International Journal of Academic Research in Management and Business

Volume 1, No 1, year 2016

International Academic Publishing Group
Groupe Editions Académiques internationales
Impact of the Presence of an Audit Committee on the Stock Market Performance of Tunisian Banks

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Abstract

The question of performance is located in the heart of the issue of the governance of the banks. The purpose of this issue is whether the governance mechanisms significantly explain the performance level. This paper aims to study the impact of the presence of an audit committee on the stock market performance of Tunisian banks.

Key words:
Audit Committee, governance, performance, stocks market, banks, Tunisian

1. Introduction

The performance has always been a subject discussed and criticized as each individual interested in it (scientist, officer, customer, shareholder, etc.) approached the angle of its own. This explains, without doubt, the number of important conceptual models proposed in the literature concerning this concept. In effect, the concept of governance has been the subject of several disputes between the researchers who seek to properly assess the existing relationship between a system of governance within the firm and the
performance of the latter, i.e. to check if a good governance can ensure a proper functioning of the enterprise and, therefore, improve the performance.

As well as a banking system which effectively uses the available resources to productive uses is an essential mechanism for a healthy economy and vigorous (economic growth) responding to the needs of key economic actors (Levine 1997). It is in order to promote the performance of financial systems that policies of governance have been put.

In this framework, a central question which arises is to assess the impact of the presence of the Audit Committee, as a mechanism for the system of governance, on the stock market performance of Tunisian banks saw that the financial sector has an important role in the process of economic development.

To answer this question our study will be structured as follows: a first part which deals with the theoretical framework of the study. Then, it is necessary to present the research methodology, the model and the variables. And finally, the discussion of the results.

2. Theoretical Framework

Governance is a theme to which interested researchers from various fields including the social sciences, science policies, the legislators and the international institutions (the World Bank and the IMF). In effect, the adoption of a system of governance will enrich the activity of any company, that is to say that it occupies a prominent place within the firm, and it has become a strategic variable that he must know mastering and which is essential to the proper functioning of the firm. It is in this context that we are interested in this research to appreciate the vital role of an audit committee within a company. As well, an Audit Committee is judged according to various variable including:

- **The size of the Audit Committee**: the audit committee plays a key role in supporting the interests of shareholders and other stakeholders. In addition, its effectiveness is subject to its specificities which are essentially on the independence of its members, the size, the frequency of meetings and the expertise of the members of the audit committee especially at the accounting level and financial.

  As regards the size of an audit committee, Anderson et al (2004) have shown that the audit committees of large size can better protect and better monitor the accounting process and financial report by the committees of small size in introducing greater transparency to shareholders and creditors which positively affects, therefore, the financial performance of the company. This idea
is confirmed by Bedard et al (2004), which stipulate the importance of the large size of the Audit Committee to ensure a more effective control of the accounting process and financial.

And therefore, our hypothesis is:

**H1: The size of an audit committee positively affects the financial performance.**

- **The frequency of meeting of the Audit Committee:** Beasley et al (2000) exposed that audit committees of companies who have not committed deception have retained more meetings than those where fraud have been revealed. They expose, again, that audit committees of companies having deceived met only once a year with three to four times for the other committees. In the same framework, Abbott et al (2000) have advocated that the companies whose audit committees have met at least two times per year have a lesser probability of being punished by "Securities and Exchange Commission" for problems of exposure of the accounting and financial information. Yet, Vafeas (1999) has shown that the number of meetings of an audit committee may be advantageous for the company if the functions learned Excess amount the costs incurred. Where our hypothesis:

**H2: The frequency of meeting of the Audit Committee positively affects the financial performance.**

- **The expertise of the members of the Board of Directors:** In this context, Dezoort et al (2002) seek that audit committees must be assigned at least three independent members, with a financial culture, in more than one of them has a high expertise in the area of accounting and financial. Yang et al (2005) and Carcello et al (2006) stipulate that the members of the audit committee must have the expertise essential particularly at the level of the accounting plan and financial assistance in order to design their mission for the monitoring of internal control and the financial report. And therefore our hypothesis will be:

**H3: The expertise of the members of the Board of Directors positively affects the financial performance.**

- **The composition of the Audit Committee:** the results concerning the relationship Audit Committee-performance are mixed. In effect, Charreaux (1997), Yeoh and Jubb (2001) announce that the audit thus cooperates to weaken the asymmetry of information underlying the report
between the various collaborators, to resolve conflicts of agency examined as significant impediment to development and to the continuity of firms and, to reduce the costs relating thereto. Thus, Marrakchi et al (2001) and Bradbury et al (2006) guessing that audit committees be composed in majority or exclusively by external directors are more independent than the other committees. On their part, Bryan et al (2004) noted that the independence of the Audit Committee positively affects the quality of the profits. While, Klein (2002) enters a negative relationship between the management of results and the independence of the Audit Committee. Similarly, Brown and Caylor (2004) outline that the independence of audit committees is not positively related to the performance of the Organization. They discover again that the audit fees are negatively attached to the measures of the performance.

Of this fact, our hypothesis to check is:

H4: the independence of the members of the Audit Committee has a positive impact on financial performance.

3. Research Methodology

We make in this framework the methodological choices undertaken to be able to inspect the assumptions of the research. First of all, we express our study sample. And then, we stallions variables and the model of research.

3.1. Framework of the study

The collection of data has been carried out by referring to the report of the basis of the banks listed (Amen Bank, ATB, Attijari Bank, BH, BIAT, BNA, BT, BTE, STB, UBCI, and UIB) published by the Council of the financial market (CMF), the Bourse of securities (Tunisian BVMT) and the professional association of banks of Tunisia (APBT). As well, the interval of study is 10 years covering the period from 2005 to 2014 saw that the number of banks is relatively small. This gives a panel of 110 observations. Concerning the stock market indications and the information of the audit committee are collected from the annual activity reports of the banks, of the annual reports of the APTBEF, guides of the BVMT and documents of the Council of the financial market (FJA).
3.2. Presentation of the model and research variables

In what follows, it presents the variables used as well to assess the impact of the presence of the Audit Committee on the performance of banking. Of this fact, our model is as follows:

\[
\text{PER}_{i,t} = \beta_0 + \beta_1 \text{TAI-AUD}_{i,t} + \beta_2 \text{REU-AUD}_{i,t} + \beta_3 \text{CC2}_{i,t} + \beta_4 \text{big4}_{i,t} + \beta_5 \text{End} + \epsilon_{i,T}
\]

With:

- **PER**: price earning ratio which defines the stock market performance. It is measured by the report Market Capitalization/net result.
- **TAI-aud**: the size of the Audit Committee which is measured by the number of administrators who sit there.
- **REU-aud**: Frequency of meetings which is measured by the number of meetings of the audit committee by year.
- **CC2**: It designates expertise of the members of the committee. It is a binary variable equal to 1 if the bank is audited by two auditors, 0 otherwise.
- **BIG4**: it refers to the independence of the members of the Council. It is a binary variable that takes 1 if the Commissioner of accounts belongs to the big 4 and 0 otherwise.
- **END**: indicates rate of indebtedness of the Bank. C is the total report debts / total assets. Thus, this variable represents a tool for the control of leaders and, subsequently, an indicator to evaluate the performance given that it requires the leaders to be powerful and motivate them to create value. Therefore, the leaders will need to be reasonable and effective in the use of Bank funds. Yet, the obligation to fix the deadline for repayment of the debt reduces the autonomy and independence of the Leader by report to the shareholders. In the literature, Stulz (1990), Jensen (1986, 1993) believes that the debt discourages and demotivates the leader to overinvest for its own interest. While Altman (1968, 1984) suggests that the company which performs a low performance is the one that is the most indebted.
4. Discussion and Interpretation of the results

4.1. Descriptive Statistics

Table 1: Descriptive Statistics

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Median</th>
<th>Max</th>
<th>Min</th>
<th>Std. Dev.</th>
<th>Skewness</th>
<th>Kurtosis</th>
<th>Jarque-Bera</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>PER</td>
<td>0.144</td>
<td>0.1314</td>
<td>0.3265</td>
<td>0.0230</td>
<td>0.0703</td>
<td>0.6402</td>
<td>2.7935</td>
<td>7.7095</td>
<td>0.0211</td>
</tr>
<tr>
<td>TAI_Aud_int</td>
<td>3.627</td>
<td>4.0000</td>
<td>6.0000</td>
<td>3.0000</td>
<td>0.6884</td>
<td>0.8044</td>
<td>3.1377</td>
<td>11.9499</td>
<td>0.0025</td>
</tr>
<tr>
<td>REU_AUD</td>
<td>4.181</td>
<td>4.0000</td>
<td>6.0000</td>
<td>3.0000</td>
<td>0.6370</td>
<td>0.8928</td>
<td>4.5157</td>
<td>25.1285</td>
<td>0.000003</td>
</tr>
<tr>
<td>CC2</td>
<td>0.890</td>
<td>1.0000</td>
<td>1.0000</td>
<td>0.0000</td>
<td>0.3131</td>
<td>-2.5078</td>
<td>7.289</td>
<td>199.6178</td>
<td>0.000</td>
</tr>
<tr>
<td>BIG4</td>
<td>0.654</td>
<td>1.0000</td>
<td>1.0000</td>
<td>0.0000</td>
<td>0.47769</td>
<td>-0.6501</td>
<td>1.4225</td>
<td>19.151</td>
<td>0.000069</td>
</tr>
<tr>
<td>TACTIF</td>
<td>14.97</td>
<td>15.156</td>
<td>15.9842</td>
<td>12.490</td>
<td>0.75439</td>
<td>-1.2830</td>
<td>4.5782</td>
<td>41.597</td>
<td>0.000</td>
</tr>
</tbody>
</table>

According to this table, the average size of the audit committee is 3 Members and the number of average meeting is four per year. In addition, the coefficient of skewness is different from 0. This indicates the presence of asymmetry, which may be an indicator of non-linearity, since that the linear models are Gaussian necessarily symmetrical. This asymmetry is explained by the fact that the volatility is lower after an increase that after a decrease of profitability. Yet, a coefficient of negative skewness shows that the distribution is extended to the left that is to say that the variables to explain are resistant to benefit to a negative shock rather than a positive shock. And therefore, the assumption of normality is not inspected and the test Jarque-Bera authenticates well this outcome and rejects significantly the normal distribution of the different variables in the sample; this symbolizes a normal characteristic of financial series for the majority of the variables to explain.
4.2. Correlation Test

Table 2: Test of correlation of Pearson

<table>
<thead>
<tr>
<th>PER</th>
<th>TAI_Aud_int</th>
<th>REU_AUD</th>
<th>CC2</th>
<th>BIG4</th>
<th>TACTIF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Correlation</td>
<td>0.424637</td>
<td>-0.049389</td>
<td>0.137353</td>
<td>0.003829</td>
<td>-0.343754</td>
</tr>
<tr>
<td>Prob</td>
<td>0.0000</td>
<td>0.6084</td>
<td>0.1525</td>
<td>0.9683</td>
<td>0.0002</td>
</tr>
</tbody>
</table>

Has the basis of the results of this table, it is to be noted that the variable size of the internal audit positively affects the stock market performance of Tunisian banks saw that she has a coefficient of correlation positive and a probability which does not exceed the threshold. Whereas for the other variables meeting of audit, the auditors and the Big4 have no relation with the stock market performance of Tunisian banks saw that they present a probability greater than the threshold (5% and 10%).

4.3. Test of homogeneity

Table 3: test of homogeneity

<table>
<thead>
<tr>
<th>Redundant fixed effects tests</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equation: EQ01</td>
</tr>
<tr>
<td>Test cross-section fixed effects</td>
</tr>
<tr>
<td>Effects Test</td>
</tr>
<tr>
<td>Cross-section F</td>
</tr>
<tr>
<td>Cross-section Chi-square</td>
</tr>
</tbody>
</table>

H0: All $\alpha_i$ are constant, where the model is homogeneous, and therefore, it is necessary to choose the model estimated by the OLS method.

H1: The $\alpha_i$ are different, where the model is heterogeneous, and therefore, it is necessary to perform the test of Hausman.
The decision rule is to accept the hypothesis \( H_0 \) if and only if \( F \) calculated does not exceed \( f \) tabulated (according to the Statistics Table of Fisher), and defer \( H_0 \) in the reverse case.

We note here that \( F \) calculated exceeds tabulated \( F \), and therefore the model is heterogeneous, therefore it is necessary to pass the test of Hausman, authorizing to decide if this effect is fixed or random. Our model presents individual effect (the statistics of Fisher is significant at the threshold of 1% (pro<0.01). The banks are not homogeneous according to our model.

4.4. Test of Hausman

<table>
<thead>
<tr>
<th>Table 4 : test of Hausman</th>
</tr>
</thead>
<tbody>
<tr>
<td>Correlated random effects - Hausman Test</td>
</tr>
<tr>
<td>Equation: EQ01</td>
</tr>
<tr>
<td>Test cross-section random effects</td>
</tr>
<tr>
<td>Test Summary</td>
</tr>
<tr>
<td>Cross-section random</td>
</tr>
</tbody>
</table>

This test is operated in the case where the model is heterogeneous. It allows you to choose between the model estimated by the OLS method with fixed effect and the random effect.

\( H_0 \): The individual effect is random
\( H_1 \): The individual effect is fixed

The decision rule is to reject the null hypothesis (\( H_0 \)) if \( Q_H \) is greater than the fractile of the Act of \( KHI\)-two at the threshold of 5%, and accept \( H_0 \) in the opposite case.

We note here that \( Q_h \) exceeds the fractile of the Act of \( KHI\)-two, and therefore, it leads to prefer the estimate to fixed effect, therefore reject \( H_0 \).

The statistics of \( KHI\)-two of Hausman is significant at the 5% threshold (pro<0.05). So we accept that the individual effect is deterministic (fixed)
4.5. Estimation of the model

Table 5: Estimation of the model

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>T-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>TAI_Aud_int</td>
<td>0.031615</td>
<td>0.010467</td>
<td>3.020443</td>
<td>0.0033</td>
</tr>
<tr>
<td>REU_AUD</td>
<td>0.008586</td>
<td>0.007932</td>
<td>1.082407</td>
<td>0.2818</td>
</tr>
<tr>
<td>CC2</td>
<td>0.021771</td>
<td>0.014548</td>
<td>1.496510</td>
<td>0.1379</td>
</tr>
<tr>
<td>BIG4</td>
<td>-0.072580</td>
<td>0.016849</td>
<td>-4.307641</td>
<td>0.0000</td>
</tr>
<tr>
<td>END</td>
<td>0.291042</td>
<td>0.201282</td>
<td>1.445945</td>
<td>0.1515</td>
</tr>
<tr>
<td>C</td>
<td>-0.240300</td>
<td>0.187743</td>
<td>-1.279940</td>
<td>0.2037</td>
</tr>
</tbody>
</table>

Effects Specification

Cross-section fixed (dummy variables)

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>R-squared</td>
<td>0.646326</td>
<td>Mean dependent Var</td>
<td>0.144975</td>
<td></td>
</tr>
<tr>
<td>Adjusted R-squared</td>
<td>0.589889</td>
<td>S.D. dependent Var</td>
<td>0.070553</td>
<td></td>
</tr>
<tr>
<td>S.E. of regression</td>
<td>0.045182</td>
<td>Akaike Info criterion</td>
<td>-3.222520</td>
<td></td>
</tr>
<tr>
<td>Sum squared resid</td>
<td>0.191891</td>
<td>Schwarz criterion</td>
<td>-2.829723</td>
<td></td>
</tr>
<tr>
<td>Log Likelihood</td>
<td>193.2386</td>
<td>Criter Hannan-Quinn.</td>
<td>-3.063199</td>
<td></td>
</tr>
<tr>
<td>F-statistic</td>
<td>11.45211</td>
<td>Durbin-Watson stat</td>
<td>1.180592</td>
<td></td>
</tr>
<tr>
<td>Prob (F-statistic)</td>
<td>0.000000</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

According to these data, only the variable size of the audit presents a positive coefficient with a probability less than the threshold. Of this fact, the size of the audit committee a positive impact on the stock market performance of Tunisian banks. This idea is certified by Bedard et al (2004) which express the importance of the large size of the Audit Committee to ensure a more effective control of the accounting process and financial.

Thus, the variable BIG4 admits a probability less than the threshold but with a negative coefficient, which means that the membership of the Commissioners to the counts in the BIG4 negatively affects the stock market performance. This conclusion is identical to that of Klein (2002) and brown and Caylor (2004) which introduce a negative relationship between the management of results and the independence of the
Audit Committee. Yet for the other variables, number of auditors and number of meeting of the Audit Committee have no impact on the stock market performance of Tunisian banks.

According to the regression, we can say that our model is equipped with a good explanatory power since it explains 64% (r² = 0.646326) of the variation of the banking performance (measured by the ratio per) and also seen that R² is superior to R² adjusted (R² adjusted = 0.589889).

In addition, it is to be noted that F-statistic = 11.45211 exceeds tabulated F = 2.854; this encloses that the model is significant overall. In other words, the variables of the Audit Committee (the size, the frequency of meeting, the number of auditors, belonging to BIG4) spread the overall efficiency of Tunisian banks. As well, the value of the Durbin Watson tends toward 2, it is therefore expected that there is no problem of auto correlation of errors.

5. Conclusion:

The performance is a topical subject; however its moderation is proving to be delicate. In effect, to verify the impact of the system of governance on the performance of banks, several surveys and models have been implemented. Throughout this work, we have tried to provide answers to the question on the impact of the existence of an audit committee on the performance of banking. To do this, we began our theoretical exploration by the analysis of the relationship between performance and individuals of an audit committee. We have led to the theoretical result that an audit committee affects the performance of the firm. To check these results empirically, we conducted a survey of 11 banks listed on several years (10 years: 2005 to 2014) using the method of panel. We have noticed that the majority of our basic assumptions are not confirmed.

As well, the result leads us to focus on the following points:

- The size of the Audit Committee positively affects the stock market performance of Tunisian banks, and therefore, this variable cooperates in the development of the banking sector.

- Concerning the variables relating to the frequency of the committee meeting, the number of Commissioners to the account and the belonging to BIG4, they have a negative impact on the stock market performance of Tunisian banks.

- The variable indebtedness of the Bank has a negative effect on the banking performance: the more the bank is indebted, the more the banking performance deteriorates.
Bibliography

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Dynamics of the exchange rate in Tunisia

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Published : 04-07-2016

Abstract

The exchange rates are at the heart of international economic relations and are an integral part of the everyday landscape of economic agents. The Tunisia like the other country is faced with the problem of determination of the rate of exchange that will allow him to achieve the major balances internal and external. The objective of this research is to explain the rate of exchange to the assistance of a number of explanatory variables to enable managers of the economic policy to appreciate in the time their contribution to economic activity. It is clear from the results of this research that have a positive influence on the equilibrium exchange rate while the external capital and the budgetary deficit have a significant negative impact on the equilibrium exchange rate.

Key words:
Exchange rate, budget deficit, exchange term, monetary mass

Introduction

The exchange rate appears today as a strategic variable because it is the reflection of the relations of independence and of domination between economies. The relationship between external debts on economic growth can differ from one country to the other, taking into account its specificity. In effect, as shown by the results of the empirical work already cited, they remain contradictory as to the nature of the
relationship between external debt and growth, according to the panel of selected countries and the period of the study. The purpose of this research is to highlight, through an empirical analysis, the impact of variables macro-economic (monetary mass, budget deficit, exchange term, external capital) the equilibrium real exchange rate in Tunisia. In this context, the question to which we will try to provide a response to the end of this research is: "What are the determinants of the equilibrium exchange rate in Tunisia. What is the impact of macroeconomic variables (monetary mass, budget deficit, external capital and exchange term) on the rate of real exchange of balance?"

1. Framework of analysis and assumptions

Theoretically, the exchange rate which is the course (price) of a currency (currency) by report to another, represents a macroeconomic instrument is quite important, because it allows among other things to measure the state of health of an economy and to adjust the monetary policy and commercial activities of a country. Of this fact, it may be a brake to its increase if it is not regulated and even controlled.

From a macroeconomic point of view, the real exchange rate is an indicator of competitiveness in the sense that it informs on the report of the domestic prices and external prices of goods and services. If it is low, the residents of a country will tend to buy little good and services abroad. Otherwise, they will have the opposite behavior.

1.1. Theoretical justifies

The relationship between the exchange rate and the variables economic macro has been the subject of several empirical work. The exchange rate between two currencies is subject to many factors of influence from a macroeconomic point of view. These factors interact between themselves and it is their confrontation which sets the rate of exchange. This is a very monitored by the different political and monetary authorities. Williamson (1985, 1994) defined the real exchange rate as the rate of ensuring in the medium term to the simultaneous achievement of the internal balance and the external balance. A decline in the real effective exchange rate TCER may mean a depreciation of the local currency, leads to a decline in imports which are becoming more expensive and a rise in exports since the domestic products become more competitive abroad. As well, a depreciation of the local currency has a positive effect on the balance of the current account balance.
The field of application of the exchange rate is very large, we will confine ourselves has four factors that can influence the exchange rate.

**The terms of the exchange (TDE):** This indicator allows therefore to measure the purchasing power of exports in imports, that is to say that there is a measure of the ability of a country to pay its imports thanks to its exports. The terms of the exchange express a relative price external. The shocks of the TE influence the equilibrium exchange rate through the relative price of non-tradable relative to the prices of tradable goods. The exchange term is defined as the relative price of exports relative to the prices of imports. The impact of changes in terms of the exchange on the equilibrium exchange rate is theoretically ambiguous according to the authors as Elbadawi and Soto (1997) Aron et al (1997) and Edwards (1989).

**The flow of capital (KE):** Capital flows affect the relative prices of goods tradable and non-tradable and therefore the equilibrium exchange rate. EDWARDS (1989) shows in his study on the developing countries that an increase of capital flows in the economy leads to an appreciation of the exchange rate. Therefore a relaxation of control of capital flows would lead to a depreciation of the exchange rate. An entry of capital in the economy leads to the appreciation of the TCER; while an output of capital depreciates the TCER. In effect, an entry of capital leads to the increase in the demand of non-tradable and therefore the increase in their price. We expect that the sign assigned to this variable is negative.

**The monetary mass (MM):** an increase of the monetary mass is manifested by an appreciation of the real exchange rate of balance. A decline of the monetary mass is manifested by the depreciation of the equilibrium real exchange rate in effect, any increase of the monetary mass leads to the increase of the prices of tradable goods and to the decrease in foreign exchange reserves.

**Budget deficit (DB):** The dependency of a country from the outside to finance its deficit has of influences on the equilibrium exchange rate. In effect when a nation is recourse to external assistance to finance its deficit this implies in a first time of capital inflows but depreciates in a second time the national currency. Then the volume of debts against the outside to a impact on the equilibrium exchange rate. In general, the more the debt of a country is high, more investors are suspicious. In effect, a level of high debt suggests an uncertainty on the solvency of the country and generates the inflation (which depreciates the value of a currency in the foreign exchange market). Everything is then question of confidence of investors. If the investors have confidence in the country, this has no impact on the exchange rate. On the
other hand, if the investors have doubts as to the ability of a country to repay its debt, its currency will depreciate on the foreign exchange market.

The assumptions that we will test in this regard is the following:

H1. There is a positive effect of the monetary mass on equilibrium real exchange rate

H2. There is a negative effect of budget deficit on equilibrium real exchange rate

H3. There is a negative effect of external capital on equilibrium real exchange rate

H4. There is a positive effect of the term exchange on equilibrium real exchange rate

2. Research Methodology

Our study therefore is based on the determination of the factors influencing the equilibrium real exchange rate in Tunisia, the variable used in this study is other than variables macroeconomic. To this effect, the data that will serve as the basis for the analysis are annual data. The data used come from the indicators of the development of the World Bank (World Development Indicators 2015); Statistical Yearbooks of the INSAE, of public finance statistics of the Ministry of Economy and Finance. The period of the study extends from 2000 to 2015 and is justified by the desire to cover a sufficient number of years to identify trends more or less significant.

2.1. Model and measuring variables

The main objective of this study is to analyze the impact of macro-economic variables on the rate of exchange of the actual balance in Tunisia. In a specific way, the study is to analyze the rate of exchange in Tunisia and to establish a link between the fundamental factors (monetary mass, exchange term, budgetary deficits and external capital) and the equilibrium real exchange rate in Tunisia by an econometric approach. We consider the following model:

\[ Y_i = a_0 + a_1 X_{i1} + a_2 X_{i2} + \ldots + a_p X_{ip} + \varepsilon_i, \quad i = 1, \ldots, n \]
With: \( e_i \) is the error of the model which expresses, or summarizes, the missing information in the linear explanation of the values of \( Y_i \) from \( X_{i1}, \ldots; X_{ip} \) (problem of specifications, variables not taken into account, etc.).

\[ A_0, A_1, \ldots, A_P \] are the parameters to estimate.

In effect, all the variables in the model have been transformed in logarithmic form.

We believe the coefficients using the following model:

\[
TCRE = a_0 + b_1MM + b_2KE + b_3DP + b_4Te + e_i
\]

It is necessary at this level of our work to clarify our approach given that there are several conceptual models explaining the relationship between the equilibrium real exchange rate and the macroeconomic variables. As well, we will analyze the relationship that exists between the monetary mass, the budget deficit, external capital, the terms of the exchange and the equilibrium real exchange rate.

To this effect, in order to be able to respond to our research questions, we will detail the research variables in defining the practical indicators capable of measuring these variables.

### 2.2. Dependent variable

We studied as the dependent variable the real effective exchange rate that represents the exchange rate of a monetary zone, measured as a weighted sum of the exchange rate with the different trading partners and competitors. We measure the nominal effective exchange rate (with the parities Nominal) and the real effective exchange rate, therefore deflated, with the taken into account for this last price indices and their developments. According to Williamson (1994) the equilibrium real exchange rate is defined as the real effective exchange rate to simultaneously achieve the balances internal and external to the medium term. This real effective exchange rate would be our endogenous variable (macroeconomic approach).

### 2.3. Independent variables

In this study, we are going to retain 4 independent variables:

**The terms of the exchange** (TDE): this is the ratio between the value of the exports and imports of a country during a given period.
The flow of capital (KE): Capital flows affect the relative prices of goods tradable and non-tradable and therefore the equilibrium exchange rate.

The monetary mass (MM): An increase of the monetary mass is manifested by an appreciation of the TCER.

Budget deficit (DB): The dependency of a country from the outside to finance its deficit has of influences on the equilibrium exchange rate.

The whole of these factors involved in the explanation of the relationship between the equilibrium real exchange rate and the macro economic variables in Tunisia, can be presented in the following figure:

The figure (1) summarizes the assumptions made. The model established includes the various determinants of the exchange rate that we have been able to identify in the literature.

The empirical study will test the whole of these assumptions to determine, by the explanatory variables, those who are non-discriminatory for the dynamics of the exchange rate.
3. Econometric analysis of the determinants of changes

After having presented our model of research, our assumptions, our sample, the techniques selected as well as the preferred tests, we are going to proceed to the actual analysis of the data, their interpretation and the audit of our assumptions.

3.1. Study of the stationarity

**Stationarity of the series in level**

We test here the assumptions:

H0: The series in level is non-stationary

H1: The series in level is stationary

The application of the test of unit root test series in level allows us to draw the following table:

<table>
<thead>
<tr>
<th>The variables</th>
<th>TCER</th>
<th>TDE</th>
<th>MM</th>
<th>DB</th>
<th>KE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
<td>With constant And Trend</td>
<td>With constant And Trend</td>
<td>With constant And Trend</td>
<td>With constant And Trend</td>
<td>With constant And Trend</td>
</tr>
<tr>
<td>T.statistics</td>
<td>-1.2123</td>
<td>-0.4256</td>
<td>-1.3652</td>
<td>-1.87454</td>
<td>-2.4253</td>
</tr>
<tr>
<td>Critical values (thresholds 5%)</td>
<td>-2.4215</td>
<td>-2.5246</td>
<td>-3.2156</td>
<td>-2.3265</td>
<td>-2.5241</td>
</tr>
<tr>
<td>Likelihood</td>
<td>0.1562</td>
<td>0.2152</td>
<td>0.1289</td>
<td>0.1228</td>
<td>0.3110</td>
</tr>
<tr>
<td>Stationarity</td>
<td>Non</td>
<td>Non</td>
<td>Non</td>
<td>Non</td>
<td>Non</td>
</tr>
</tbody>
</table>

The table (1) relating to the ADF test shows a value of t statistics lower in absolute value the critical values at the threshold of (5%). The variables studied are therefore non-stationary. Accordingly to this non stationarity, we turn the test level to the first differentiation (variation of the index).
**Stationarity of differentiated series**

We test here the hypothesis:

$H_0$: The series in first difference is non-stationary

$H_1$: The series in first difference is stationary

The application of the test of unit root test of differentiated series allows us to draw the following table:

<table>
<thead>
<tr>
<th>The variables</th>
<th>TCER</th>
<th>TDE</th>
<th>MM</th>
<th>DB</th>
<th>KE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Model</strong></td>
<td>Without constant Or trend</td>
<td>Without constant Or trend</td>
<td>Without constant Or trend</td>
<td>Without constant Or trend</td>
<td>Without constant Or trend</td>
</tr>
<tr>
<td><strong>T.statistics</strong></td>
<td>-1.325</td>
<td>-2.523</td>
<td>-3.42</td>
<td>-2.56</td>
<td>-2.75</td>
</tr>
<tr>
<td><strong>Critical values (thresholds 5%)</strong></td>
<td>-1.31</td>
<td>-1.53</td>
<td>-1.38</td>
<td>-2.26</td>
<td>-1.37</td>
</tr>
<tr>
<td><strong>Likelihood</strong></td>
<td>0.000</td>
<td>0.0021</td>
<td>0.0002</td>
<td>0.0017</td>
<td>0.004</td>
</tr>
<tr>
<td><strong>Stationarity I(1)</strong></td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

The table (2) relative to the ADF test indicates to us that the t statistics of the variables studied are widely higher in absolute value to the threshold of (5%). We conclude that the indices relating to these countries are integrated of order (1) or I(1).

**3.2. Test of Johansen**

The assumptions of the test are:

$H_0$: Presence at least of a cointegrating relationship
H1: absence of cointegration relationship between the variables

The application of the test of Johansen allows us to draw the table below:

**Table 3. Test table of Johansen**

<table>
<thead>
<tr>
<th>Null hypotheses</th>
<th>Own values</th>
<th>Trace statistics</th>
<th>Critical Values 1%</th>
</tr>
</thead>
<tbody>
<tr>
<td>No *</td>
<td>0.265368</td>
<td>98.58975</td>
<td>81.32652</td>
</tr>
<tr>
<td>At most 1</td>
<td>0.445263</td>
<td>42.523698</td>
<td>53.42153</td>
</tr>
<tr>
<td>More than 2</td>
<td>0.623598</td>
<td>18.421568</td>
<td>33.12845</td>
</tr>
<tr>
<td>At most 3</td>
<td>0.1256321</td>
<td>14.258984</td>
<td>30.98265</td>
</tr>
<tr>
<td>At most 4</td>
<td>0.162354</td>
<td>10.156942</td>
<td>12.03261</td>
</tr>
<tr>
<td>More than 5</td>
<td>0.062538</td>
<td>4.5212136</td>
<td>8.845682</td>
</tr>
</tbody>
</table>

* indicates that we must reject H1 and go to the second iteration.

The results of the test of the trace for the three countries, we show that the variables studied in the model are cointegrated at the threshold of 5%. The null hypothesis of the absence of cointegration is rejected on the fact that the test of the trace indicates the existence of a cointegrating relationship. The disadvantage of this model is that it does not allow us to detect the direction of causality between the variables.

**3.3. Correlation Test**

The results of the correlation analysis per capita gross domestic product, rate of investment, debt service, rates of population growth and price index of consumption are represented in the table (4).

**Table 4. Matrix of correlations**

<table>
<thead>
<tr>
<th></th>
<th>TCER</th>
<th>MM</th>
<th>DB</th>
<th>KE</th>
<th>TE</th>
</tr>
</thead>
<tbody>
<tr>
<td>TCER</td>
<td>1</td>
<td>0.44</td>
<td>0.32</td>
<td>0.03</td>
<td>-0.06</td>
</tr>
<tr>
<td>MM</td>
<td>1</td>
<td>0.04</td>
<td>0.20</td>
<td>0.11</td>
<td></td>
</tr>
<tr>
<td>DB</td>
<td>0.09</td>
<td>1</td>
<td>0.12</td>
<td></td>
<td></td>
</tr>
<tr>
<td>KE</td>
<td>0.29</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TE</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The MASE Monetary Affairs is positively correlated with equilibrium real exchange rate. Thus, the variable "external capital" is weakly correlated with the dependent variable. However, the correlations do
not highlight that an association without mean that there is between the variables concerned a causal relationship. In addition, it presents a major inconvenience to never reasoning on more than two variables at a time (TSAPI, 1997). Using the test of multiple regression we will try to answer this question.

3.4. Regression analysis

<table>
<thead>
<tr>
<th>The variables</th>
<th>C</th>
<th>MM</th>
<th>DB</th>
<th>KE</th>
<th>TE</th>
</tr>
</thead>
<tbody>
<tr>
<td>The coefficients</td>
<td>0.45</td>
<td>0.98</td>
<td>0.12</td>
<td>-0.076</td>
<td>-0.08</td>
</tr>
<tr>
<td>Likelihood</td>
<td>0.000</td>
<td>0.065</td>
<td>0.112</td>
<td>0.000</td>
<td>0.001</td>
</tr>
<tr>
<td>Prob (F-statistic)</td>
<td></td>
<td></td>
<td></td>
<td>0.000</td>
<td></td>
</tr>
<tr>
<td>F-statistic</td>
<td></td>
<td></td>
<td></td>
<td>30.24</td>
<td></td>
</tr>
<tr>
<td>R2</td>
<td></td>
<td></td>
<td></td>
<td>0.926</td>
<td></td>
</tr>
<tr>
<td>Adjusted R2</td>
<td></td>
<td></td>
<td></td>
<td>0.904</td>
<td></td>
</tr>
</tbody>
</table>

Based on the table (5), we note that the explanatory power of this model is acceptable (R adjusted=0.926) and their overall significance can reject the null hypothesis which stipulates that the coefficients are all zero (F=30.24, p<0.05). The result of the model shows that the sign of connection between the variables studied and the dependent variable (TCER) are statically significant. As it is anticipated the monetary mass and the budgetary deficit have a positive influence on the equilibrium exchange rate respectively (B=0.98 p<0.05; b=0.12 p<0.05). Then, the external capital have a significant negative impact on the equilibrium exchange rate (b= -0.76; p<0.05).

The analysis of the overall quality of the model can be performed through the coefficient of determination of the model (R2). The coefficient of determination explains the part of the variability of the dependent variable which is explained by the exogenous variables considered at the level of the model. Of this fact, this coefficient is equal to 0.92 C is to say that the equilibrium real exchange rate is explained at 0.92, by the variables selected.
The coefficient of exchange term is negative and statistically significant. It indicates that a deterioration of the terms of the exchange of a point would entail a depreciation of the real exchange rate of the balance of the order of 0.08 point any thing equal by elsewhere

According to the literature the monetary mass has a positive impact with the equilibrium real exchange rate. In accordance with the economic literature, it is clear from our regression that the monetary mass exerts a positive and significant impact on the equilibrium real exchange rate. In effect, an increase of one point of the monetary mass would lead to an appreciation of the level of the real effective exchange rate in the order of 0.98 point, all other things being equal.

For the variable budget deficit, the sign of the coefficient is positive and statistically significant. The budget deficit positively affects the equilibrium real exchange rate. The budget deficit has a positive and significant effect on the real effective exchange rate. An increase of 10 per cent of the level of the budget deficit would lead to an appreciation of the real effective exchange rate in the order of 12%. This result is not totally disagree with the findings of the theory, this could be explained by the fact that the Tunisia made use of other sources of funding for its deficit other than external capital.

The external capital has negative effects on the dynamics of the equilibrium real exchange rate. Its coefficient indicates that an increase of 10% of external capital, leads a depreciation of the equilibrium real exchange rate of the order of 7.6%. This result is in accordance with the theoretical work that shows that an entry of capital leads to the increase in the demand of non-tradable and therefore the increase in their prices, which devalues the equilibrium real exchange rate.

**Conclusion**

The theory of the exchange rate has been at the heart of the debates in the international trade and finds its focal point in theory international monetary and in the analysis of the determinants that affect the exchange rate. The purpose of this research is thus to develop, through an empirical analysis, the impact of macroeconomic variables on the equilibrium real exchange rate. In the light of the results found in the empirical analysis, we can formulate some recommendations:
-The monetary mass and the budgetary deficit have a positive influence on the equilibrium exchange rate.

- The external capital has a significant negative impact on the equilibrium exchange rate.

In the light of all the foregoing, it is true that this study has done output the determinants of the equilibrium exchange rate, it ignores the Exogenous Shocks and psychological factors that can influence the exchange rate of the balance of the Tunisia.

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Financial Deepening-Economic Performance Nexus, 
An attempt to Study Granger-Causality through Spectral Time Series Analysis in MENA Countries

Abstract

In this paper it is considered that the series may have a repetitive or cyclical behavior across time by referring to the Fourier analysis; which is an important part in the modern treatment of Economic Time Series. The goal of this is to test the causality Granger between financial deepening and economic performance in MENA countries using the spectral analysis that is a special case of the Fourier analysis; according to different time horizons (short, medium and long term) without subdividing the study period which extends from 1970 to 2014. For reliable results, the sample was divided into two subsamples, the countries of the Gulf Cooperation Council (GCC), which have a high income, and other countries.

On high frequencies, estimates show that the real and financial sectors maintain causal relationships, showing a limit of the conventional method of causality assessment that sets in many cases a complete lack of connection between the proxies. In the long term, finance dominates in some Gulf Cooperation Council (GCC) countries while we have the opposite effect in other countries.

The main conclusion that one can reach is that the causal relationship between finance and growth is not linear, but it varies depending on the chosen time horizon.

Keywords:
I. Introduction

The studies on the relationship between finance and economic growth often use multivariate linear models such as vector autoregressive models (VAR models) and vector error correction models (VECM models) and operate the entire period. However, it is known that the economic environment in a given country is not the same throughout the study period and the results that can be found may be wrong. Indeed; there are exogenous factors beside the endogenous factors that may influence the finance and economic growth nexus, especially in developing countries. Include, among others, political instability in these countries, their relationship with international bodies (IMF and World Bank), and climatic conditions and so on...

And to study this relationship, it makes more sense to decompose the study period into sub-periods according to the given economic context. In this regard, Granger and Lin, 1995 and Breitung Candelon (2006) reported that links between different phenomena are not linear, but vary depending on the selected frequency bands. The decomposition of the study period into sub-periods has the inconvenience of reducing the number of observations that would question the robustness of the statistical tests based more often on asymptotic properties. Spectral analysis overcomes this disadvantage by measuring causality following different frequencies while keeping all observations of the study period in each of these frequencies.

However, what about the choice of sub-periods? ; Otherwise, how to bring up any form of periodicity in the movements of macroeconomic series?

For a long time classical decomposition of these movements into four components (trend, seasonality, cyclical motion and random movement) has used classical techniques of descriptive statistics. If determining the trend and seasonal movement is relatively simple, that of the cyclic movement is more complicated because it requires the subtraction of the two previous movements. This led to seek more sophisticated methods to highlight the cyclical component representing in some cases the fundamental element that generates the data generating process.
Early research in this area has used the harmonic analysis method. This method consists in adjusting a periodic function to the observed series. But the nature of time series is generally characterized by imperfect periodicity (which is always true for macroeconomic data), which leads to a limit of application of applying this method.

To solve this problem researchers are oriented towards spectral analysis, which is an extension of harmonic analysis that studies the time series in the frequency domain by replacing the time domain. It consists to research solution from trigonometric functions that are composed of several sinusoids and each has its own frequency and therefore its own periodicity. This method has a better fit of the data as it is based on the sum of partial periodic functions. These are two ways of representation and study of stationary data that are not opposite, but complementary. The transition from one representation to another is performed by Fourier transforms through the spectral representation theorem, which states that "any stationary in covariance process can be decomposed into a sum of sinusoidal oscillations whose amplitudes and offsets are independent random variables of a sine wave to the other"

The rest of the article is organized as follows, Section 2 presents the literature review, section 3 focuses on the model and the estimation method, empirical validation shall be presented in Section 4 and Section 5 concludes.

II. Literature revue

The theory of the business cycle has developed in the last century by the famous work of Juglar, Schumpeter (Schumpeter, 1939, 177), one of the greatest economists of all time. Juglar stresses the need to find the causes of the recession in the phases of prosperity.

The economic cycle is a concept relatively complex and raises multiple and difficult issues.

Detection of economic cycles is usually based on a decomposition of the time series into a trend, and cyclical components. This approach is not sitting on uniform and indisputable theoretical foundations; however, two approaches are imposed. The first approach is based on economic theories or structural models in which the different relationships have generally accepted economic interpretations. On the
contrary the second approach is based on neutral statistical and analytical tools and then seeks to find economic explanations for the various components of economic dynamics.

The present research methodology is purely instrumental and constructivist, it is based on spectral analysis and rather it is in line with the second approach.

The spectral analysis of time series in the economic field dates back to Granger and Morgenstern (1962). The works that followed them were interested in seasonal phenomenon (Nellore (1964) and general spectral structures of economic time series, Granger (1966). The cospectral methods, including coherence and phase are subsequently used to quantify the relationship between economic variables, one among them to evaluate the presence of linear relationship between series and the second to measure their time offset.

Geweke (1984, 1986) proposed a simpler method using tests based on the coefficient of determination. He applied the tests on the causal relationships between the gross domestic product growth (GDP) and the money supply on the one hand, and between the GDP growth rate and the GDP deflator in the US economy over the period 1929-1978, on the other hand.

For example, Gronwald (2009), in a study of causality between oil prices and economic and financial variables, showed that there is a short-term causal relationship between oil prices and the interest rate to short term and the consumer price index; at low frequency (long term), the author has shown a significant causal relationship between oil prices and the long-term interest rates; he found a total lack of causality between the oil price and industrial production on the one hand, and between oil prices and the unemployment rate on the other.

Through the bivariate and multivariate spectral analysis on US macroeconomic data from 1959 to 1997, Hart et al. (2009) suggest a cyclical behavior of the change in gross domestic product, employment and wages for a period of five to seven years. Finally, they found a pro-cyclical movement between the product level and the index of consumer prices, particularly in the period 5-7 years. Similarly, Aguiar-Conrraria and Soares (2010) have established an unstable relationship between oil prices and industrial production, according to the frequencies, with a form of alternation in the causality between the two variables. By combining the Wavelet Method to the frequencies analysis, they also show that the inflation
rate and the growth rate of industrial production follow pro-cyclical movements of decrease from 1950 and 1960.

Based on the frequencies approach, Breitung and Candelon (2006) have shown that the spread (difference between the interest rates of long and short term) in the short term is an explanatory factor for the change in US GDP. Furthermore, their study examines the property of finished samples by Monte Carlo simulations. Hosoya (1991) has also developed Frequency causal measures applied to stationary data comparable to those of Geweke (1982); starting with the measurement of the amount of information Gel'fand and Yaglom (1959).

Yao and Hosoya (2000) have extended this approach to "unilateral causal study applied to cointegrated time series. Thus, the Johansen approach to estimating the maximum likelihood cointegration was adopted as the likelihood-ratio test. And that furthermore, their method also provides a confidence intervals construction procedure using Dewald statistical tests (1943). By studying Japanese macroeconomic data; these authors have found:

- A lack of causality between money supply and GDP in the short term,
- Significant influence of interest rates on GDP while the reverse causality is very low,
- A significant contribution of exports to GDP,
- A low incidence of the money supply on exports,
- An important impact of imports and exports on the money supply and interest rates.

In some Granger multivariate causality studies, and for certain frequency band values, Chen et al. have shown that the spectral method can lead to negative statistics that are difficult to be interpreted. They propose a matrix of partition method to overcome this problem. However, it is important to note that the spectral approach remains more a descriptive analysis tool than a recognized method for forecasting. It remains also a powerful tool for the cyclical study, and measuring the contribution of one variable to change other variables.
III. Econometric method

1. The econometric model and Fourier transformation

In the following development, the financial deepening variable is denoted by X, the economic growth variable by Y and we assume an unconstrained model:

\[ \begin{align*}
\text{a}_1\text{X}_{t-1} + \text{a}_2\text{Y}_{t-1} &= \text{u}_t, \\
\text{a}_3\text{X}_{t-1} + \text{a}_4\text{Y}_{t-1} &= \text{v}_t
\end{align*} \]

\[ \leftrightarrow \begin{align*}
\text{a}_1(\text{B})\text{X}_t + \text{a}_2(\text{B})\text{Y}_t &= \text{u}_t, \\
\text{a}_3(\text{B})\text{X}_t + \text{a}_4(\text{B})\text{Y}_t &= \text{v}_t
\end{align*} \]

- \( B \) is the lag operator;
- \( \text{a}_1(0) = 1, \quad \text{a}_2(0) = \text{a}_3(0) = \text{a}_4(0) = 0; \)
- \( \text{u}_t \) and \( \text{v}_t \) are random variables;
- \( \text{E}(\text{u}_t) = \text{E}(\text{v}_t) = 0; \)
- \( \text{V}(\text{u}_t) = \sigma_u^2, \quad \text{V}(\text{v}_t) = \sigma_v^2 \), and \( \text{Cov}(\text{u}_t, \text{v}_t) = \sigma_{uv}; \)

To pass from the representation in time to that frequency requires the application of Fourier transforms of the equations. In the case of discrete data, we get the following relationships:

\[ \begin{align*}
\text{a}_1(\alpha)\text{X}(\alpha) + \text{a}_2(\alpha)\text{Y}(\alpha) &= \text{E}_x(\alpha) \\
\text{a}_3(\alpha)\text{X}(\alpha) + \text{a}_4(\alpha)\text{Y}(\alpha) &= \text{E}_y(\alpha)
\end{align*} \]

\[ \leftrightarrow \begin{pmatrix}
\text{a}_1(\alpha) \\
\text{a}_3(\alpha)
\end{pmatrix}
\times
\begin{pmatrix}
\text{X}(\alpha) \\
\text{Y}(\alpha)
\end{pmatrix}
= \begin{pmatrix}
\text{E}_x(\alpha) \\
\text{E}_y(\alpha)
\end{pmatrix} \]

\[ \leftrightarrow \text{A}(\alpha) \times \text{M} = \text{B} \]

The components of the latter matrix are the Fourier transforms of the coefficients of the time domain equations. \( \text{A}(\alpha) \) is called Fourier coefficient matrix.

\[ \text{a}_1(\alpha) = 1 - \sum_{j=1}^{p} \text{a}_{1j} e^{-iu_j} \]

\[ \text{a}_2(\alpha) = 1 - \sum_{j=1}^{p} \text{a}_{2j} e^{-iu_j} \]
\[ a_3(\alpha) = 1 - \sum_{j=1}^{p} a_{3j} e^{-ia_j} \]

\[ a_4(\alpha) = 1 - \sum_{j=1}^{p} a_{4j} e^{-ia_j} \]

\( \alpha \) is the fundamental Fourier frequency. We assume \( \alpha \in [0, \pi] \).

\[ A(\alpha) \times M = B \iff M = A^{-1}(\alpha) \times B \iff \begin{pmatrix} X(\alpha) \\ Y(\alpha) \end{pmatrix} = \begin{pmatrix} a_1(\alpha) & a_2(\alpha) \\ a_3(\alpha) & a_4(\alpha) \end{pmatrix}^{-1} \times \begin{pmatrix} E_x(\alpha) \\ E_y(\alpha) \end{pmatrix} \]

\[ \Rightarrow \begin{pmatrix} X(\alpha) \\ Y(\alpha) \end{pmatrix} = \begin{pmatrix} \frac{a_z(\alpha)}{\det A} & -a_2(\alpha) \\ -a_3(\alpha) & \frac{a_3(\alpha)}{\det A} \end{pmatrix} \times \begin{pmatrix} E_x(\alpha) \\ E_y(\alpha) \end{pmatrix} = \begin{pmatrix} F_{xx}(\alpha) & F_{xy}(\alpha) \\ F_{yx}(\alpha) & F_{yy}(\alpha) \end{pmatrix} \times \begin{pmatrix} E_x(\alpha) \\ E_y(\alpha) \end{pmatrix} \]

The spectral density denoted \( d \) of the Fourier transform can be written:

\[ d(\alpha) = \begin{pmatrix} F_{xx}(\alpha) & F_{xy}(\alpha) \\ F_{yx}(\alpha) & F_{yy}(\alpha) \end{pmatrix} \times \begin{pmatrix} \sigma_u^2 & \sigma_{u,v} \\ \sigma_{v,u} & \sigma_v^2 \end{pmatrix} \times \begin{pmatrix} F_{xx}(\alpha) & F_{yx}(\alpha) \\ F_{xy}(\alpha) & F_{yy}(\alpha) \end{pmatrix}^\dagger = \begin{pmatrix} d_{xx}(\alpha) & d_{xy}(\alpha) \\ d_{yx}(\alpha) & d_{yy}(\alpha) \end{pmatrix} \]

Note: \( \dagger \) means the transposed matrix

The interdependence to the frequency \( \alpha \) between \( X \) and \( Y \) is measured by the following report:

\[ R_{XY} = \ln \left| \frac{d_{xx}(\alpha) \times d_{yy}(\alpha)}{d_{xx}(\alpha) \times d_{yy}(\alpha) - d_{xy}(\alpha) \times d_{yx}(\alpha)} \right| \]

Indeed, the spectral density contains the spectra of each variable and the cospectrum of \( X \) and \( Y \). The cospectrum shows whether the \( X \) and \( Y \) variables are dependent or not.
If X and Y are independent, then the determinant of the density $d(\alpha)$ is the product of individual spectra, the cospectrum being null.

When X and Y are independent, $R_{xy}$ can be written:

$$R_{x,y} = \ln \left[ \frac{d_{xx}(\alpha) \times d_{yy}(\alpha)}{d_{xx}(\alpha) \times d_{yy}(\alpha) - d_{xy}(\alpha) \times d_{yx}(\alpha)} \right] = \ln \left[ \frac{d_{xx}(\alpha) \times d_{yy}(\alpha)}{d_{xx}(\alpha) \times d_{yy}(\alpha) - d_{xy}(\alpha) \times d_{yx}(\alpha)} \right]$$

(6)

### 2. Granger causality measure

We know that according to Granger (1969):

- The variable Y Granger causes X at time t, if and only if:
  $$E(X_t | \tilde{X}_{t-1}, \tilde{Y}_{t-1}) \neq E(X_t | \tilde{X}_{t-1})$$

- The variable Y instantaneously Granger causes X at time t, if and only if:
  $$E(X_t | \tilde{X}_{t-1}, \tilde{Y}_t) \neq E(X_t | \tilde{X}_{t-1}, \tilde{Y}_t)$$

Where $\tilde{X} = \{X_t, X_{t-1}, \ldots\}$ and $\tilde{Y} = \{Y_t, Y_{t-1}, \ldots\}$ indicate the past of X and Y.

In the case of spectral analysis, the measurement of the unidirectional causal requires the decomposition of the spectrum of each series, this process is called normalization.

The decomposition of X-spectrum is given by:

$$d_{xx}(\alpha) = F_{xx}(\alpha) \times \sigma_u^2 \times F_{xx}^\dagger(\alpha) + 2\sigma_{uv} \left[ F_{xx}(\alpha) \times F_{xy}^\dagger(\alpha) \right] + F_{xy}(\alpha) \times \sigma_v^2 \times F_{xy}^\dagger(\alpha)$$

(7)

- The term $F_{xx}(\alpha) \times \sigma_u^2 \times F_{xx}^\dagger(\alpha)$, represents the intrinsic part of the causal relationship;
- The second term indicates the instantaneous causality,
- and the third term indicates the causal effect of X on Y due to $\sigma_v^2$.

Finally, the causal effect on x generated only by Y, is obtained by canceling the second term.
To find the causal effect on Y generated by X, we reason from the same way. The decomposition of X- spectrum is given by:

\[
\alpha \sigma_{\alpha}^2 F_{\alpha}^\top (\alpha) + 2 \sigma_{\alpha \mu} \left( F_{\alpha \mu} (\alpha) \times F_{\alpha}^\top (\alpha) \right) + F_{\mu} (\alpha) \sigma_{\mu}^2 F_{\mu}^\top (\alpha)
\]  

\( (8) \)

**IV. Empirical validation**

1. **The data**

The study period runs from 1970 to 2014. The sample studied contains 20 MENA countries including six GCC countries: Algeria, Bahrain, Djibouti, Egypt Arab Rep., Iran Islamic Rep., Iraq, Jordan, Kuwait, Lebanon, Libya, Malta, Morocco, Oman, Qatar, Saudi Arabia, Syrian Arab Republic, Tunisia, Yemen Rep., West Bank and Gaza.

The sample will be divided into two subsamples. i.e. the GCC: Saudi Arabia, the UAE, Bahrain, Oman, Qatar and Kuwait, and other MENA countries. This division is justified by the fact that the GCC countries hold nearly half of global oil reserves, its GDP reached $1,619 billion in 2015, have a per capita income quite high compared to other countries that exceed $30,000 and they have established a customs union and a common market in 2015.

The variables used to measure financial deepening and economic performance are successively, the natural logarithm of credit to the private sector relative to gross domestic product (lnCREDIT) and the natural logarithm of gross domestic product per capita growth rate (lnGDP). These variables are transformed into first differences in the aim of making stationary.

The data are from the World Development Indicators (WDI) and the IMF international financial statistics database.

2. **Results of the Granger causality test**

In this causal study:

- We consider annual periods: denoted T
- The zero hypothesis H0 is that there is no unidirectional causality at T period, between the
variables of interest.

- \( \alpha = \frac{2\pi}{T} \), represented the Fourier fundamental frequency.

### Table 1. Granger causality in frequencies in GCC countries

<table>
<thead>
<tr>
<th></th>
<th>H0: lnCREDIT does not cause lnGDP</th>
<th>H0: lnGDP does not cause lnCREDIT</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>( \pi )</td>
<td>( \frac{\pi}{2} )</td>
</tr>
<tr>
<td>( T )</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Saudia Arabica</td>
<td>0.102**</td>
<td>0.023*</td>
</tr>
<tr>
<td>UAE</td>
<td>0.035*</td>
<td>0.024*</td>
</tr>
<tr>
<td>Bahreïn</td>
<td>0.124</td>
<td>0.124*</td>
</tr>
<tr>
<td>Oman</td>
<td>0.025**</td>
<td>0.083</td>
</tr>
<tr>
<td>Qatar</td>
<td>0.142*</td>
<td>0.127</td>
</tr>
<tr>
<td>Kuwait</td>
<td>0.111*</td>
<td>0.033</td>
</tr>
</tbody>
</table>

**Notes:** asterisks *, * and *** successively meaning the rejection of H0 at the 10%, 5% and 1% significance levels
Table 2. Granger causality in frequencies in the rest of MENA countries

<table>
<thead>
<tr>
<th>Country</th>
<th>H0: lnCREDIT does not cause lnGDP</th>
<th>H0: lnGDP does not cause lnCREDIT</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>α</td>
<td>π</td>
</tr>
<tr>
<td>Algeria</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Djibouti</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Egypt Arab Rep.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Iran Islamic Rep.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Iraq</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jordan</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lebanon</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Libya</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Malta</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Morocco</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Syrian Arab Rep.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tunisia</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yemen Rep.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>West Bank and Gaza.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes: asterisks *, ** and *** successively meaning the rejection of H0 at the 10%, 5% and 1% significance levels.
By reading the above tables it can be noted that there are significant causality tests from finance to economic growth in high and low frequencies in the case of the GCC countries except Oman. This result is not surprising, if we know that Oman is the poorest country in the GCC and has been classified a high-risk countries according to the 1st quarter 2016 report of the credit insurer Euler Hermes.

In the case of Saudi Arabia, the results indicate that there is long-term (or low frequency) bidirectional causality at a significance level of 5%. We find the same result for Morocco but in the short term (2 years, 4 years). This can be explained by the fact that Morocco is the only country in the region that is relatively stable and has benefited from the disturbed situation in other MENA countries notably Tunisia. Indeed, flows of foreign capital and Morocco's exports were increased in an exceptional manner after the Arab Spring.

For non-member countries of the GCC, the causal relationship between financial deepening and growth vary across periods. In the case of Tunisia, Malta, Lebanon and Jordan, we note that, finance dominates economic growth in the long term or at lower frequencies (more than 4 years or $\alpha = \frac{\pi}{2}$) with a statistically significant level lower than 10%. In the short term this relationship is reversed but it becomes more important. The same trends emerge, in the short term in the case of Egypt, Algeria and Iran. For the remaining countries results are diversified.

3. Results analysis

The results highlight that, the intensity and direction of relationship between finance and growth vary according to the frequency. Sometimes this relationship is not present; and if there is a relationship the direction of causality can be unidirectional (from finance to growth, or from growth to finance) or bidirectional.

These findings challenge the conventional results according to which the relationship between finance and growth is linear. Thus, the reality is that this relationship may be influenced by many factors, and can take any shape.

The causal relationship ranging from finance to economic performance for some of the GCC countries can be explained on one side by the fact that these countries have a sizeable financial potential, on the flip
side by the greatest performance credits bank in this area. These effective credits are intended to finance companies that operate in sectors with high added value such as the oil sector.

In the rest of the MENA countries, the direction of causality is reversed for most of them, it becomes from economic growth to finance. This can be explained on one hand by political instability, which would result in the reduction of the entry of financial flows and the increase in capital flight. Indeed, in the Euler Hermes report- first quarter 2016, Only Morocco and the GCC have been rated low-risk countries. On the other hand by the relatively high level of inflation, this will increase nominal interest rates and decrease real returns on financial assets. In that case, as pointed Wachtel and Rousseau (2000), investors will be forced to acquire very liquid assets and thus invest less in projects that potentially generate a kind gross capital formation and growth.

V. Conclusion

The main of this study is to show the limitations of traditional methods that have sometimes showed a total lack of links between financial variables and economic variables. For this purpose, a spectral analysis of causality between financial deepening and economic growth in MENA countries with different time horizons has been performed, the results highlight that this causal relationship is not linear but depends on the frequencies considered.

To get homogeneous data sources, the sample was divided into two subsamples, the countries of the Gulf Cooperation Council (GCC), which have a high income, and other countries.

The results indicate that causal relationships differ across countries. Indeed, the results show that financial deepening as measured by credit to the private sector; long term Granger causes economic performance in the GCC region, while for the rest of the MENA countries, economic performance precedes financial development. In the short term outcomes are not the same. They are reversed or indicate the presence of a bilateral causality.

Against King-Levine (1993 b) and Calderon -Liu (2003), for which finance dominates growth in developing countries; the present study has shown that there is not a single structure linking these two variables, which is valid for all countries and all times. The main conclusion that one can reach is that
each country has its economic and financial reality and must know how to conjugate them to ensure sustainable development.

References


Does the Environment Kuznets Curve exist in Singapore?

Abstract
The Environment Kuznets Curve (EKC) shows that there exists an inverted ‘U’ relationship between indicators of environmental degradation and economic growth. This means that environmental degradation first increases (worsens), and then decreases as per capita income increases. The hypothesis is tested for the case of Singapore. The paper finds that Granger causality flows from export performance, trade intensity and energy consumption to CO\textsubscript{2} emission, and the EKC exists in the long run, but not in the short run.

Keywords:
environment, Singapore

Introduction
There was a sense of extreme vulnerability following Singapore’s split from the Malaysian Federation in 1965 as it seemed unlikely that Singapore would be able to survive as a city along with no hinterland and no natural resources. Singapore not only survived as a nation state. Under the leadership of the pioneer generation of the People’s Action Party (PAP), Singapore solved many problems such as communism and high unemployment rate, and experienced rapid economic growth. Singapore has transformed from a trading port of primary products to an international transportation and logistics hub, a financial entrepot, a centre for international tourism, education and medical centres, and from a third world country to a first world country.

As the industrial base grew to include chemical and electronic industries, Singapore understood that it had to take into consideration the adverse effect of industrialization on the quality of environment. In April 1970, the Anti-Pollution Unit (APU) was formed. Established under the Prime Minister office, the APU has regulatory power to reject industries deemed to be too polluted from operating in Singapore (Tan, 2008). The Clean Air Act was passed in 1971 to prevent and controlling air pollution. The stringency in effluent and emission regulations was deemed necessary as local companies tend to view environmental protection as a deterrent to profit generation (Perry and Singh, 2002). The Ministry of Environment was later instituted in 1972, and took over the task of cleaning up the Singapore River and Kallang Basin Catchment.¹

¹ In 2004, the Ministry of Environment was renamed as the Ministry of the Environment and Water Resources (MEWR) to reflect its expanded role to include water management.
The economic development model of Singapore has been well documented [see, for example, Huff (1994) and Low (2001)]. This paper aims to find out whether the Environment Kuznets Curve (EKC) exists in Singapore. The EKC hypothesizes the existence of an inverted ‘U’ relationship between indicators of environmental degradation and economic growth. This means that environmental degradation first increases (worsens), and then decreases as per capita income increases. Several empirical results suggest that EKC exists (World Bank, 1992; Shafik and Bandhyopadhyay, 1992; Seldon and Song, 1994; Grossman and Krueger, 1995; Stern, Common and Barbier, 1996; Cole, 2003; Frankel and Rose, 2005; Ahmed and Qazi, 2014; Shahbaz et al, 2014). Our results show that Granger causality flows from export performance, trade intensity and energy consumption to CO₂ emission, and the EKC exists in the long run, but not in the short run in Singapore.

The Case of Singapore

Singapore is a small island developing state, sharing many of the characteristics of the pacific islands including dense population and small physical space. Although the city state is largely protected from hurricane and other natural disasters, rising sea level is a matter of concern. As Ng and Mendelsohn (2005) have showed, sea level inundation could lead to loss of dry land of up to 17 sq km (2.7% of the Singapore’s total land area). Singapore has constructed sea walls and put in place a good drainage system to keep the sea out.

Without any significant agricultural land or landfill sites, Singapore does not emit significant amount of methane gasses. Carbon dioxide (CO₂) is the primary greenhouse gas emitted in the city state, resulting from the use of fossil fuels in power generation and the industrial, transport and commercial and residential sectors. As shown in Figure 1, CO₂ emission in the city state has been on a rising trend averaging 11.46 metric tons per capita in the 1980s before stabilizing at an average of 14.26 metric tons in the period 1990-2005.

Figure 1: Annual CO₂ emission (1981-2005)

Much of Singapore’s land is less than 15 metres above sea level (ENV, 2000: 31).
Source: World Economic Outlook Database, October 2008, International Monetary Fund (IMF)

**Figure 2: CO₂ emission versus GDP per capita (selected countries)**


Figure 2 considers the small island countries as classified by the United Nations (n = 42). Comparatively, Singapore was ranked as the fifth highest emitter of CO₂, and second in terms of GDP per capita, after British Virgin Islands. Accounting for only 0.2% of global CO₂ emission, Singapore adopts a pragmatic approach and will do its “fair share as part of a collective global effort” (Phua, 2008). Singapore’s position is that it could not volunteer to reduce its emissions at the cost of economic growth if other countries fail to do their part. In the run up to the summit at Copenhagen in 2009, Singapore committed to cut greenhouse gas emissions by 16% by 2020 but she made it clear that this would take effect only if all countries cut emissions and if other countries offer significant pledges. Singapore’s commitment pales in comparison with the 40-50% cut committed by China but aligns closely with the United States declaration to reduce U.S. greenhouse gas emissions by 17% of 2005 levels by 2050 under the Waxman-Markey American Clean Energy and Security Act of 2009.¹

To this end, Singapore has acceded to the Kyoto Protocol. The decision has been described as a significant shift in Singapore’s policy towards CO₂ emission, from denying its obligation to set emission target as it clings on to its developing country status to the announcement of putting in place a plan to reduce carbon intensity. It has been argued that Singapore’s decision to accede to the Kyoto Protocol was purely nationalistically orientated “to protect the country’s international image and to benefit from the economic opportunities that the protocol opens up” (Hamilton-Hart, 2006: 375).

¹ As Singapore puts it, this was largely due to the higher base level. ‘Singapore to pledge 16% cut in gas emissions’, *The Straits Times*, 3 December 2009.
Empirical Results

This paper considers the relationship between the level of CO₂ emission, economic performance, trade openness and energy consumption for Singapore. The annual data used in this study are obtained from World Bank’s World Development Indicators, for the period from 1971 to 2011. The use of CO₂ rests on the fact that the gas accounts for over half of the effect of global warming.

Equation (1) establishes the dynamic relationship between CO₂ emission, economic performance, trade openness and energy consumption.

\[ C_t = f(Y_t, Y_t^2, X_t, E_t) \]  

(1)

In the equation, C is CO₂ emission per capita, Y is GDP per capita, \( Y_t^2 \) is GDP square per capita, X measures the total trade volume per capita and E represents energy use (kg of oil equivalent) per capita.

Equation (1) can be converted to the log linear equation as shown below:

\[
\ln C_t = \beta_0 + \beta_1 \ln Y_t + \beta_2 (\ln Y_t)^2 + \beta_3 X_t + \beta_4 E_t + U_t
\]

where U is the error term. The EKC postulates that \( \beta_2 < 0 \).

The time series properties of the variables are examined using two unit roots test – the augmented Dickey-Fuller test and Phillips-Perron test – for the null hypothesis of non-stationary. Table 1 shows the results for the test on non-stationary, suggesting that the series are integrated of order one, I(1). This implies the possibility of cointegrating relationships.

Table 1: Unit roots tests results

<table>
<thead>
<tr>
<th>Variables</th>
<th>Augmented Dickey Fuller Test</th>
<th>Phillips-Perron Test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Level</td>
<td>First difference</td>
</tr>
<tr>
<td>ln C</td>
<td>0.0343</td>
<td>-8.4307*</td>
</tr>
<tr>
<td>ln Y</td>
<td>-2.4985</td>
<td>-4.7173*</td>
</tr>
<tr>
<td>ln ( Y_t^2 )</td>
<td>-2.4199</td>
<td>-4.5253*</td>
</tr>
<tr>
<td>ln X</td>
<td>-3.6920</td>
<td>-5.7073*</td>
</tr>
<tr>
<td>ln E</td>
<td>-1.7125</td>
<td>-7.2858*</td>
</tr>
</tbody>
</table>

Figures in the table show the t-statistics. The regressions are measured with trend and intercept term. * indicates rejection of null hypothesis of non-stationary at 1% significance level.

To test for cointegration, this paper uses the well-known methodology developed by Johansen (1991) who modeled the time series as a reduced rank regression. Equation 2 is estimated, and the residuals are used to compute two likelihood ratio test statistics: the trace and maximal eigenvalue tests.

\[
\Delta Z_t = \mu + \sum_{i=1}^{p-1} \Gamma_i \Delta Z_{t-i} + \Pi Z_{t-1} + \epsilon_t
\]

(2)

4 Jeffrey Sachs (2008: 37) has labeled CO₂ as the “most important greenhouse gas” affecting the Earth’s climate system.
Where \( Z_t \) is an \((nx1)\) column vector of \( p \) variables, \( \mu \) is an \((nx1)\) vector of constant terms, \( \Gamma \) and \( \Pi \) represent coefficient matrices, \( k \) is the lag length, and \( \varepsilon \sim N(0,\Sigma) \).

Table 2 provides the results for the Johansen cointegration test. The results suggest that there is at least one cointegrating equation among the variables.

### Table 2: Johansen Cointegration Test

<table>
<thead>
<tr>
<th>Number of cointegration equations</th>
<th>Trace Statistics</th>
<th>Maximum Eigenvalue Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>None*</td>
<td>96.84439</td>
<td>39.21114</td>
</tr>
<tr>
<td>At most 1</td>
<td>57.63324</td>
<td>23.75009</td>
</tr>
<tr>
<td>At most 2</td>
<td>33.88316</td>
<td>16.45690</td>
</tr>
<tr>
<td>At most 3</td>
<td>17.42626</td>
<td>10.25048</td>
</tr>
<tr>
<td>At most 4</td>
<td>7.175772</td>
<td>7.175772</td>
</tr>
</tbody>
</table>

* denotes rejection of the hypothesis of zero number of cointegration equation at 5% significance level.

The existence of cointegration implies that an Error Correction Model (ECM) specification is appropriate. Table 3 shows the results of Granger causality based on ECM, and it indicates the existence of a long-run relationship between \( CO_2 \) emission and economic performance, trade intensity and energy consumption. More specifically, the coefficient of \( Y^2 \) is negative and significant, implying that the EKC exists in the case of Singapore. The Singapore’s case shows that as economic performance increases, the quality of the environment as measured by \( CO_2 \) emission first increases, and then falls.

### Table 3: Vector Error Correction Model Estimates

<table>
<thead>
<tr>
<th>Variables</th>
<th>Coefficient</th>
<th>t-statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Long-run estimates</td>
<td></td>
<td></td>
</tr>
<tr>
<td>( Y )</td>
<td>4.9288</td>
<td>2.1797*</td>
</tr>
<tr>
<td>( Y^2 )</td>
<td>-2.8429</td>
<td>-2.6251*</td>
</tr>
<tr>
<td>( X )</td>
<td>-0.8819</td>
<td>-2.9646*</td>
</tr>
<tr>
<td>( E )</td>
<td>-0.5717</td>
<td>-3.2002*</td>
</tr>
<tr>
<td>Constant</td>
<td>57.6001</td>
<td></td>
</tr>
<tr>
<td>Short run estimates (lagged-difference)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>( ECM )</td>
<td>-0.3303</td>
<td>-1.7260**</td>
</tr>
<tr>
<td>( C )</td>
<td>-0.0892</td>
<td>-0.4118</td>
</tr>
<tr>
<td>( Y )</td>
<td>1.9389</td>
<td>0.3227</td>
</tr>
<tr>
<td>( Y^2 )</td>
<td>-0.9641</td>
<td>-0.3231</td>
</tr>
<tr>
<td>( X )</td>
<td>0.1612</td>
<td>0.3851</td>
</tr>
<tr>
<td>( E )</td>
<td>0.2030</td>
<td>0.7862</td>
</tr>
<tr>
<td>Constant</td>
<td>-0.0248</td>
<td>-0.2573</td>
</tr>
<tr>
<td>Diagnostic test</td>
<td>P-value</td>
<td></td>
</tr>
<tr>
<td>Heteroscedasticity</td>
<td>0.5412</td>
<td></td>
</tr>
<tr>
<td>LM Serial Correlation</td>
<td>0.5728</td>
<td></td>
</tr>
</tbody>
</table>

*, ** significant at 5% and 10%, respectively.
The coefficient for X is negative and significant, suggesting that trade reduces pollution level through innovation and empowerment of the consumers to demand cleaner production of goods and services. Trade promotes a reduction in pollution through economic growth, ‘accelerated innovation, an international ratcheting up of standards, empowerment of the consumers, or some other channels’ (Frankel, 2005: 11). This may represent one part of the inverted ‘U’ Environment Kuznets Curve (EKC) which stipulates the worsening of environmental degradation in the early stage of developed followed by improvement in the later stage.

The coefficient for E is negative and significant. It implies that the increase in energy consumption has not led to more emission of CO₂. One possible explanation is that Singapore has relied extensively on piped natural gas and liquefied natural gas in meeting its energy needs. Natural gas generates 95% of the electricity in Singapore, up from 26% in 2001, and the growth is largely driven by technology advancements in transportation, availability of the resource from Malaysia and Indonesia and lower cost of production. The results suggest that the declined in carbon intensity energy production has reduced CO₂ emission from power generation.

It is also worth noting that the lagged ECM term is statistically significant, implying that past equilibrium errors affect current outcomes. However, there is no evidence of short run causality running from Y, X and E to CO₂ emission.

**Concluding Remarks**

This paper considers the relationship between economic performance and environmental quality, and in particular the Environment Kuznets Curve (EKC) hypothesizes, which states the existence of an inverted ‘U’ relationship between indicators of environmental degradation and economic growth. It contributes to the literature by testing the EKC hypotheses in Singapore by using cointegrated vector autocorrelation method.

Many people are hopeful that urbanization, industrialization and other processes of economic development will bring a better tomorrow. This paper lends support to that hope. Using the case of Singapore, this paper finds that while initial economic progress has led to worsening of the environmental problem, continued strong economic performance in the long run has the effect of reducing CO₂ emission. In this regard, pressure on the environment exerted by growth induced factors is justified so long as the environmental degradation does not exceed the threshold irreversible level. The perception that economic growth is not necessary harmful to the environment lends support to the proposition to push ahead their growth agenda and search for sources of economic growth.
References


Medical Representative in Bangladesh: a Job with Different Pattern

Abstract
Pharmaceutical industry is one of the progressive sectors in Bangladesh economy and medical representatives play important role in achieving the company sales target. There is paucity of literatures in this field. Therefore, it was aimed to describe the daily job life of a medical representative based on close observations. Authors gained insights from unstructured interview of medical representatives, marketing personnel, training department personnel of the representative and top executives of pharmaceutical companies. Medical representatives are working with intense sales pressure, very little holiday, huge job insecurity and very little time to be with family in a biphasic job schedule. This article will provide a glimpse to the job seekers to compare their options and hope to draw attention of the policy makers to make the job more attractive.

Keywords: Pharma marketing, Medical Representatives, Reps, Bangladesh

Introduction:
Pharmaceutical industry is one of the progressive sectors in Bangladesh economy [1,2]. It contributes 1% to the country’s GDP and is the third largest industry in terms of contribution to government revenue [1, 2, 3]. The current market size is about 12,100 million with having almost persistently double-digit growth [2]. The market is almost self-sufficient in meeting local demand as 97% of the drugs are manufactured locally and is exporting to 92 countries [1, 3, 4]. There are 267 licensed pharmaceutical companies in Bangladesh for manufacturing the pharmaceutical products [1, 2, 4]. The market is principally driven by the prescriptions of doctors, and company personnel try to motivate doctors to prescribe their own company brands by personal selling, clinical meetings, seminars, symposia, etc. [1]. Medical representatives regularly make sales call to doctors by sharing scientific information and competitive advantages of their products over the competitors. During prescription preparation doctors consider such factors and use brand names for treatment and patients buy the prescribed brands to raise sells of their products.
respective brands [1, 5, 6]. There is paucity of literatures in this field; therefore, it was aimed to describe the daily job life of a medical representative based on close observations.

Methods:

Authors gained insights from unstructured interview of medical representatives, marketing personnel, training department personnel of the representative and top executives of pharmaceutical companies. Authors also have insight from experiences of having working as a sells, marketing and training executive as well as experiencing of daily calls from representatives during chamber practice.

Description:

Medical sales representatives, commonly known as 'reps' are a strategic link between healthcare professionals and pharmaceutical companies. They promote the sale of the products manufactured by their employer companies. The products include medicines, prescription drugs and medical equipment, which are being promoted to a wide range of professionals from pharmacists and nurses to general practitioners and hospital doctors. They work very tactfully to increase the awareness and use as well as sells of promoted products.

Recruitment:

During recruitment employers prefers science graduates with relaxation the criteria on the basis of experience and company ranking. After recruitment, usually employers train them to be presentable in regards to the company marketing policy, which is mostly dominated by marketing and human resource department. After successful training period, reps are appointed in the vacant territory of the company, provided with sample carrying bag, motorbike, mobile handset and a SIM card. The graduates in the field of life sciences, pharmacy, medicine, nursing and dentistry get extra attention while the appointment as a rep. A business or marketing degree may also be helpful, especially if accompanied by some knowledge of medical sales.

Daily work:

Unlike the other jobs, reps are bound to pass a very busy life and they have to perform bi-phasic duty. Phase-1 starts at 8 am, when they have to report their bosses for daily work plan as well as previous day sells and call performance for about half to one hour. Then, they move to their working institutional gate to convey greetings with their fixed physicians while they enter into their offices in the morning. After that, they prepare themselves adequately to make calls to the targeted physicians with targeted products by detailing or presenting materials supplied by marketing department of the company. During entering into the physician’s chamber for making a call, most of the time, they have to satisfy the attendant of the physician, gatekeeper of the hospital, sister attending the physicians and others who have accessibility to the physicians to the extent of motivation. Usually morning shift ends around 2 pm with completion of communications with the pharmacy man to ensure their persistent sells order adjacent to the institute. The
second phase starts at 5 pm with reporting to the supervisor followed by taking sells orders from the pharmacy man. At this phase, they have play very crucial role to satisfy the order-giving persons as they have immense role on selling their products. In Bangladesh pharmacy men play a significant role as they can routinely change the brand of the prescribed product so, they used to take tolls from the company people specially from the reps. Then, their responsibility is to make calls to their fixed doctors with prioritized brands in accordance to the physicians preferable time. Usually, this phase ends at about 11 pm. Regarding holiday, they usually get 1 or 2 holidays in a month as because they have to visit the weekly visiting physicians in the weekends. In Bangladesh, physicians have a tendency to run holiday chambers remote from their working institute and for this holiday chambers they can promote the prescription drugs immensely.

**Overall Life:**

In Bangladesh, their life is not so smooth and their job satisfaction not very high [1]. They have to work with very strict sales target, which is often refreshed monthly and a constant push from the marketing department of the company. Nevertheless, they poor have their job security [1]. If they can’t reach the target, they are transferred to another section and sometimes may lose their job.

Their process of selling involves getting in touch with the potential customers and detecting their necessities. They do not sale products directly to buyers as the vendors do, rather patients pay for prescription drugs and physicians control their access [5, 6]. They persuade the physicians to prescribe particular drugs from their companies and ensure that they are following their guidelines. To keep the doctors motivated on their companies, they offer gifts adjusting with the rank, number of regular patients and social status of the physicians; on behalf of the company marketing strategy [1, 5]. It is firmly believed that increasing visits by medical representatives increase the prescription rate of a particular drug. They are trained well to assess physicians’ personalities, drug preference and practice styles. They remember the physicians’ family life, professional interests and important occasions to celebrate important occasions and thus keeping them motivated [6]. But the prescriptions are found to be influenced by a variety of factors. From the representatives’ perspective, prescriptions are mostly influenced by easy brand availability of the promoted drug, image of the company of which the promotion is being done and regular promotion of the representatives [3]. On the other hand, doctors prefer reliable scientific information and experiences gained from personal feedback on the drugs from the patients [2]. The harder to convince the physicians, the more pressure mounts on the medical representatives. The activities of medical representatives often helps in promoting local drugs as reflected in some studies as the greater the sale of the local drugs, the stronger the economy of the country [7]. Broadly, reps arrange appointments with doctors, pharmacists and hospital medical teams, which include pre-arranged appointments or regular ‘cold’ calling: make presentations to doctors and pharmacists in the retail sector. They also organize CMEs, conferences for doctors and other medical staff; building and maintaining positive working relationships with medical staff and supporting administrative staff; keep detailed records of all contacts; reach (and if possible exceeding) annual sales targets; plan work schedules and weekly, monthly timetables; regularly attending company meetings. They have be keep themselves up to date with the latest clinical data supplied by the company, and interpret, present and discuss this data with health professionals during presentations; monitor competitor activity and competitors' products; maintain
knowledge of new developments in the National Health Service (NHS), anticipate potential negative and positive impacts on the business and adapting strategy accordingly.

**Benefits:**

The profession provides benefits to the reps in different angles such as monthly fixed salary, incentives for target achievements, yearly bonus, quarterly bonus, trips for the achievers and other such monetary benefits that vary from a company to another company. The reps also get mobile allowances, transport allowances and other such field work related allowances. Companies arranges regular training for personal development of reps. Promotion to superior responsibility, salary and facility structure grossly vary from a company to another company. Many pharmaceutical companies are multinational, providing some opportunities to work abroad.

High commitment and low turnover intention culminate in favorable condition in an organization. Commitment depends on job satisfaction, motivation, organizational citizenship behavior and job performance [8]. As the pharmaceutical companies basically hard regarding sales target achievement from the medical representatives without considering their personal life, medical representatives are not completely satisfied in most cases [1].

**Conclusion**

Medical reps have important role on the company growth and they are working in a hyper competitive market in Bangladesh with intense sales pressure, very little holiday, huge job insecurity and very little time to be with family. There is paucity of literature regarding the life of medical reps in a country like Bangladesh. This article will provide a glimpse to the job seekers to compare their options and hope to draw attention of the policy makers to make the job more attractive.

**References**


Public awareness about e-tagging device on security Check posts & toll-plazas for the smooth traffic management and reduction in terrorist activities in Pakistan.

Abstract
This article reports on a qualitative study, which was conducted to identify the problems faced by the general public as well as the security agencies on check posts as well as toll plazas due to lesser use of E-Tag facility for smooth movement of traffic and reduction in terrorist activities. The sample of study consisted of all the twelve persons from different classes and professions, who shared their personal experiences about this issue. A structured interview with open-ended questions was used to investigate the problems of traffic and terrorist activities. Collected data were analyzed through (transcribing and coding) the statements given by the general public. It was found that there are some serious issues on both the ends of general public as well as security agencies to maintain terrorist free movement of traffic within and outside cities of Pakistan. It was surprising to find out that there is no public awareness campaign by the government to educated general public about the use of E-Tag facility on both print and electronic media. The problem of traffic jam as well as reduction in terrorist activities can be overcome by the extensive use of modern technology likewise cameras & scanners respectively.

Key words: Public awareness, Role of media, E-Tag facility, Use of modern technology, Terrorist activities.

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Published: 19-08-2016
Introduction:
Background of the Study
During the last few decades the population of Pakistan has been increased at sky-rocketing level. The resources are lesser than the means, which is the root cause for the whole disorder of the society. It is very common proverb that if you want to judge any nation then look at its traffic situation. Therefore it is commonly observed that even after the development of motor ways, high ways and main boulevards within and outside the cities of Pakistan the traffic situation is still unhygienic and disorganized. Due to which lot of traffic jams especially on toll plazas as well as security check posts to check terrorist activities. After US intervention in Afghanistan after 9/11 attacks the terrorist activities have been increased in Pakistan.

Statement of the Problem
The study was conducted to achieve the following objectives:

1. To investigate the problems regarding traffic jam on security check posts.
2. To know the usage of technology especially E-Tag facility for smoothening the traffic flow and reduction of terrorist activities.
3. To identify the barriers for not proper implementation of E-Tag facility on security check posts for the rapid identification of person as well as vehicle.

Purpose of the Study

1. What are the problems regarding traffic jam on security check post?
2. How satisfied the usage of technology especially E-Tag facility for smooth flow of traffic and reduction of terrorist activities?
3. What are the barriers for non proper implementation of E-Tag facility on security check posts for the rapid identification of person as well vehicle?

Significance of the Study
The significance of the study are twofold vis-à-vis the speedy identification of person as well as vehicles while passing through the security check posts in order to reduce terrorist activities and to maintain the smooth flow of traffic on these pickets accordingly.

Theory or Theoretical Perspective
In order to discuss the research paradigm and philosophical assumptions in this qualitative research the ontology means what is the nature of reality or what is knowledge? Multiple realities shaped by researcher’s prior understanding and assumptions of constructionism, which means researchers provide quotes to illustrate different perspectives. Epistemology is the relationship between the researcher and the being researched? What is regarding as acceptable knowledge and how we know it? Closeness means researchers visit participants at their sites to collect data. And it is based on the perceptions of the individuals about the world as Subjective. Axiology means what is the role of values? Biased means researchers actively talk about their biases and interpretations. Rhetoric is the language of research. In qualitative research the researchers write in literary, informal style. Methodology is the process of research. In an Inductive approach when researchers commence with participants views and build up to
pattern, theories and generalizations. Strategies of Inquiry are based on Grounded theory, ethnography, case study and narratives respectively. The methods in qualitative research are normally open ended questions, emerging approaches, and the text image analysis.

**Research Method**

In this research open ended questions have been asked from twelve persons from different professions and qualification levels during face to face interviews.

**Definition of Key Terms**

**Public awareness**

This is a generic term, which means to have knowledge about some person, place, thing, incident or event respectively. Normally it is the duty of the Government, Authorities, Local Bodies, Town, Tehsil, District, Club, Association of persons etc to launch public awareness schemes to educate general public about the new happenings.

**Role of media**

There are three types of Media vis-à-vis Electronic Media including Radio and TV similarly the other two are Print Media the Newspaper, Magazines, Journals and Social Media comprised of Facebook, tweeter, Skype respectively. In the today’s ear all these media are playing most vital role in everyone’s lives. These are the biggest sources of awareness to the general public at every level, castes, race, gender, religion and sect respectively.

**E-Tag facility**

This is actually an Electro-Magnetic bar code Tagging or called film, wherein whole the features of any product or service has been added to be detectable or readable through scanners. This is compact, cost and time saving device to handle voluminous or bulk of transactions in a mechanized and sophisticated manner.

**Use of modern technology**

In the ongoing era when everything is mechanized the slowly moving cart of the yester years has been replaced by fastest running car. So for the sake of reduction of terrorism in addition to the sniffing dogs the extensive use of modern technology like cameras, sensors and scanners need to be used, control, monitor and precisely implemented every public place especially security check post to safe guard sensitive Buildings, markets, bazaars, religious places, play grounds, Airports, Railway stations, educational institutions and Hospitals respectively.

**Terrorist activities**

Unofficial or unauthorized use of illegal activities as well as violence/intimidation in the pursuit of political aims there are many types of terrorist activities on the religion, sectarianism, culture, traditions, social and economic taboos and wars.
Delimitations

The research paper only the cantonment area Lahore is considered with reference to E-Tag facility of security check posts. I have collected the interviews of general public, but not visited the motor way police for getting information about E-Tag facility on motor way toll plaza. This is purely a qualitative research paper, so being a researcher my personal bias is also there as the data is not generalized on large no. of sample rather twelve respondents are considered for face-to-face interviews.

Limitations of the Study

E-Tag basically relates to Electronics. Therefore the devices have their specific mechanism, terminologies and jargons pertained to pure Physics and Electrical Engineering, which are different to understand and interpret without proper guidance of relevant persons of this profession. Non availability of precise and relevant literature in this area is another limitation. Similarly due to the strict rules and regulations of Pakistan Army especially their information department ISPR I couldn’t succeed to cater the interview of any on the job Army Official(s) for discussing the matter of Security Management on Army Pickets in Lahore Cantonment through E-Tag device. Qualitative Research is a time consuming job, so the time granted to conduct this research is too short to cover all the aspect and areas regarding security arrangement for the reduction of terrorism.

Summary

In this chapter we have discussed in brief about the topic, area and the purpose of the research. Similarly the key word or variables under observation have also been discussed for the better understanding of the reader or other researcher about this topic. And finally the limitation as well as delimitation of this research has been discussed in brief.

Literature Review:

Qualitative Research

As per Bickman and Rog (2009), the methods of qualitative research mean to explain the queries, problems and solution of human behavior, opinion and experience. The data and information, which is difficult to explore through quantitative research approach is researched over here. The branches of knowledge involved are anthropology, education, nursing, psychology, sociology and marketing regularly use qualitative methods to address questions about people’s ways of organizing and attaching to and relating with the world. The approaches of qualitative research as well as the research in general depend on personal, professional, political and cross textual factors. As such there is no hard & fast rule to conduct qualitative research in any project; it is the researcher point of view to examine the matter in his or her own perspective, Cook (2000).

Review of Related Research

According to Michael C. Kemp (2003) after increasing different natures of security threats during ongoing event the quest for security screening has been increased. Many techniques have been adopted to cope up this issue the electromagnetic spectrum from X-rays and Gamma rays have been used. Terahertz technology for detection is going to be used, which is in between microwave and infrared respectively. The Terahertz imaging technology emits non-ionizing radiation to detect the hidden objects even from deep clothing, packaging or envelopes respectively. Moreover, it has a propensity to smell the plastic
explosives, chemical and biological agents. So Terahertz technology is one of the best modern security detection tools for screening and counterterrorism on the check posts.

As per Hakan et al (2003) the characteristics of nanoscale composites by terahertz spectroscopy are dealing with tangible pump-THz having experiments on single side of carbon wall nanotubes (SWCNTs) on quartz particles. The outcomes opined a higher side of carrier-lifetime that is on the order of 1.5ps to the extent of THz pulse duration. So the experiments have been repeated for ion-implanted, 3-4nm Si nanoclusters in quartz for which lifetime of carrier need to be assessed at 1.5ps. THz time-domain spectroscopy (THz-TDS) of SWCNTs depicted that THz pulse top transmission changed under optical enlightenment.

Felipe Oliveira et al (2003) discussed the neural network analysis of terahertz spectra of explosives and bio-agents. The real purpose of this networking technique and device is to detect the hidden biological and explosive elements in real time and wide field of view having electro-magnetic range from 0.1 to 3 THz. This is neural networking of terahertz spectra and associated images will furnish the specificity of agent detection and reduction of frequency of incorrect alarms. The adequate training of the security agents is the key to the success of efficient operations of this device. The threats and fears in this research are the identification of the multi-layered perception, number of hidden nodes, training algorithm vis-a-vis back propagation and determination of what type of THz spectral image containing both spectral and spatial information need to be analyzed with the assistance of Neurosolutions (TM) commercial neural networking software package.

In the view of Bradley S. Ferguson et al (2003) dealt with T-rays imaging. Pulsed THz imaging system has lot of valuable merits in inspection application. These are based on infrared frequency range. Herein we use T-ray imaging to identify different powdered materials hide inside envelopes. The terahertz spectral information helps in identification through the thickness of different range of powders.

As per R. Lawrence Ives et al. (April 21, 2003) there is a need for the development of backward-wave oscillators for terahertz application. In this research paper, Calabazas Creek Research Inc. was funded by the National Aeronautics and Space Administration to develop advanced backward wave oscillators for incorporating energy recovery, air cooling and improved performance.

Peter M. Livingston et al. (2003) extended their research on Compact Phonon Pumped Terahertz Laser This paper elaborates the concept to develop coherent THz radiation in a semiconductor diode device by using phonon generation via high-mobility electrons in semiconductor quantum well heterostructures. The theoretical basis for injecting both acoustic and optical phonons by high-mobility, bi-dimensionally confined electrons has been established over the yester decade. The electrons move parallel to the quantum well hetero junction, as their movement velocity exceeds either the local velocity of sound or the phase velocity of optical phonons in the crystal, energy is transferred from the electrons to the phonons (Cherenkov radiation). Strong concealment of both electrons and optical phonons in the quantum well leads to highly efficient energy transfer from high mobility electrons to coherent phonon waves. Harmonic motion of Plasma created by coherent phonons in a polar material (such as GaAs or InP) create breeding stock THz electromagnetic fields. This process is correlative to the physical process that is the basis of a laser vis-a-vis multi-level pumping, stimulated emission, and a selection of one mode at the expense of the other modes. This research elaborates a design approach to set up structures that will produce required electron velocities and bias fields, for phonon emission through electrical injection. This
research paper will also discuss the applicability of incorporating acoustic mirrors for a high finesse phonon cavity, and approaches for out coupling the THz radiation.

As defined by Tim D. Drysdale et al (April 2003) the tunable photonic crystal filter for terahertz frequency application. In this research paper, it has been investigated that the tunable metallic photonic crystal filter with an original mechanical tuning method, fit for use in terahertz frequency applications. Tuning demonstrates in a micrometer-driven prototype at rigorous full-vector electromagnetic simulations. The filter has the extraordinary benefit of robust and compact construction and tunable operation that readily scales to any desired terahertz frequency.

**Theoretical Construct/Research Gaps**

The dominant literature discussed above has few gaps with reference to security as well as traffic management from terrorists’ attacks. So to reduce the terrorists’ activities, it is necessary to increase the use of modern technology especially on security check posts within and outside the cities especially at entrance or exit points respectively. This research paper deals with the awareness of general public through Print, Electronics as well as Social Media about the use of E-Tag for the reduction of specious and terrorists’ activities.

**Theoretical Model showing relationships of Variables**
This is the theoretical model showing the research gap, wherein different variables mentioned above has shown relationship with modern technology likewise E-Tag. These variables have been developed during semi-structured interview protocol with the respondents based on the personal observation of researcher as well.

**Subject of Case Study**

The subject of Case Study deals with two major branches of Social Sciences vis-à-vis Management as well as Marketing respectively. The role of Management is to control, lead and organize the Security and Traffic issues and Marketing is engaged with advertisement, publicity and media campaign regarding awareness of general public about the frequent use of E-Tag for their personal as well as vehicles identification.

**Summary**

In this chapter the theoretical framework as well as the contribution of previous researchers in shape of literature, types, assumptions and characterizes of both qualitative as well quantitative researchers have been discussed.

**Research Methodology:**

**Objective of the study**

The study was conducted to achieve the following objectives:

1. To investigate the problems regarding traffic jam on security check posts.
2. To know the usage of technology especially E-Tag facility for smoothening the traffic flow and reduction of terrorist activities.
3. To identify the barriers for not proper implementation of E-Tag facility on security check posts for the rapid identification of person as well as vehicle.

**Research Question**

1. What are the problems regarding traffic jam on security check post?
2. How satisfied the usage of technology especially E-Tag facility for smooth flow of traffic and reduction of terrorist activities?
3. What are the barriers for non proper implementation of E-Tag facility on security check posts for the rapid identification of person as well vehicle?

**Population**

This research has been conducted in the Cantonment Area of Lahore, and all the driving license holders of this area are considered as the focus population.

**Sample**

In research terms, a sample is a group of people, objects, or items that are taken from a larger population for measurement (Cochran, 1963).
Sampling

Sampling is the act, process or technique of selecting a suitable sample, or a representative part of population for the purpose of determining parameters or characteristics of the whole population (Cochran, 1963).

Data Sources

Qualitative research data collection methods are time consuming; therefore data is usually collected from a smaller sample than would be the case for quantitative approaches, therefore this makes qualitative research more expensive (Mack, et. al., 2005). Following are the main methods of data collection in qualitative research:

- Focus group
- Interviews
- Participants observations
- Document analysis (as a source data)

In this research the data has been gathered through personal interviews from twelve participants by their free will from different profession and academic back grounds.

Ethical Considerations

Ethical consideration is every qualitative research is the free will of participants at the time of interviews or observations so all the parameters of ethical considerations have been adopted while collecting the interviews from the twelve participants.

Research Design

This paper is based on qualitative research and the data has been gathered from twelve persons from different profession and educational status by their free wills. The instrument of research was face-to-face as well semi-structured telephonic interviews on open ended questions. Software used for coding and interpretation of qualitative data was NVIVO.

Interview Instrument and Protocol

- May I know your good name and profession please?
- Would you please share your driving skills and the vehicle use for this purpose?
- Would you please share your opinion about Terrorist Activities in Pakistan?
- So the measures adopted by Securities Agencies to minimize Terrorist Activities on Check Posts are sufficient as per your views?
- May you express your feelings about Traffic situation within and outside cities of Pakistan?
- If you are facing some Emergency, but the Security Official stops you on Check Post or Toll Plaza for verification of yours as well as vehicle’s identity then how do you react?
Would you please suggest what should the Security Agencies do to scrutinize the terrorists on pickets without interrupting the traffic? Would you please share your experience about verification of person as well as vehicle’s identity through E-Tagging Device?

Would you please share the Public perception for not adapting this facility? Should government make some heavy advertisement through print & electronic Medias for Public awareness or it may be deemed mandatory in by-laws?

Are people frightened from Annual Subscription as well as lengthy procedure for getting E-Tagging enrolment from Security Agencies? Please share your response, if this facility is available on the check post?

Besides good features of E-Tagging Security measures would you please share any lacuna in this system, if some thief or terrorist drives the vehicle having E-Tagging Sticker on it?

Demographic Profiles of the Driving License Holders representing the Population of Lahore Cantonment

According to a careful Population Survey of Lahore District as on Calendar Year 2013 the Total Population of Lahore is 12,218,345 out of which 81.17% pertains to Urban Area and remaining 18.83% belongs to Rural or Sub-urban Areas respectively. The Prime focus of this Research is the Awareness of General Public living and working in Lahore Cantonment Area about the use of E-Tag facility on Security Pickets to save the time reduction of Terroristic Activities. From the above demographic profiles, it is very clearly depicted that the 12 people have been selected from not only of different Professions but also from different Qualification and status. The one thing is common among them is that all have own Driving Skills.

Data Analysis Strategy

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Name</th>
<th>Qualification</th>
<th>Profession</th>
<th>Driving Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Mr. A</td>
<td>Computer Engineer</td>
<td>HR Manager</td>
<td>Sensible Driver</td>
</tr>
<tr>
<td>2</td>
<td>Mr. B</td>
<td>M.Phil</td>
<td>Mkt. Mgr.</td>
<td>Ability to drive 4-5 hrs continuously</td>
</tr>
<tr>
<td>3</td>
<td>Mr. C</td>
<td>PhD</td>
<td>Scholar</td>
<td>People say that I am a rash &amp; vagabond</td>
</tr>
<tr>
<td>4</td>
<td>Mr. D</td>
<td>BCs</td>
<td>IT-Professional</td>
<td>No special skills in driving</td>
</tr>
<tr>
<td>5</td>
<td>Mrs. E</td>
<td>Doctor</td>
<td>Doctor</td>
<td>Can drive car</td>
</tr>
<tr>
<td>6</td>
<td>Mr. F</td>
<td>MBA</td>
<td>Pvt. Biz.</td>
<td>Confident Driver</td>
</tr>
<tr>
<td>7</td>
<td>Mr. G</td>
<td>B.Com</td>
<td>Banker</td>
<td>Reasonable Driving skills</td>
</tr>
</tbody>
</table>
This is the pure qualitative research, wherein the whole data has collected from face to face interviews and using qualitative software NVIVO for transcribing, segmenting, coding, categorizing, creation of nodes and thematic and content analysis respectively. Appended below are the operational definitions of these technical terminologies:

- Transcribing means to put the data into more analyzable form
- Segmenting means to divide that data in meaningful ways
- Coding defines to identify themes and concepts in the data
- Categorizing refers to the group codes
- Relating Categories means to figure out relationships between categories
- Prioritizing defines to create a hierarchical category system
- Enumerating means to quantify the data to look for the frequency
- Memoing describes to write reflective notes about the data and determine what to do next
- Diagramming means to understand complex relationships

Therefore all the parameters of good Data Analysis Strategy have been adapted from data collection to its analysis and interpretation respectively.
# Thematic Table on Public Awareness about E-Tag Device on Security Check Posts for smooth Traffic Management & Reduction in Terrorists Activities

<table>
<thead>
<tr>
<th>Research Question</th>
<th>Themes</th>
<th>Category</th>
<th>Sub-Category</th>
<th>Theoretical Lens</th>
<th>Substantial Contribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>What are the problems regarding traffic jam on security check post?</td>
<td></td>
<td>Public Awareness about E-Tagging through Media Campaign</td>
<td>Public Perception about E-Tagging Facility</td>
<td>By adopting Modern Technology like E-Tag on Security Check Posts and on Toll-Plazas not only the traffic flow is efficiently managed but also helpful in reduction of Terrorist Activities by Proper Identification of Person as well as Vehicle.</td>
<td></td>
</tr>
<tr>
<td>How satisfied the usage of technology especially E-Tag facility for smooth flow of traffic and reduction of terrorist activities?</td>
<td>Smooth Traffic Management &amp; Reduction in Terrorists Activities</td>
<td>Public perception about Annual Subscription &amp; Lengthy Procedure</td>
<td>Suggestions for Security Measures on Check Posts</td>
<td>Hierarchy-of-effects models (Robert J. Lavidge, Gary A. Steiner, 1961)</td>
<td></td>
</tr>
<tr>
<td>What are the barriers for non proper implementation of E-Tag facility on security check posts for the rapid identification of person as well vehicle?</td>
<td></td>
<td>Verification through E-Tagging Device</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

In the above thematic table the research questions of this qualitative research have been discussed on the theme of this topic regarding smooth traffic management and reduction of terrorists’ activities by the use of modern devices and technology on the security check posts. Hierarchy of effect Models has been applied as a theoretical lens and the significant contribution of this study is that within the vicinity of Pakistan, it has not yet seen earlier.

**Summary**

This chapter comprise of the methodology used for conducting this research Similarly the method for collection and analysis of data through interviews from general public and onward interpreting the results by using the qualitative software vis-à-vis NVIVO.
Research Model

This is very comprehensive model of whole research conducted on real time basis during face to face interviews of twelve participants. This research paper has three dimensions related to the role of security agencies, use of modern technology and awareness of general public respectively. The results of this model have been generated by using the Qualitative Software NVIVO.
Data Analysis Strategy and Coding-(Matrix Framework Model)

The matrix framework Analysis has been developed by making nodes and sub-nodes on the qualitative software NVIVO. It shows the importance of different variables in shapes of themes. More the use of E-Tag by the general public reduces the burden on security check posts, which is helpful in managing frequent traffic flow accordingly. The identification of person as well as vehicles passing through the check posts is used to be made by the modern machines in an efficient manner, which a man or a dog can’t do it.
Word Frequency Count

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<th>Count</th>
<th>Weighted Percentage (%)</th>
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The word frequency table is generated by Qualitative Software NVIVO. It shows the importance of different words in this research paper. The frequency counts of words “E-Tag”, “Security”, “Check-posts”, “traffic”, “terrorism”, and “Awareness” respectively are showing handsome counts. So this may be assumed as “Content Analysis” of this research paper by the use of qualitative software NVIVO likewise Thematic Analysis.

Summary

In this section the model variables, framework matrix and word frequency tables have been discussed in details showing their importance in diagrammatic form for better understanding of the whole research conducted so far.
Discussion:

Thematic Analysis
Impact of Terrorist Activities in Pakistan

Pakistan is the country the borders of which touches with five countries like India, China, Iran, Afghanistan and Russia respectively. Pakistan fought three wars with India due to the issue of Kashmir and engaged with Afghan war with Russia as well. And Pakistan is the one, which has not accepted the solidarity of Israel, so that both these countries don’t have foreign relations. Similarly Pakistan is the first Muslim country and the seventh country in the world, which has attained the Nuclear Power. So due to all these issues some external as well as internal notorious powers don’t want peace in Pakistan. And used to detract Pakistan socially, economically, politically and morally through different types of Terrorist Activities occurred on the basis of sectarianism, religionist, regionalism, gender, class, culture and language respectively.

Measures adopted by Securities Agencies

Due to the non proper coordination amongst all the security agencies of Pakistan the terrorists used to take benefits always. Security Agencies used to become active after any counter attack by terrorists. They have made big blasts even at the Head Quarters of Army, Navy, Air force, Police and intelligence agencies as well. Similarly no market, no park, no mosque, no bazaar and no religion procession are saved from their attack. One of the root-cause for this security laps is almost no use of modern technology. There is no concept of checking the identity of person and vehicle while passing through the security check posts. And due to manual checking of identity on security check posts the long queues used to established, which cause road block and traffic jam respectively. So the extensive use of modern technology is the need of the day to cater this issue.

Traffic situation within and outside cities of Pakistan

Besides Motorway there is no concept of good traffic management within and outside cities of Pakistan. The problem of this situation is twofold vis-à-vis no meritocracy and extensive corruption. Neither the officials of Traffic Authorities are loyal nor that of General Public. References and kick-backs are used in issuances of Driving Licenses, so due to this problem a person can get driving license without having driving sense. In the developed nations there is no concept of Traffic Warden on the Traffic Signals, but in Pakistan if Traffic Warden is no there then people damn care about the Signals whether it is Red or Green they passed out accordingly.

Identification in case of Emergency

This is one of the serious issues highlighted by the respondents in this research that in case of emergency there is provision to pass out from the security check post or even a toll plaza when there is a long queue in front of your vehicle. The manual checking of each vehicle takes 2 to 5 minutes or sometimes more on security check post, whereas it only takes few seconds when someone has a facility of E-Tag on vehicle.
Scrutiny through E-Tagging Device

This is one of the safest and compact modes of checking the person’s as well as vehicle’s identity while passing through the security check post through E-Tag device. It only takes few seconds for checking the right person and right vehicle while passing through the security check post. More use of technology is required to cater the problem of traffic as well as terrorism in the country.

Public perception for not adapting E-Tag facility

With careful estimation it is observed that the ratio of E-Tag users and Non E-Tag users is 2:98 respectively. In general there is no campaign by the authority to educate General Public on the use and benefits of E-Tag facility for checking their identification on security check posts to minimize the burden of traffic and checking of persons as well as vehicles identities while passing through the security check posts. So the general public needs to be educated through print, electronic and social Medias by heavy campaigns, advertisements and publicity respectively.

Fear from Annual Subscription and lengthy procedure

Twelve face to face interviews have been conducted from well educated class of people in conducting this research. And more or less everyone is of the opinion that there are two issues in non-adaptability of E-Tag facility by the general public vis-à-vis the lengthy procedure as well as handsome amount of annual subscription for renewal of this facility. If this facility is available alongside the Security Check Post with different subscription packages then the trend will altogether changes.

Lacunas in E-Tag System

In the initial stages of E-tagging system, it will be a quite good initiative to increase the numbers by motivation. But in the long run in order to adopting more foolproof security measures it should be amended with proper scanning of vehicle as well as the eye-retina scanning of person on driving seat otherwise any thief or terrorist can use the snatched vehicle of real owner for crime and terrorist activities respectively.

Summary

In this section all the themes, which are considered as the variables of this research have been discussed in details and high lightened the intensity on each themes on the basis of public opinion during interviews and personal observations of the researcher as well.

Conclusions & Recommendations:

Research Questions

What are the problems regarding traffic jam on security check post? How satisfied the usage of technology especially E-Tag facility for smooth flow of traffic and reduction of terrorist activities? What are the barriers for non proper implementation of E-Tag facility on security check posts for the rapid identification of person as well vehicle?

In the light of above research, it has been concluded that the authorities should advertised the use of E-Tag facility through print, electronic as well as social media in order to educate general public about
the facilities of modern technology. There need a proper installation of walk through gates, security cameras, sensors as well as scanners to identify the vehicle as well as person identity. Similarly the application procedure should be available on the spot, so that more and more people will get this facility in order to save time to avoid long queues on the security check posts for smooth flow of traffic and reduction of terrorists’ activities in the presence of instant identity of person as well as vehicle.

Recommendations and Implication for Theory, Research and Practice

This is a good contribution towards theory, research and practice as Pakistan is always at the stake of terrorism due to different types of religious and sectarian groups. There is uncertainty and risk of life everywhere whenever someone goes outside home as neither any public place nor any high profiled building is free from terrorist attack. Therefore extensive use of modern technology can minimize the fears of terrorists’ attacks. In the first phase, it may please be recommended to aware general public about the use of E-Tag, so that large number of people as well as vehicles can be entered into database for identification. This is good addition in theory as in this paper the rules of management and marketing have been applied on the control of traffic and terrorism in the presence of modern technology. And if government and other security agencies adopt this practice then they can easily control the traffic flow on security check posts, but also reduce the terrorist activities by the exact identification of person as well as vehicle.

Summary

In this section the interviews of twelve participants have been discussed in details. The research questions as well as the contribution to theory have been discussed. Similarly the recommendations to the authorities for its proper implementation have been addressed as well for management, control and organization of traffic and reduction of terrorism by the use of modern technology.

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Appendices:  
Results and Diagrams Drive from NVIVO:

### Traffic vs Terrorism Management

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### Sources clustered by word similarity

- Mr. Kamr...
- Mr. Adil H...
- Salman B...
- Mr. Riaz...
- Mrs. Qais...
- Mr. Asad...
- Mr. Furqa...
- Mr. Mobi...
- Mr. Zain...
- Mr. Ather...
- Mr. Adna...
Abstract

Islamic banks and Islamic financial institutes was established to develop the Islamic economic, where one of its main tools from the financial and monetary perspective, but under a provisional system to ensure the legitimacy and correct path as well as the right goals and tools. According to that, a Legitimate (Sharia) Council do these active functions to achieve the obligation of bank and the establishment in the provisions and legal principles. The legitimate Oversight Council protects the banking functions through its system which includes Sharia rules that regulate the various banking activities with accordance of Islamic law and prohibiting banking activities which found opposing the provision of Sharia and Islamic law. It is recommended that to ensure full compliance with the provision of Islamic law and Sharia in financial activities, the Legitimate Oversight Council should exist in any Islamic bank to ensure the compliance of Islamic banking products and activities, and provide full integrity of financial transactions in terms of their Islamic character.

Keywords: Oversight Council, Sharia Council in Islamic Banks

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Published on: 21-08-2016
The concept of Oversight Council

The concept of oversight in banks as a term used to describe the means by which to ascertain the extent to which the objectives adequacy and its effectiveness in the specified time (Ibn Mandhur 424/1, Al-Razi 106).

The concept of oversight in banks in its second term is “the evaluation if everything follows a predefined plan and issued instructions with accordance to agreed principles (Al-Shobaki, 1989).

The meaning of legitimate (Sharia) oversight in general is to follow-up, audit, examination and analysis of all works and behaviors and others banking and financial activities to ensure they are in accordance with the provisions and principles of Islamic law as well as matching the behavior of the bank with scholars’ views (fatwas), decisions, and recommendations issued by the Fiqh groups and similar Councils, where using a range of appropriate means and methods that are conformity to Islam and its law, and finding irregularities, errors and correct them as well as reporting these errors to the authorities concerned, which including the notes, guidelines, instructions, and describing how to achieve better development. In recent times, and after establishing the Islamic financial institutions, people thought that the Sharia Council is associated with Islamic financial institutions alone only, but the Sharia Council should be applied on individuals, governments, acts, and all transactions, and there are specific characteristics of Sharia oversight as follow (Shehata, no date):

1. The operations of Sharia Council include the following-up all actions and behaviors of individuals, groups, institutions and others, then evaluating them and review them in the light of the provisions and principles of the Islamic Sharia. In addition to that, include the analysis of errors, irregularities, and deficiencies, if any. Moreover, illustrating the reasons for errors, shortcomings and setting the necessary recommendations to resolve them.

2. Applying Legitimate (Sharia) Council is obligatory, and applying it is not limited to a particular area or on particular people, but it should be applied on individuals, businesses, institutions, government agencies, and other bodies (Muhammad, 2012)

3. The principles and standards of Legitimate (Sharia) Council are derived from the combination of provisions and principles of the Qur'an and Sunnah as well as Islamic sources such as scholars’ writings and books in this subject, as well as fatwas issued from the Council of Fiqh (jurisprudence) and Fatwa legitimacy in everything novelty and contemporary.

4. There is a legitimate observer and investigator who use legal methods and means to accomplish his/her work, and then selecting them depending on the circumstances and the nature of the monitored matter.
5. The Sharia (legitimate) oversight is founded to guide people toward the law of Almighty Allah and establish commitment with Almighty Allah to help people evaluate and correct their mistakes and irregularities if happened.

6. There are a team of scholars, scientists and experts, who take over the work of the Sharia and who enjoy their independence and neutrality, but the recommendations of the Commission are binding and enforceable and they are not considered a consultant (Bahgat, 1994).

The concept of legitimate oversights in Islamic banks

The legitimate oversight represents the inspection of commitment by the Islamic Bank on the provision of Islam and the whole activities of the bank. The inspection includes the following activities: Contracts, agreements, policies, banking products, transactions, contracts for incorporation, financial statements and reports in particular internal audit and inspection reports by the Central Bank. The inspectors have the right to read all records and transactions (see the committee of professors and economists and banker’s immigrants, 1996, and the Accounting and Auditing Organization for Islamic Financial Institution, 2004).

Establishing a Legitimate (Sharia) Council and its functions

1. The formation of Sharia Council in Islamic banks represent a Legitimate Oversight Council which is unable to fulfill its functions and achieve its role correctly unless includes three complementary departments (boards) as follow:

2. The board of fatwa: the board is responsible for issuing fatwas and rooting of Sharia forensic for developing the mechanisms of Islamic banking, the board of Fatwa is present at all level of each bank, and contribute to the creation of legitimate alternatives and practical solutions to the problems of Islamic banks as well as dealing with the theoretical aspect of Islamic banking (Al-Qattan, Secretary, second).

3. The board of Sharia inspection: this board is present at all departments of Islamic bank and its mission to monitor the implementation of advisory opinions and recommendations of Fatwa Council and ensure that the Islamic bank management is committed to the directives of the Fatwa Council and the advisory opinion of them, and the legitimate limitation drawn to them (Abdul Karim, 2009).

4. The Supreme Oversight Board : This board is at all level of banks, which constitute the reference for all legitimate oversight bodies in Islamic banks, and this board review the legitimate foundations of Islamic financial products, and it is responsible to grant the integrity of Sharia application and the approval of the principles and provisions of Islamic product, decline contracts, approve documents, and monitor mechanisms and purposes of Islamic financial products before processing of classifying them technically and legally according to Sharia (Abdul Karim.2009).
The main functions of Oversight Council (al-Aliat, 2006):

1. To ensure the matching of Islamic banking activities with the provisions and principles of Islamic law, and review Fatwa position before and decision, and may request all associated data that support achieving its mission.

2. To refer the banking, financial and administrative transactions developed for Fatwa board and issue necessary fatwas.

3. Replying all question received by the Sharia Supervisory Board, and read the request of Muslims to determine the legitimacy of the transactions with accordance of Islamic law.

4. Prepare periodic reports during the year, and present them to the Board of Fatwa included the extent of financial transactions which are comply with the provisions and principles of Islamic law.

5. Prepare an annual report and submit it to the General Assembly in a form of a certificate stating the extent of compliance with the provisions and principles of Islamic law to all financial transactions carried out by the Islamic bank.

6. The Council is cooperating with the various regulatory agencies in the interests of the Islamic banks.

7. Stating the new fatwas within the economic and banking sector, which are issued by the jurisprudence bodies, and evaluate the necessary fatwas in the Islamic countries as well as examining its importance.

8. Finding Islamic alternative transactions which found violating the provisions and principles of the Islamic Sharia.

9. Following the developments in the Islamic banking sector to offer new versions of Islamic transactions (Mashal, 2004).

It is not a compulsory that the members of fatwa Council should be available the whole day, but they could be available according to periodic meeting after agreeing and planning by all members, or can gather immediately after a call from the sole legal observer in the Islamic bank if it is necessary, and each member has the right to get all data and necessary information to fulfill the work as well as reading the panels, systems, instructions, records, contracts, and agreement, where the decision of the Council is obligatory to the banks within its area of work.
The role of legal observer in Islamic banks

The legal observer is a representative of legal oversight board in Islamic banks, and the most important roles are the following:

1. Following up all transactions in Islamic bank, and make sure these transactions are carried out in accordance with the provisions and principles of Islamic law, and indicating any irregularities and mistakes in order to inform the general manager of the bank to correct them in time.

2. Processing and collecting the issues that need for interpretation and submitting them to the board of fatwa and Sharia Council in its regular meetings to take the right decisions about them such as issuing new fatwas or raising them to other bodies or scholars or scientific centers specialist in legitimate fatwa (Lal Din, 2009).

3. Inviting the Sharia Council Board to held immediate meeting if it is necessary.

4. Respond to questions sent to him and answering them according to his knowledge, otherwise raise them to the Sharia Council Board if it is not possible to answer them individually.

5. To perform his functions, the observer compiles the necessary data and information and then conducts interviews with the executive department in the Islamic bank.

6. Attending meetings of some important committees in the Islamic Bank, such as: Investment Committee, and the Committee of Personnel affairs (Mashal, 2004).

7. Supervising the work of his deputies and following-up and evaluation of their performance and work to overcome the difficulties they face during the work.

8. Organizing seminars, lectures and meetings related to the development of employees and developing their knowledge about the legitimacy of fatwa as well as responding to their queries (Bayraktar, 2008).

In addition to that, the legitimate observer has the same rights of the legitimate Oversight Council, for example he is authorized to acquire all data and information which are deemed necessary to perform his work and reading all panels, systems, and instructions.

The Role of legitimate observers in Islamic banks

The number of legitimate observer is different depending on the size of the Islamic bank and the types of its activity, where they should have adequate knowledge about the nature of Islamic banking and its main functions, also full understanding of the jurisprudence of transactions according to Islamic law and the principles of Fatwas and legitimate banking and finance according to Sharia of Islam and adopt them in new transactions. Furthermore, the legitimate observer should follow other legitimate group, and take their
way and planning of work and how they conduct legal oversight in Islamic banks in weekly and daily basis. The most important tasks that can be performed by the legitimate observer are the following (Raihan, 2007):

1. Verifying documents, records, books, contracts and files, conventions and fatwas issued and banking transactions and ensure they are compliance with the provisions and principles of Islamic law after careful examination and review to them (Hiam ,2013).

2. Inform the executors through legitimate observer of the bank about any mistakes and or irregularities in the implementation of Sharia in Islamic banking as well as fulfilling the provisions and principles of Islamic law in financial activities.

3. Submitting recommendations, guidance, and advice as necessary to straighten the implementation of Islamic banking and avoid irregularities and mistakes in the future.

4. Grouping transactions that need for fatwa and forward them to the Legitimate Oversight Council of the bank in order to verify the compliance with rules of Sharia and the regulations of legitimate Oversight Council.

5. They have the right to attend some meetings related to issuing fatwas and legitimate oversight such as the meetings of internal financial oversight department. Help legitimate observer if necessary to do his job.

6. Evaluate the legitimate performance in the bank with accordance to Sharia and Islamic provisions before submitting a report to the legitimate Oversight Council as well as prepare periodic reports of legitimate observer about the result of legitimate evaluation.

7. Monitor the implementation of the decisions and recommendations of the Legitimate Oversight Council and the legitimate observer.

8. Act as a legitimate representative in meetings with committees from Islamic banks to make sure that the decisions taken were in conformity with the provision of Islam (Mushaghil, 2004).

9. Any other work assigned to them within the scope of Sharia and Islamic banking.

The characteristics of the members of Legitimate Oversight Council

The members of Legitimate Oversight Council should have special characteristics which distinct them from other members, such as the characteristic of mufti and diligent where they are able to judge in banking and financial issues which are referred to them in order to issue a decision about it (the Committee of Economic Experts and Legislators of Banks, 1996).
Personal Characteristics, academic qualifications

Personal Oversights: The qualities that must be met by members of the Council are numerous such as neutrality and integrity and avoiding bias in decision making, and to be experiences in Arabic language and staying away from extremism in religion, and they should have a good knowledge in science, Quran, Sunnah, the origins of jurisprudence in Islam, and the evidence of population, consensus, and the speech of scholars in religion as well as the purposes of Sharia (the Committee of Economic Experts and Legislators of Banks, 1996).

Occupational Oversights: the good knowledge of the member in the details of his work in Islamic banks and the reality of Islamic banking, also the details of transactions in Islamic banking according to Sharia and the provisions of Islam (Kahtan, 2008). Therefore, it is important to have a team in the Council that combines both specialists in financial transactions and experts in banking aspects to achieve the Islamization of banking transactions obtained by Islamic banks, and the Council is characterized by the following:

1. Staying away from suspicion of personal interest and avoid involving the members of Legitimate Oversight Council in the Bank's Board, and the members of the Council contributes in the bank's capital and are chosen by the General Assembly of the Bank.

2. The specialty of the Council is limited in preparing reports and everything related to the contracts and reviewing them as well as submitting fatwas and following up the execution of them and consultation. Moreover, they are responsible on answering any question related to jurisprudential matters, the authority to stop illegal transaction inside the bank and managing the affairs of Zakat inside the banks. There are many other works could be achieved by those members, where the Council exercise its oversight mission through a representative inside the bank who is entitled to attend the periodic meetings.

The conditions that should be provided in legitimate observer in Islamic banks

Academic and practical qualification:

Scientific qualification: The observer should be qualified scientifically and have some publications in legitimate, financial, and commercial aspects (Laldeen, 2009) as in the following:

- He should be well familiar and understandable in legal aspects associated with Islamic law and Fatwas.
- Should understand the various transactions in Islamic banking.
**Practical Qualifications:** The observer should have adequate experience in his work not less than 10 years in Islamic banks and his work should be in the field of legitimate oversight as well as similar activities in order to be familiar with various banking aspects and how to apply legitimate Fatwas in Islamic banks (Shahata, 2002).

**The conditions that should be available in legitimate auditor in Islamic banks**

Legitimate auditors represent the executive tools for the legitimate oversight in any Islamic bank. Therefore, it is important to select them and prepare them as well as develop their skills and knowledge by training, where the personal characteristic and scientific and practical qualification of the legitimate observer from others only be the level of knowledge and experience which might be relative as follow (Alber qadar, 2008):

**Scientific qualification:**

- The legitimate auditor's qualification should be at least at the university level in the field of Islamic law and trade.
- Understanding and conversant of legitimate fatwas in banking and financial transactions.
- Knowing the functions of Islamic bank, and have a good knowledge in scientific issues and legitimate oversight in commercial and financial aspects.

**Practical qualification:**

- The legitimate auditor should be well trained in in the field of Islamic transactions and finance.
- The experience of legitimate auditor should not be less than three years in the field of Islamic banking and related activities.

**The independence of legitimate Oversight Council and the extent of its obligations**

**Independence and Objectivity**

The independence of the Legitimate Oversight Council in Islamic banks is necessary, Banks need a oversight system which is supervised the financial activities inside the bank and enjoy objectivity and independence, and ensure that the bank's operations conform to the provisions of Islamic law and achieving the purposes of Sharia, and if there is any doubt in the independence and objectivity of the Council the confidence of depositors and bank’s customers will be affected, also the absence independent Council would raise doubts to clients about the level of genuine Islamic banking as well as raising uncertainty among them which me may lead to stop dealing with the bank (Abomouamer, 1989).

The Islamization of conventional banks may raise suspicious about the objectivity and independence of the Council which should be well clarified, and it is a condition that the legitimate oversight is not biased.
and neutral and staying away from any external or internal pressure on its work. The independence of Legitimate Oversight Council

Should be perfect in order to fulfill its duties and all members should be independent as well. Shekh Qurah Dagh refers to independence of a member in the Council is “not subject either by saying or work to internal effect or personal purpose or managerial pressure” (Qurah Dagh, 2011). The evidence for that from the verses of Quran: (O ye who believe! stand out firmly for Allah, as witnesses to fair dealing, and let not the hatred of others to you make you swerve to wrong and depart from justice. Be just: that is next to piety: and fear Allah. For Allah is well-acquainted with all that ye do) (Surat Al-Maaida, Verse 8).

The independence of Legitimate Oversight Bod (Al-Shaikh, 2006)

This is divided to the following:

**Intellectual independence:** The Council is intellectually independence which enable it to issue decisions with objectively and freedom, and the Council can carry out comprehensive oversight of its organization and access important information and understanding Islamic banking products and its purpose, where its benefit has an impact on the society and achieve the legitimate goals. The Council can participate in the work of the bank from the first inception or to create Islamic products to the day of release following the financial institution's support, and the balance of the organization in achieving its goals, and produces understanding between the institution and the Council, and performing the duties of the Council with clear mind, and to meet the needs of the community without the pursuit of profit, and to improve the relationship and increase cooperation between organization and management of the bank, and Council is an important factor and not a hindrance to the progress of the bank.

**The organizational independence:** The organizational independence of the Council is associated with its position in the organizational structure of the bank, where its position should belong to the general assembly, and the assembly should have an authority for employment and termination of jobs, whereas the management has no power. To ensure the independence of the Council in Islamic banks there should be special regulations that organizes the work of the Council and specify its mission and objectives as well as the relationship between the internal legitimate Council, the general assembly, the board of the bank, the employees, and the clients of the bank (Albekadar, 2008).

**The importance and goals of the legitimate oversight in Islamic Banks (Kuwaiti finance, 1985)**

The Legitimate Oversight Council is responsible for issuing Fatwas, and during the annual report before the management and stakeholders, the Council inform them about the judgment of Almighty Allah, in particular accountability (Husbah), testimony, documentation and arbitration. The goal of the Council is to ensure that the activities of the Islamic bank are not a contrary to the Islamic law, then it requires to ensure all decisions and recommendations by the Council are binding, which are represent the following:
The main goals of Legitimate Oversight Council

1. A statement for dissolution or prohibiting Islamic banking transactions carried out by for the application of Halal transactions and avoid the prohibited, and encourage the dealers with Islamic banks to comply with the provisions and principles of Islamic law in order to distribute the benefit for society (Kuwait Finance House, 1985).

2. To ensure full confidence that the systems and internal regulations of Islamic banks has been prepared in accordance with the provisions and principles of Islamic law and holding accountable those who deliberately breach these regulations (Hassan 2002).

3. To ensure that the selection of professionals and employees in Islamic banks have been achieved according to Islamic standards and these standards concerning personal characteristics and scientific qualifications for them (Shehata, 2002).

4. Ensure that the systems and models, records, and other cards have been designed in accordance with the provisions and principles of Islamic law (Sharia) and any violation are being modified (David, 1996).

5. Continuous to follow-up, audit and analysis in Islamic banks to ensure that implementation of Islamic regulations are in accordance with the provisions and principles of the Islamic law (Sharia) and the defining the problems and difficulties as well as the tools to overcome them.

The importance of Legitimate Oversight Council

The Legitimate Oversight Council is considered one of the bases of the Islamic banking system, and one of the elements of discrimination from the conventional banking system, and that is clear in the standards issued by the Accounting and Auditing Organization for Islamic Financial Institutions, and each Islamic institute should have a Legitimate Oversight Council (Accounting and Auditing Organization for Islamic Financial Institutions, 2004). When and a conventional bank is changed to an Islamic bank there must be Legitimate Oversight Council inside the bank after the change as well as Internal Oversight Council, where some countries like Malaysia made is a special law for any conventional bank aims to change for Islamic banking (the Malaysian Code, 1983).

The Legitimate Oversight Council grant confidence for the bank and provide legal framework to Islamic banking activities, also encourage people to deal with the bank because the existence of the Council is necessary to issue Fatwas on important matters and transactions which require knowing the legal (Sharia) position with regard to them where the majority of dealers with the bank have no idea about the provision of Islamic law in financial activities, also the specialist in Islamic law and Sharia could have more time to invent and develop Islamic banking products which is compatible with the requirement of the market and Sharia at the same time. Therefore, the presence of Legitimate Oversight Council ensures the finding of financial and investment units that support individuals and community in applying Islamic law and Sharia, and verify that all banking activities are compatible with Sharia. The stakeholders include the legitimate board, shareholders, the management, the personnel, and bank’s clients. According to that, a mutual understanding should be existed between them so that the rights of each party is preserved and grant no party put obstacles against others. However, the terms and condition associated with the performance of
the Council is necessary to be clarified, in particular the independence and neutral performance, which can be achieved through mutual cooperation between all parties (Hamad, 2006).

The Results

The findings from this study showed that Islamic banks become a necessity for work in financial sector in Islamic and Arabic countries. Therefore, it is essential to have an oversight system including a legitimate oversight unit that organizes the work of Legitimate Oversight Council in a way that grant the maximum degree of cooperation between the members of the Council and bank’s management. The Islamic banks practice their work with accordance to the provision of Islam and Sharia, and support the banking functions through special guidelines the follow the Islamic law in order to employ money correctly and should be Halal as instructed by Sharia and the principles of Islam in financial deals, where the legitimate oversight become an essential part of this role. Finally, the result of this study showed the important role of Legitimate Oversight Council in enforcement the legitimate oversight and right opinion in practicing banking activities in Islamic banks, but with a condition that this Council should be independent and neutral as well as it should be formed by specialists and experts in Islamic law and Sharia, also they should be able to invent and develop the work in Islamic banks.

Recommendations

The researcher suggests a set of recommendations based on the findings and result of the study and future work of Islamic banks as follow:

1. There is a need to find new levels in legitimate oversight which include experts and specialist in Islamic banking and Islamic law in the organizational structure of the bank, those experts should well understand the principles of Fiqh, Sharia, audit, and legitimate qualification, where there should be an integrated team to ensure quick response to the challenges facing Islamic banks.

2. To ensure full compliance with the provision of Islamic law in financial activities, the Legitimate Oversight Council should exist in any Islamic bank to ensure the compliance of Islamic banking products and activities, and full integrity of financial transactions in terms of their Islamic character.

3. It is necessary to have a common guideline for Islamic Fatwas associated with Islamic banking, the update of these guidelines is important to follow the latest development in Islamic banking rules.

4. The independence and neutrality of the Legitimate Oversight Council is essential in order to avoid an interfere by other parties on its decision that may affect the performance of the Islamic bank.

5. Selecting qualified members to work in the Legitimate Oversight Council who have long experience in the work of Islamic banks.
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Impact of oil prices on the stock exchange of Pakistan and Malaysia

Abstract
The aim of this study to show the impact of changing oil prices on the stock market of Pakistan and Malaysia. Our study is trying to show that oil prices has devastated impact on all the aspects of the life. We have taken the data of 1989 to 2010. We have applied the correlation and regression analysis. Our study is showing Pakistan is the importing country therefore; it has worst impact on the oil prices of Pakistan. Normally, most of the studies revealed that there is negative association between oil prices and stock market. It is seen that each stock market has the vital role in the progress of the economy. Rising in the prices of fuel can become reason of inflation in the country. By different estimates, emerging countries have also been affected due to increase and decrease the prices of oils.

Keywords: oil prices, Pakistan stock exchange, Malaysia stock market, emerging countries.

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Published: 24-08-2016

Introduction:
The changes in the prices of oil have influenced on the different countries in different ways. On the topic of oil concern, there are some countries, which have crucial role in the exporting the oil like Iran and Saudi Arabia. There are also some major importing country which do import oil from another country, one of them are Pakistan. But in this paper, our concern is with the Asian country. There are a lot of countries which have been affected by the fluctuations in the oil prices. Most of the studies have proved that systematic across countries are most affected rather than some other countries. In this paper, we shall see how all prices impact on the stock markets of developing and under developing countries. Normally, most of the studies revealed that there is negative association between oil prices and stock market. It is seen that each stock market has the vital role in the progress of the economy. Rising in the prices of fuel can become reason of inflation in the country. By different estimates, emerging countries have also been affected due to increase and decrease the prices of oils. In this study, we have discussed the influence of international oil prices on the different stock exchange. As far as, like other countries Pakistan is also known as such country, which economic growth is going fall due to fluctuation in the international oil prices. It is seen that Pakistan is the importing country and more energy intensive. Our rational view is
showing that increases in the prices of oil are the major concerns of inflation. Without the knowledge the oil prices of the country investors cannot predict about the stock market position.

**Figure no 1:**
Followers of the oil market will be familiar with the recent evolution of oil supply and price:
Stock exchange of Pakistan:
In Pakistan, there are three main stock exchange 1) Islamabad 2) karachi3)Lahore stock exchange. Due to political instability the progress of stock exchange of Pakistan is worst.In Asia the return of Karachi stock exchange is more than other stock exchange. Karachi stock exchange is the largest and oldest stock exchange of Asia. In the 2016 from the last few months, its performance was outstanding. Different researchers have explained stock exchange in such words means, a market where securities are traded. Stock market has the vital role in the development of the economy. It is also known as the channel between investors and borrowers. According to Kohl, there is association between stock prices and oil prices. Stock exchange is known as the common feature on the modern economy .without the better performance of the stock exchange, Government cannot start new financing program.

Figure no 2: Fuel consumption by sector

History of stock exchange of Malaysia:
Another name of Bursa Malaysia stock exchange is Kuala Lamoure stock exchange. At the time of 1930, Singapore stockbrokers were first traded their securities in this stock exchange. It was established in 1960.at the time of financial crisis the stock exchange of Malaysia had faced the losses. Due to this reason currency of Malaysia was fallen down.
Oil prices in Malaysia:

Figure no 3:

Problem statement:
Impact of oil prices on the stock exchange of Pakistan and Malaysia.

Objectives:

1) Impact of oil prices on the economic growth of Pakistan
2) Impact of oil prices on the economic growth of Malaysia.
3) Impact of oil prices on the development of both stock markets.

Hypothesis study:
H0: There is positive relationship between oil prices and stock prices
HA: There is no positive association between oil prices and stock market prices.
**Literature review:**

Afia Malik, Found that oil prices have negative association with the stock exchange of Pakistan. For this purpose, they have utilized the data from 1989 to 2008 and applied the Pearson correlation and ANOVA method. Results have shown that there is short run relationship between fluctuation in oil price and stock exchange of Pakistan[1].

Achraf Ghorbel, Examined that oil prices have short run association with the stock exchange of India. For this purpose, they have utilized the data from 1981 to 2001 and applied the classical regression model, best linear unbiased estimates (BLUE). Results have shown that there is short run relationship between fluctuation in oil price and stock exchange of India[2].

Abdul et al, Analyzed that oil prices have negative association with the stock exchange of Tehran. For this purpose, they have utilized the data from 1990 to 2010 and applied the Regression, Granger-causality test and vector autoregressive (VAR) model. Results have shown that there is short run relationship between fluctuation in oil price and stock exchange of Tehran[3].

Al-Fayoumi, N. A., Khamees, B. A., & Al-Thuneibat, A. A Found that oil prices have negative association with the stock exchange of Nigeria. For this purpose, they have utilized the data from 1985 to 20085 and applied the Augmented Dickey Fuller Unit Root Test, Johansen co-integration test. Results have shown that there is short run relationship between fluctuation in oil price and stock exchange of Nigeria[4].
Amano, R. A., & Van Norden, S. Observed that oil prices have negative association with the stock exchange of Japan. For this purpose, they have utilized the data from 1995 to 2005 and applied the Zivot-Andrews Unit Root Test, F-Bound Co-integration and Toda and Yakama to Causality tests. Results have shown that there is short run relationship between fluctuation in oil price and stock exchange of Japan [5].

Chu-Chia et al, Viewed that oil prices have negative association with the stock exchange of Ghana. For this purpose, they have utilized the data from 1989 to 2008 and applied the Unit Root Test, Co-integration and Granger Causality Test. Results have shown that there is short run relationship between fluctuation in oil price and stock exchange of Ghana[6].

Cheng, H-F Gutierrez, M.,Mahajan, A.,Shachmurove, Y. and Shahrokhi, M. Found that oil prices have negative association with the stock exchange of Malaysia. For this purpose, they have utilized the data from 1980 to 2001 and applied Johansen co-integration test and vector error correction model. Results have shown that there is short run relationship between fluctuation in oil price and stock exchange of Malaysia[7].

Chung, Analyzed that oil prices have negative association with the stock exchange of Iran. For this purpose, he have utilized the data from 1985 to 2005 and applied Co-integration and Vector Error Correction Method (VECM). Results have shown that there is short run relationship between fluctuation in oil price and stock exchange of Iran[8].

Denial et al, Examined that oil prices have negative association with the stock exchange of Sri Lanka. For this purpose, he has utilized the data from 1990 to 2011 and applied the Pearson correlation and ANOVA method. Results have shown that there is short run relationship between fluctuation in oil price and stock exchange of Sri Lanka[9].

El Hedi,(Observed that oil prices have negative association with the stock exchange of France. For this purpose, he has utilized the data from 1989 to 2008 and applied the Pearson correlation and ANOVA method. Results have shown that there is short run relationship between fluctuation in oil price and stock exchange of France[10].

Gerben Driesprong et al Analyzed that oil prices have negative association with the stock exchange of Jordan. For this purpose, he has utilized the data from 1991 to 2011 and applied the Regression, Granger-causality test and vector autoregressive (VAR) model. Results have shown that there is short run relationship between fluctuation in oil price and stock exchange of Jordan[11].

Chen, J., Hong, H., & Stein, J. C. Viewed that oil prices have negative association with the stock exchange of Brazil, Russia, India and China. For this purpose, they have utilized the data from 1989 to 2008 and applied the Unit Root Test, Co-integration and Granger Causality Test. Results have shown that there is short run relationship between fluctuation in oil price and stock exchange of Brazil, Russia, India and China[12].

Jimenez Rodriguez, R., & Sanchez, M. Found that oil prices have negative association with the stock exchange of USA. For this purpose, they have utilized the data from 1986 to 2006 and applied Johansen co-integration test and vector error correction model. Results have shown that there is short run relationship between fluctuation in oil price and stock exchange of USA [13].
James D. Hamilton, Examined that oil prices have negative association with the stock exchange of UK. For this purpose, they have utilized the data from 1991 to 2012 and applied the Pearson correlation and ANOVA method. Results have shown that there is short run relationship between fluctuation in oil price and stock exchange of UK [14].

Kaul, G., & Seyhun, H. N. Analyzed that oil prices have negative association with the stock exchange of Russia. For this purpose; they have utilized the data from 1995 to 2015 and applied the Regression, Granger-causality test and vector autoregressive (VAR) model. Results have shown that there is short run relationship between fluctuation in oil price and stock exchange of Russia [15].

**Gaps in literature:**
1) In the prior studies, they did not discuss about the alternative of oil.
2) In the past studies did not discuss about the impact of increase oil prices on the prices of commodities.
3) In the last studies did not explain properly about the how can control oil price factor.
4) In the last studies did not explain that increase oil prices are the major reason of inflation.

**Methodology:**

In this paper, we have taken the data of 19 years of both stock exchanges and oil prices. We have taken the data from 1989 to 2010. We have seen that in these years increase in oil prices caused the increase of the prices of different commodities. Most of the theories suggest, there is association between changes in the oil prices and aggregate economic. The main goal of this paper is to investigate the association between oil prices and stock prices of Pakistan and Malaysia. The literature is showing that (Chen, J., Hong, H., & Stein, J. C) there is the negative association between oil prices and stock prices of all developing and under developing countries. (Donoso et al, 2009) is showing there is also weak relationship between oil prices in china stock exchange. We have taken the stock prices as the dependent variables and oil prices as the independent variables.

**Data analysis:**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>KSE</td>
<td>11.2</td>
<td>165.4</td>
</tr>
<tr>
<td>KLSE</td>
<td>22.5</td>
<td>240.8</td>
</tr>
<tr>
<td>OIL PRICES</td>
<td>16.12</td>
<td>95.26</td>
</tr>
</tbody>
</table>
For the analysis of data, we have taken the correlation and regression analysis. Descriptive analysis is helpful to calculate the mean value of data of dependent and independent variables and standard deviation shows that standard deviation of its mean value. The results of correlation have shown that there is positive relationship between oil prices and stock exchange of Pakistan. The level of sensitivity is more in Malaysia than Karachi stock exchange.

**Table 2. Correlation Matrix**

<table>
<thead>
<tr>
<th>Variables</th>
<th>OIL PRICES</th>
</tr>
</thead>
<tbody>
<tr>
<td>KSE</td>
<td>0.772</td>
</tr>
<tr>
<td>KLSE</td>
<td>0.833</td>
</tr>
</tbody>
</table>

KSE = -20.3 + 1.86 oil prices

The regression analysis showed that there is significant relationship between both dependent and independent variables. This result is showing that all the independent variables are more efficient.

KLSE = -32.9 + 3.02 oil prices

This equation is showing that there is significant relationship between stock prices and international oil prices. The standard deviation is explaining the standard deviation of the risk level.

**Table 3. Regression Analysis**

<table>
<thead>
<tr>
<th>STOCK PRICES</th>
<th>R</th>
<th>R-SQ</th>
<th>ADJ R-SQ</th>
</tr>
</thead>
<tbody>
<tr>
<td>KSE</td>
<td>32.428</td>
<td>59.5</td>
<td>57.4</td>
</tr>
<tr>
<td>KLSE</td>
<td>42.7</td>
<td>69.24</td>
<td>67.6</td>
</tr>
</tbody>
</table>

Table no 3 is shown that there is correlation between both dependent and independent variables which has shown the 32.428 and value of (R-SQ) there is 59.5% bring variation on the dependent variable.
table is helpful to explain the model is fit value is also showing the fitness of the model. The value of p is showing that model is significant. The purpose of this paper is to show the association between international oil prices and stock market of Pakistan and Malaysia. Most of the countries like Pakistan import more oil from another country and increase and decrease the prices of fuel has the impact on the economy of any country. Other studies also trying to explore that we can control the oil prices itself and get utilized the gas in the place of oil.

Conclusion:

There might be some other variables which caused the changes in the variability of the stock exchange. But in this paper, we have taken the impact of oil prices on the performance of the stock market of Pakistan and Malaysia. Different researchers had proved there are also some hidden variables which have also very huge impact on the stock market performance. Our result is showing that there is negative relationship between both stock exchange and oil prices. We had taken the data from year 1991 to 2011 of both stock exchanges. Our results are showing that in these years oil prices were high, therefore the recital of both stock market were meager. Our study is showing that oil prices are the uncontrollable factor which has influenced on the development of the economy. Different researchers proved that those factors which impact on the stock market prices are known as the economical factors.

Recommendation:

1) There should be proper policy in the uncertain condition to take decision about the investment in the stock market.
2) Oil prices are uncontrollable variable therefore government should implement such policy to control it.
3) Forecasting is the better way for the investment in the stock market.

References:


