciation of the requirements for meeting these goals, as well as institutional capacity remain relatively low at these levels of government. Poor governance and integration of the MDGs into national development strategies have also been a challenge. This is aggravated by policy inconsistencies, for instance, Obansanjo regime introduced NEEDS I and II, Yar'adua's administration instituted Seven-point Agenda and Vision 20:20:20 and President Goodluck has now introduced Transformation Agenda.

All these policies are at variance in principle but targeted at achieving the MDGs in the country. Other challenges include, lack of transparency and accountability in ministries, lack of the political will; a weak monitoring mechanism for the MDGs and low stakeholders involvement( private sector and civil society organizations ). Lastly is the unavailability of up to date data on most of the indicators. This is compounded by the limited funding available for data generation and management in the country.

#### Findings of the Study

Emergent from the above discussion, it was found out that the government over the years has demonstrated concern to ensure equality in the literacy level among the various groups in the country by initiating nomadic education in order to boost the literacy rate among the nomads who are educationally disadvantaged. This concern can be seen from the perspective of continued and sustained expenditure on nomadic education over the years. It was discovered that increases in government expenditure on nomadic education have precipitated increases in the number of nomadic schools in the country across the states vis-à-vis the number of teachers employed by the government to ensure smooth teaching and learning in nomadic schools in the country. The study revealed that enrolments by the nomads in the schools have also increased over time but not proportionate with the increases in the government expenditure. Factors such as underfunding, dearth of teachers, corruption, constant migration of the nomads and active involvement of the children in the productive system by the nomads may have been responsible for this gap. It was also found out that, there is wide gap between male and female enrollments in nomadic schools over the years. Factors such as early marriages and teenage pregnancies, cultural and religious biases as well as poverty and economic issues may have been responsible for gender gap in the enrolments in nomadic schools in the country.

#### **Conclusion and Recommendations**

Based on the above findings, it is concluded that the present implementation of the nomadic education in the country may make it difficult for it to be a panacea for achieving Millennium Development Goals(MDGs) in terms of universal basic education attainment by 2015. This is so because, the growth focus of the Millennium Development Goals(MDGs) is more concentrated at the importance of achieving clear and real progress in human capital development measured through educational

foundation. Consequent upon the foregoing, the following recommendations are submitted:

*First*, there should be continuous mobilization and sensitization of the nomads to send their children to these schools especially the female children so as to bridge the gap between the male- female enrolments in nomadic schools.

*Second*, the states and local governments should be made to supplement the federal government funding of the nomadic education, as this will go along way boosting the achievements in nomadic education in the country.

*Third*, nomadic educational development initiatives should be planned and aligned with other community improvement and development programs such as agricultural extension, rural development and social welfare services. This approach will attract the interest and involvement of more stakeholders as this will encourage the stakeholders to support the program.

*Fourthly,* there should be selection of more individuals from nomadic communities for training as teachers, this is because they are more acquainted with the cultural values of the nomads. Thus, they will be better placed to inculcate the necessary knowledge in the targeted nomads.

*Fifthly,* the government should provide support to animal health issues especially on major diseases and vaccines as well as provision of support in the area of water development for improvement of livestock production and reduction of incident of conflicts between the nomads and the hosting communities. This practice will make the nomads more stable in a place to receive nomadic education.

*Sixthly,* government should seek more new partnerships and greater collaboration with development partners and other stakeholders in other to boost the financing of nomadic education for higher results.

*Seventhly,* NCNE should adopt a flexible timetable that adjusts itself to seasons favorable to nomads, as this would enhance their enrollments.

*Finally*, the government should actively consider the issue of language barrier to communication, and find contextually appropriate language policies.

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#### Appendix I

Figure 1. An Organogram showing the organizational Chart of National Commission for Nomadic Education

# ORGANISATIONAL CHART OF NATIONAL COMMISSION FOR NOMADIC EDUCATION



Source: NCNE, 2000

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