# Corruption: Impacts of Economic, Social and Personal Factors

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## ABSTRACT

*Corruption as the frustrating factor is the main concern of the modern world of today. Trying to minimize the corruption and its effects require to find out the causes. Knowing the causes of corruption enable the societies, communities, organizations, bureaus and offices to predict, verify and manage any form of corruption that may occur. This is a comprehensive research work in which economic, social and personal predictors are studied separately and in corporation with other predictors (if significant) to find out the related causes on corruption. Money laundering, inflation and non-performing loan as the significant economic factors in this survey indicate that increasing in the value of each predictor cause the increasing of corruption consequently. In social factors model, higher confliction causes higher corruption while press freedom and migration have a minor positive impacts on corruption. In personal factors model, education and religion have respectively reversal and direct relationship with corruption.*

**Keywords**: Conflict Rate, Corruption, Money Laundering, Non-Performing Loan, Religion

## Introduction

Corruption is simply known as misuse of public power for private gain. The definition can be broadening due to the types and conditions. Well definition of corruption is easily possible but reaching to the kind of well treatment and solution is not as easy as definition. Verification of corruption and its management can help the policy makers to fill the gaps for any possible form of corruption. Empirical research of cross countries data uncovers the astonishing facts. This research work has studied the impacts of some economic, social and personal variables on corruption. Data are collected from reliable sources for investigation and statistical analysis. The data analysis shows that how money laundering, inflation, non-performing loan and poverty as selected economic factors impact on corruption. It also gives the clue to anticipate and verify corruption on the basis of nominated social factors such as conflict rate, press freedom and migration. Education and religious as the most involving personal predictors were analytically described.

## Literature review

D. Chaikin (2008): "The recursive links between corruption and money laundering suggest that policies which are addressed to fighting both corruption and money laundering may have a mutually reinforcing effect".

J.C. Sharman and D. Chaikin (2008): "Systems of laws, regulations, and institutions developed to counter money laundering provide powerful tools for fighting corruption". J.C. Sharman and D. Chaikin (2009): "Corruption and money laundering are symbiotic: not only do they tend to co-occur but more importantly the presence of one tend to create and reciprocally reinforce the incidence of the other. The twin problems of corruption and money laundering together have a devastating impact on national economies, international security and human development."

Al Marhubi (2000) studied relationship between corruption and inflation. He claimed that on the basis of his studies used cross-sectional data of 41 countries 1980 to 1995, corruption increases inflation. Gets and Volkema (2001) also found in their research that corruption increases when inflation go up. Paldam (2002) studied the corruption in economy. Using the least square method and studying 100 developed and developing countries economic and cultural data, he found that inflation can effect corruption for a short period of time like 5 to 10 years. Ata (2009) also studied corruption in field of economic and social factors over 25 EU member countries 2004-2007. He found that inflation causes corruption.

K. Goela & Iftekhar Hasanbc (2011): "This study investigates the effects of economy-wide corruption on bad loans across a large sample of countries. The evidence reveals that greater corruption is associated with more bad loans. Loan defaults are lower in faster growing economies, in economies with higher lending rates and in nations in the Euro zone, ceteris paribus."

Studies on relationship between corruption and poverty are mainly considering corruption as the cause of poverty. Krueger (1974) and Rose-Ackerman (1978) in their studies' conclusion claimed that corruption may cause kind of distortions in which some group may benefit more than others.

There is no specific research and theory background about the conflicts and its effect on corruption but it can only refer to the world bank publication by Paul Collier (2003) named "breaking the conflict trap: civil war and development policy" in which indicates the different aspects of civil war and its tremendous consequences on humanity as well as social and economic development.

Shyamal.K.Chowdhury (2004), S.Freille, M.Emranul Haque, R.Kneller (2007), A.Brunetti and B.Weder (2008) show in their empirical investigation that press freedom has a significant impact on corruption.

Regarding the impacts of migration on corruption, there is no theory background but E.Dimant, T.Krieger and D.Meierrieks (2013) made an investigation on the effect of corruption on migration 1958-2000. They found corruption as the cause of migration especially regarding skilled migration.

H.Y.Cheung and Alex.W.H.Chan (2008) found in their research that increasing the number of people participating in tertiary education causes the decreasing of corruption.

H.Yeganeh and D.Sares (2013): "religion not only impedes corruption but it may promote this behavior". LeilaShadabi (2013): "religion is an internal factor and has no effect to stop corruption. It will not also

increase the probability of corruption." (Study has been done among two religious _ Islam and Christianity.)

## Data

This survey studies the impacts of some economic, social and personal variables on corruption across 87 countries. The list includes all developed and less developed countries with different ranking in political and social arenas to achieve a valid and nonbiased outcome.

(*Insert Table 1 here*)

Data are collected from the official and reliable sources for the time period 2012-2015.

Export, import, inflation, poverty, money laundering, direct investment and non-performing loan are seven financial-economic variables which their possible effects will be studied on corruption among countries.

Some social variables such as rule of law, press freedom, conflict rate, women in parliament, women in labor force and migration are also considered in this study as the predictors of corruption.

Personal variables such as education, age and importance of religion in an individual daily life also have been analyzed to find out how much personal specification can predict the probability of corruption.

In statistical analysis, there are always qualitative indexes such as honesty, selfishness and faithfulness which are difficult or sometimes impossible to be revealed or measured. There are also other facts and variables that no one can guarantee its measuring with accuracy since they are not interested to be publicly exposed. For instance, an individual may not necessarily reply honestly about its own experiences on corruption as bribe taker or giver. Corruption is one of those variables in which data collection take the both probability of impossibility and risk of inaccuracy. That is why the direct data collection method via interview or questionnaire is not applicable in this survey.

A global coalition against corruption called "transparency international" scores countries annually on how corrupt their public sectors are seen to be. Each score indicates the perceived level of each society on corruption ranging from zero (highly corrupted) to 100 (very clean). This index implies the perception of each country on corruption as well as all efforts spent to better understanding and fighting corruption. It should be noted that CPI (corruption perceiving index) is simply a definition of the public understanding of corruption (not the level of corruption itself).

## Models

This paper analyzes the corruption and its variables by using the regression models as follows:

1. Simple regression model for each variable separately
2. multiple regression for each of economic, social, and personal predictors

3. Compounding multiple regression consists of selective significant variables

At the first stage and its simplest form, the simple linear regression is performed to estimate the single relationship between independent and dependent variable separately. In this phase, all 16 predictors are involving in modeling but later in multiple and compounding multiple regression modeling some of them may be excluded from survey due to technical reasons such as lack of significance, low goodness of fit, multi-collinearity and high correlation.

## 1. Simple predictor regression model

1.1. Economic sector

Analyzing seven selected economic predictors on cross countries data by office excel regression gives the following output:

(*Insert Table 2 here*)

Regression model will be: $y_i = \alpha + \beta x_i + \varepsilon_i$ (1)

In which:
Y: dependent variable (CPI)
α: intercept or constant value for dependent variable CPI
X: independent variable (predictor)
β: coefficient of independent variable which may be up or downward depending on the slope sign
ε: squared residual

Then single regression model for the economic section predictors will be as:
CPI = 101.57 + (-9.87) ML

CPI = 63.28 + (-2.67) IN

CPI = 53.04 + (-.80) NPL

CPI = 62.18 + (-.60) P

CPI = 40.19 + (0.15) IMP

CPI = 37.71 + (0.22) EXP

CPI = 46.27 + (7.11E-11) DI

Negative sign of related coefficient of ML, IN, NPL, and P indicates a negative relationship between money laundering, non performing loan and poverty with CPI while the positive slop of last three regression models for IMP, EXP, and DI imply a positive relationship between import, export and direct investment with corruption perception index.

The value of CPI in above models is fluctuating by coefficient. It means that by one unit increasing in ML, IN, NPL and P, the corruption perceiving index will decrease for 91.7, 60.61, 52.24 and 61.58 units respectively. On the other hand, one unit increasing in import, export and direct investment will cause 40.34, 37.93 and 46.27 unit progress in perceiving the corruption. It should be noted that value of coefficient in direct investment is too small to make any changes on CPI.

1.2. Social sector

Six social independent variables have been selected in this survey. Regression analysis results are shown as follows:

(*Insert Table 3 here*)

Considering CR, PF, MIG, WIP, WIL, and ROL respectively as the abbreviations for

conflict rate, press freedom, migration, women in parliament, women in labor force and rule of law then related single models are:

CPI = 110.06 + (-31.96) CR
CPI = -14.57 + (0.88) PF
CPI = 47.35 + (9.3E-0.6) MIG
CPI = 37.36 + (0.46) WIP
CPI = 37.56 + (0.2) WIL
CPI=-20.90+ (129.54) ROL

The equations show that all predictors except the one related to conflict rate have positive slope with CPI in which press freedom, migration, women participation in parliaments, and women in labor force increase the public perception of corruption while more conflict  and tension leads to reduction in corruption perception and consequently may increase corruption.
Noticing to negative intercept in the models of "press freedom" and "rule of law" reveal the fact that the imaginary society without any of these two aforesaid variables is initially a corrupted public with the absence of minimum CPI for 14.75 and 20.90 units. This absence can be compensated only by increasing the press freedom or rule of law solely, ceteris paribus.

1.3. Personal sectors

As it is already mentioned, there are variables which are either difficult or even impossible to measure. Due to qualitative identity of personal variables, there will be always limitation for measuring. That is why the personal factors of this research have the smallest list of predictors.

The output of regression analysis of education, religion and age is shown in the table below:

(*Insert Table 4 here*)

As per the above table, the regression models of personal variables in corruption are as follows if EDUC, RELIG, and AGE respectively stand for education, religion and age:

CPI = -19.25 + (97.12) EDUC
CPI = 78.20 + (-45.26) RELIG
CPI = 1.33 + (1.46) AGE
The models show that public perception of corruption has positive relationship with education and age while it has negative relationship with importance of religion. It should be noted that constant value of CPI is negative in education regression model.
The selected significant, fitted and valuable predictors for multiple regressions of some economic, social and personal factors on corruption were solely investigated so far. This may give us a simple primitive view of the corruption and its causes but it would not be a comprehensive analysis to give a real viewpoint on corruption in the multiple variable involvements in which each factor has a separate impact on perceiving the corruption and other factors as well. For this purpose, the multiple regressions among the predictors of each sector are performed. Before that, each variable and its regression output should be tested and the goodness of fit to be considered. Insignificant or weak predictors will be excluded for intersection multiple regression.

**Significant, fitted and valuable variables**

Economic variables:

Seven economic variables are ***significant*** in their model since $|T_{stat}| > T_{critic}$ (table 2). T distribution critical value ($T_{critic}$) for one tailed test with α value of 5% is 1.66. ***Goodness of fit*** in a regression describes how well that model fits a set of related observation. In the economic regression models outcome, non-performing loan, import, export and direct investment with the R-square value of 0.06, 0.06, 0.15 and 0.04 respectively have the lowest fitness of model with observations. In addition to low goodness of fit, import, export and direct investment have the ***lowest value of coefficients*** among the other selected variables. Therefore, they are excluded from the list of economic variables in the next phase of survey-intersection multiple regressions-.

(*Insert Table 5 here*)

Since -1≤ corr ≤ +1, it extends from highly non-correlated (-1) to highly correlated (+1). Table 5 shows the acceptable correlation among economic predictors so that it does not affect the analysis.

Social variables:

As per the social variables regression (table 3), "women in labor force" is ***not significant*** since $|T_{stat}| < T_{critic}$. "Women in parliament" variable has a ***low goodness of fit*** for 0.07 as well as a ***weak coefficient*** for 0.46.

"Rule of law" with a high value of goodness of fit for 85% and $T_{stat}$ value of 21.94 as well as a strong coefficient for 129.54 attract the attentions. Is this good in the analysis of regression model? Rule of law is a comprehensive concept which consists of series of many other social factors such as constrain on government power, absence of corruption, open government, fundamental rights, order and security, regulatory enforcement, civil justice, criminal justice and informal justice(The World Justice Project Organization). This comprehensiveness causes an absolute dominance of rule of law over other variables which may converted them as the insignificant variables in multiple regression models.

*High negative correlation* between "rules of law" and "conflict rate" for -0.74 as well as high positive correlation between "rules of law" and "press freedom" for 0.62 can be seen in the social factors' correlation table (table 6) as follows:

(*Insert Table 6 here*)

Insignificancy, low goodness of fit and multi-collinearity respectively cause the exclusion of "women in labor force", "women in parliament", and "rules of law" from next stage of survey.

Personal variables:

In the personal section, all three variables_ education, religious and age_ are significant since $|T_{stat}| > T_{critic}$ but multi-colliniarity between age and other predictors for 0.83 and -0.74 (table 7) eliminate it from the predictors list for multiple regression model performing later in this work.

(*Insert Table 7 here*)

## 2. Multiple regression models

Simple multiple regression is the least square estimator with only a single variable. This regression model performs an explanation of the only independent variable while many other factors and estimators naturally ignored. The survey will be stronger when the impacts of predictors over CPI are investigated along with other variables in the same model of regression.

2.1. Economic regression model:

After performing the multiple regressions for four economic variables _ money laundering, inflation, non-performing loan and poverty_ which their significance as well as goodness of fit have already been confirmed in single regression, the output is as following table:

(*Insert Table 8 here*)

Presuming the condition that:

- The model is linear parameter: $Y = \alpha + \beta_1 \chi_1 + \beta_2 \chi_2 + \cdots + \beta_n \chi_n + \varepsilon$    (2)
- None of the $\chi$ variable is constant and there is no perfect collinearity
- Conditional mean is zero
- Model is homoscedastic (homogeneity of variance)
- There is no serialized correlation

We can create the economic predictor model as follows:

$$CPI = 101.49 + (-5.55) \, ML + (-1.55) \, INF + (-0.97) \, NPL + (-0.33) \, P + \varepsilon_0$$

The economic multiple regression model has four variables with 57% goodness of fit. It shows that the model has an acceptable level of fitness with set of observation. The model indicates that all predictors have negative relationship with corruption perception index (direct relationship with corruption) . presuming no residual, it means by one unit increasing in money laundering, inflation, non-performing loan and poverty together, the perception index of corruption decreases(corruption may increases) for 93.09 units.

$$CPI = 101.49 + (-5.55) + (-1.55) + (-0.97) + (-0.33)$$

**CPI= 93.09**

In this model, money laundering and inflation have the greater portion and non-performing loan and poverty have the small shares of impacts over corruption.

There is a mutual impact among corruption and money laundering. Corruption can be considered as the cause to interfere the anti-money laundering normal policy. This means that laundering the dirty money may cause corruption. This also can be defined as paying / receiving dirty money to laundry much more dirty money. That is why it is necessary to establish comprehensive strategies to fight corruption and money laundering at the same time.

Non-performing loans or bad loans are loans in default due to either inability or unwillingness of borrower or both of them. Initially, corruption is one of the major reasons for non-performing loans especially in the developed and industrial countries. In lending issues, corruption may cause fading or neglecting the importance of borrower 5 c's (capacity, collateral, capital, conditions and character) which most probably would be ended to non-performing or bad loan. The

role of corruption and NPL may be shifted. NPL can also cause the corruption when borrower is extremely tended to keep his records clear and upgrade and in other hand financial institutes are concerned about their performance. Rescheduling the bad loans_ either against any personal benefit or merely keeping the FI's performance justified_ encourages both parties being involved in any possible form of corruption.

Inflation is defined as the constant raise of the price level for goods and services and poverty happens consequently when the public purchasing power falls due to inflation. Regression model indicates that increasing of inflation and poverty among the model may increase corruption as well.

**Hypothesis test**

In hypothesis test, significance of total regression as well as the coefficient of each predictor is tested.

1. Testing the significance of total regression:

This test determines if there is any linear relationship between dependent variables CPI and predictors.

Hypothesis:

$$\begin{cases} H_0: \beta_1 = \beta_2 = \beta_3 = \beta_4 = 0 \\ H_A: \beta_j \neq 0 \end{cases}$$

(3)

Rejecting the null hypothesis ($H_0$) indicates that at least one of the predictors significantly contributes to the model.

- Significance of 95% , α=0.05

- $F_{stat} = \dfrac{mean\ square\ regression}{mean\ square\ error} =$
  $\dfrac{4452.94}{166.79} = 26.70$

- $F_{critical}\ (df_1, df_2) = F_{critical}\ (4,82)$ for α=0.05

- Since $F_{stat} > F_{critical}$ , we reject null hypothesis and alternative hypothesis will be acceptable

2. Testing the significance of model coefficients:

Hypothesis

$$\begin{cases} H_0: \beta_j = 0 \\ H_A: \beta_j \neq 0 \end{cases}$$
(4)

Accepting null hypothesis for each variable means that specific predictor is insignificant in the model.

- Significance of 95% and α=0.05

- $T_{stat} \begin{cases} ML = -3.56 \\ INF = -3.92 \\ NPL = -3.94 \\ P = -3.21 \end{cases}$

- $T_{critical} = 1.6636$ (at one tailed probability for degree of freedom of 82 and α=0.05)

- Since $|T_{stat}| > T_{critical}$ for each predictor, we reject null hypothesis for each single variable.

**P value test**

At 95% confidence level, the p value for each variable is smaller than α=0.05. It reconfirms rejection of null hypothesis.

(*Insert Table 9 here*)

2.2. Social regression model

After checking the significance and goodness of fit of social factors in simple regression model, the ultimate selected predictors and the regression analysis output are as follows:

(*Insert Table 10 here*)

Assuming the same pre-condition considered earlier, social regression model will be:

$$CP\ I = 73.92 + (-24.18)\ CR + (0.92)\ PF + (4.6E\text{-}06)\ MIG + \varepsilon_0$$

The equation shows a reverse relationship between corruption perceiving and conflict rate (direct relationship between corruption and conflict rate) while the model indicates a direct relationship between corruption perceiving and press freedom as well as migration.

The model shows a strong coefficient for conflict rate. War, revolution, revolt, sanctions and any form of distortion in public peace and rule of law provide the black markets for any trade which can be easily invested by corruption. Lack of supervision, auditing and rule of law in these conditions are main reasons for higher rate of corruption.

As per the model, press freedom and migration have weak impacts on corruption. Migration is emigration from home country and immigration to the host country. This logically happens from less developed countries where corruption is highly expected

to developed countries in which powers are restricted by law. After movements to the society where activities are extremely monitored by legal authority, immigrants with any background have to be bided to the host area rules otherwise they confront with deprivation of social rights, punishment or rejection. That is why such a small value for migration as one of the social predictors in the model would be expected.

**Hypothesis test**

As it is done earlier for economic model, significance of total regression model and coefficient of each variable are tested.

1. Testing the significance of total regression

   Hypothesis:
   $$\begin{cases} H_0: \beta_1 = \beta_2 = \beta_3 = 0 \\ H_A: \beta_j \neq 0 \end{cases}$$
   (5)

Rejecting the null hypothesis ($H_0$) indicates that at least one of the predictor significantly contributes to the model.

- Significance of 95% , α=0.05
- $F_{stat} = \dfrac{mean\ square\ regression}{mean\ square\ error} = \dfrac{6228.75}{154.25} = 40.38$
- $F_{Critical}\ (df_1, df_2) = F_{Critical}\ (3,83)$ for α=0.05
  $F_{Critical} = 2.7146$
- Since $F_{stat} > F_{critical}$ , null hypothesis will be rejected and alternative hypothesis is acceptable.

2. Testing the significance of model coefficients

Hypothesis:

$$\begin{cases} H_0: \beta_j = 0 \\ H_A: \beta_j \neq 0 \end{cases}$$
(6)

Accepting null hypothesis of each predictor means the insignificance of the same.

- Significance of 95% , $\alpha = 0.05$
- $T_{STAT}: \begin{cases} CR = -5.94 \\ PF = 2.20 \\ MIG = 2.51 \end{cases}$
- $T_{Critical} = 1.6634$ (at one tailed probability for degree of freedom 83 and $\alpha=0.05$)
- Since $|T_{stat}| > T_{critical}$ for each predictor, we rejected null hypothesis for each single variable

**P value test**

Rejection of null hypothesis can be confirmed by studying P value of each variable in social model:
Social variables' P values $< \alpha= 0.05$

(*Insert Table 11 here*)

2.3.Personal regression model

Education and religious are two predictors of the personal regression model in this survey. The following table is the regression output:

(*Insert Table 12 here*)

Regression model for the above information table will be as follows:

CPI = 7.57 + (74.43) EDU + (-16.56) RELIG

This model shows a direct relationship between CPI and education and a reversal relationship with religion. Education, especially in its higher level increases the individual commitment and consequently creates an organizational engagement in which level of corruption perceiving is higher.

In this survey, religion is not considered on the basis of numbers of believers in each country (as it is done in some other research work) but it has been measured by its importance in the nations 'daily life. Surprisingly, the model reveals that the religious not only decrease the corruption but it has negative impacts over the CPI.

**Hypothesis test**

To check the significance of the model, test for total regression models and variables coefficient are tested separately:

1. Testing the significance of total regression

Hypothesis
$$\begin{cases} H_0: \beta_1 = \beta_2 = 0 \\ H_A: \beta_j \neq 0 \end{cases}$$
(7)

Rejecting the null hypothesis $(H_0)$ implies that at least one of the predictors significantly contributes to the model.

- Significance of 95% , $\alpha = 0.05$

- $F_{stat}$ = $\dfrac{mean\ square\ regression}{mean\ square\ error}$ = $\dfrac{8067.15}{182.79} = 44.13$

- $F_{Critical}$ ( $d_{f1}, d_{f2}$ ) = $F_{Critical}$ (2,84) for $\alpha = 0.05$

  $F_{critical} = 3.1052$

- Since $F_{stat} > F_{critical}$ , null hypothesis will be rejected and alternative hypothesis ( $H_A$ ) is acceptable.

2. Testing the significance of model coefficient

   Hypothesis:

   $\begin{cases} \text{H}_0 \colon \beta_j = 0 \\ \text{H}_A \colon \beta_j \neq 0 \end{cases}$

   (8)

- Significance of $95\%$ , $\alpha = 0.05$

- $T_{stat} \colon \begin{cases} \text{EDUC.} = 4.83 \\ \text{RELIG.} = -2.03 \end{cases}$

- $T_{Critical} = 1.6632$ ( one tailed probability for degree of freedom 84 and α= 0.05)

- Since $|T_{stat}| > T_{critical}$ for each predictor, we rejected null hypothesis for each single variable

**P value test**

P values of personal predictors are smaller than $\alpha$ . It confirms the rejection of null hypothesis.

(*Insert Table 13 here*)

3. **Compounding multiple regression**

In addition to the study of each of 16 variable solely and analysis 9 out of 16 in categorized economic, social, and personal sectors, this research work evaluate a compounding model which consists of 7 variables out of 16 predictors. It also tries to study the impacts of different section predictor on corruption together. In this model the values and impacts of each predictor may or may not be different of what they have had in a simple or multiple regression model since each section predictor may or may not effects on the other section predictor(s) depending on conditions and selected variables.

This model looks more practical and applicable in the real world of corruption where many factors from different section determine the definition, prediction, prevention of corruption and the ways of fighting as well.

Money laundering, non-performing loan and poverty from economic sections, press freedom, conflict rate and migration from social section and religion from personal section are total 7 variables involved in the compounding model. The regression analysis outputs are as follows:

(*Insert Table 14 here*)

Assuming the pre-condition we already applied for other section regression, the compounding regression model will be:

**CPI = 95.30 + (0.22) PF+ (-15.54) CR + (-2.73) ML + (-13.37) RELIG + (-0.67) NPL + (-0.2) P + (3.50E-06) MIG + $\varepsilon_0$**

The model shows that press freedom and migration have direct positive relationship with corruption perceiving index while conflict rate, money laundering, religion,

non-performing loan and poverty have negative relationship with corruption. The following table compares the coefficient of variables in compounding model with the same variable coefficient in simple and multiple regression models.

(*Insert Table 15 here*)

It shows that coefficient of variable have the same slope direction in three regression models. It means that predictor's relationship with corruption in three models remains unchanged. Moreover, the table indicates that the value of coefficients with both negative and positive slopes get weaker from simple regression model to compounding model except "non-performing loan" which has a fluctuation in multiple regression model.

**Hypothesis test**

Similar to economic and multiple regression model, total regression model and coefficient of each variable are tested.

1. Testing the significance of total regression

   - hypothesis

   $$\begin{cases} H_0: \beta_1 = \beta_2 = \cdots = \beta_7 = 0 \\ H_A: \beta_j \neq 0 \end{cases}$$
   (9)

   Rejecting the null hypothesis (($H_0$) indicates that at least one of the predictor significantly contributes to the model.

   - Significance of 95% , $\alpha = 0.05$

- $F_{stat} = \dfrac{\text{mean square regression}}{\text{mean square error}}$

  $= \dfrac{3299.8179}{106.20499} = 31.07$

- $F_{critical} \quad ( \quad d_{f1}, d_{f2} \quad ) \quad = F_{critical}(2,84)$ for $\alpha = 0.05$
  
  $F_{critical} = 2.1278$

- Since $F_{stat} > F_{critical}$ , null hypothesis will be rejected and alternative hypothesis ($H_A$) is acceptable.

2. Testing the significance of model coefficients

   Hypothesis

   $$\begin{cases} H_0: \beta_j = 0 \\ H_A: \beta_j \neq 0 \end{cases}$$
   (10)

   Accepting the null hypothesis for each variable means that specific predictor is insignificant in the model.

   - Significance of 95% , $\alpha = 0.05$

   - $T_{stat}: \begin{cases} PF = 1.88 \\ CR = -4.14 \\ ML = -1.99 \\ RELIG = -2.42 \\ NPL = -3.33 \\ P = -2.19 \\ MIG = 2.23 \end{cases}$

   - $T_{critical}=1.6644$ (at one tailed probability for degree of freedom 79 and $\alpha = 0.05$)

   - Since $|T_{stat}| > T_{critical}$ for each predictor, we rejected null hypothesis for each single variable

**P value test**

Rejection of null hypothesis and accepting the alternative can be confirmed by P value table of each predictor in compounding regression model:

Compounding variables' P value $< \alpha = 0.05$

(*Insert Table 16 here*)

## Conclusion

Fighting corruption is the costly and time consuming action while handling its outcomes and consequences and side effects are much more costly and even destroyer. Corruption is simply created in a form of mutual verbal agreement (benefit) and can be easily spread to the whole organization and society. It acts as a virus and weakens the social morality first and gradually infects society and related economy. These domino effects are too fast. It ruins the social systems over couple of years but it may takes more than decades to recover the systems if the willing exists.

In this study, it is shown that economic disorders cause corruption. This is when the owners of money with illegal sources find the chance to refine their money by transferring and transforming. Corruption may also happen when the prices constantly increase while the local currency devalued. In this condition, people gradually lose the purchasing power and poverty will be born. Borrowing looks the first and maybe the best solution of poverty in poor societies. That is why the requests for loans or rescheduling the non-performing loan may trigger corruption. The social issues also can influence corruption. Wars, revolutions, riots, unrests, sanctions, internal and international disputes are all conditions in which corruption can grow fast. In the above mentioned situation,

sales, imports, exports, guarantees, contracts and all official commitment can be ignored or misused to serve the personal or single party's benefits. Press freedom is expected to increase the public perception of corruption due to exposing the secrets and hidden corrupted issues but this often happen in the democratic societies where rules of law initially limited corruption. In autocratic political system, the media and press are whether the speakers of power cores or they will be shut down in case of any disclosure endangering the powers and benefits. Migration as a social phenomenon showing a minor cause on corruption since leaving the home countries does not affect corruption and entering to the host countries will not change the level of corruption when the immigrants find themselves obedient to the rules and regulation of host countries.

In the personal factors, education and religion are studied. Education increases the knowledge. It is a unique skill which is less possible to be easily dealt or corrupted. On the other hand and in spite of the common belief, the survey shows that religion never mitigates the corruption but it relatively causes corruption. No doubt that corruption has been blamed by religious advices in all religions but pretending of being religious particularly in religious societies is disguising and makes it difficult to unmask the corruption. Bringing selective variables of all three factors together as a compounding model also confirm the research outcome.

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## List of Tables

### Table 1- Selected countries among continents

| ASIA | NORTH AMERICA | CENTRAL AMERICA | SOUTH AMERICA | EUROPE | MIDDLE EAST | AFRICA | OCEANIA |
|------|---------------|-----------------|---------------|--------|-------------|--------|---------|
| 19 | 8 | 2 | 9 | 31 | 3 | 14 | 1 |

### Table 2- selected economic predictors (simple regression output)

| PREDICTORS | R SQUARE | T stat | TEST | INTERCEPT | COEFFICIENT(β) |
|------------|----------|--------|------|-----------|----------------|
| MONEY LAUNDERY | 0.32 | -6.40 | \|t stat\| > t critical | 101.57 | -9.87 |
| INFLATION | 0.31 | -6.22 | \|t stat\| > t critical | 63.28 | -2.67 |
| NPL | 0.06 | -2.29 | \|t stat\| > t critical | 53.04 | -0.80 |
| POVERTY | 0.24 | -5.22 | \|t stat\| > t critical | 62.18 | -0.60 |
| IMPORT | 0.06 | 2.37 | \|t stat\| > t critical | 40.19 | 0.15 |
| EXPORT | 0.15 | 3.80 | \|t stat\| > t critical | 37.71 | 0.22 |
| DIRECT INVESTMENT | 0.04 | 1.78 | \|t stat\| > t critical | 46.27 | 7.11147E-11 |

### Table 3- selected social predictors (simple regression output)

| PREDICTORS | R SQUARE | T stat | TEST | INTERCEPT | COEFFICIENT(β) |
|------------|----------|--------|------|-----------|----------------|
| CONFLICT RATE | 0.52 | -9.68 | \|t stat\| > t critical | 110.06 | -31.96 |
| PRESS FREEDOM | 0.38 | 7.28 | \|t stat\| > t critical | -14.57 | 0.88 |
| MIGRATION | 0.14 | 3.67 | \|t stat\| > t critical | 47.35 | 9.3E-06 |
| WOMEN IN PARLIAMENT | 0.07 | 2.51 | \|t stat\| > t critical | 37.36 | 0.46 |
| WOMEN IN LABORFORCE | 0.02 | 1.25 | \|t stat\| < t critical | 37.56 | 0.20 |
| RULE OF LAW | 0.85 | 21.94 | \|t stat\| > t critical | -26.90 | 129.54 |

### Table 4- selected personal predictors (simple regression output)

| PREDICTORS | R SQUARE | T stat | TEST | INTERCEPT | COEFFICIENT(β) |
|------------|----------|--------|------|-----------|----------------|
| EDUCATION | 0.49 | 9.01 | \|t stat\| > t critical | -19.25 | 97.12 |
| RELIGION | 0.38 | -7.17 | \|t stat\| > t critical | 78.20 | -45.26 |
| AGE | 0.40 | 7.51 | \|t stat\| > t critical | 1.33 | 1.46 |

Table 5-correlation among economic predictors

| CORRELATION | MONEY LAUNDERING | INFLATION | N. P. LOAN | POVERTY | IMPORT | EXPORT | DIRECT INVESTMENT |
|---|---|---|---|---|---|---|---|
| MONEY LAUNDERING | 1 | | | | | | |
| INFLATION | 0.46 | 1 | | | | | |
| N. P. LOAN | -0.10 | 0.02 | 1 | | | | |
| POVERTY | 0.42 | 0.30 | -0.09 | 1 | | | |
| IMPORT | -0.17 | -0.11 | 0.03 | -0.09 | 1 | | |
| EXPORT | -0.22 | -0.21 | -0.01 | -0.20 | 0.93 | 1 | |
| DIRECT INVESTMENT | 0.02 | -0.11 | -0.21 | -0.16 | -0.05 | 0.0108 | 1 |

Table 6- correlation among social predictors

| CORRELATION | CONFLICT RATE | PRESS FREEDOM | MIGRATION | WOMEN IN PARLIAMENT | WOMEN IN LABORFORCE | RULE OF LAW |
|---|---|---|---|---|---|---|
| CONFLICT RATE | 1 | | | | | |
| PRESS FREEDOM | 0.74 | 1 | | | | |
| MIGRATION | -0.45 | 0.30 | 1 | | | |
| WOMEN IN PARLIAMENT | -0.26 | 0.29 | 0.02 | 1 | | |
| WOMEN IN LABORFORCE | -0.15 | 0.23 | 0.13 | 0.11 | 1 | |
| RULE OF LAW | -0.74 | 0.62 | 0.38 | 0.23 | 0.11 | 1 |

Table 7- correlation among personal predictors

| CORRELATION | EDUCATION | RELIGION | AGE |
|---|---|---|---|
| EDUCATION | 1 | | |
| RELIGIOUS | -0.01 | 1 | |
| AGE | 0.83 | -0.74 | 1 |

Table 8- selected economic predictors (multiple regression output)

| PREDICTORS | T stat | TEST | COEFFICIENT(β) |
|---|---|---|---|
| MONEY LAUNDERING | -3.56 | \|t stat\| > t critical | -5.55 |
| INFLATION | -3.92 | \|t stat\| > t critical | -1.55 |
| NON PERFORMING LOAN | -3.94 | \|t stat\| > t critical | -0.97 |
| POVERTY | -3.21 | \|t stat\| > t critical | -0.33 |
| R SQUARE | 0.57 | | |
| INTERCEPT | 101.49 | | |

Table 9-economic predictors' P value in multiple regressions

| VARIABLES | P-VALUE |
|---|---|
| MONEY LAUNDERING | 0.0006262 |
| POVERTY | 0.0019032 |
| NON PERFORMING LOAN | 0.0001704 |
| INFLATION | 0.0001854 |

Table 10-selected social predictors (multiple regression output)

| PREDICTORS | T stat | TEST | COEFFICIENT(β) |
|---|---|---|---|
| CONFLICT RATE | -5.94 | \|t stat\| > t critical | -24.18 |
| PRESS FREEDOM | 2.20 | \|t stat\| > t critical | 0.29 |
| MIGRATION | 2.51 | \|t stat\| > t critical | 0.00 |
| R SQUARE | 0.59 | | |
| INTERCEPT | 73.92 | | |

Table 11- social predictors' P value in multiple regressions

| VARIABLES | P-VALUE |
|---|---|
| PRESS FREEDOM | 0.03073494 |
| CONFLICT RATE | 6.48858E-08 |
| MIGRATION | 0.014170927 |

Table 12- selected personal predictors (multiple regressions output)

| PREDICTORS | t STAT | TEST | COEFFICIENT(β) |
|---|---|---|---|
| EDUCATION | 4.83 | \|t stat\| > t critical | 74.43 |
| RELIGION | -2.03 | \|t stat\| > t critical | -16.56 |
| R SQUARE | 0.51 | | |
| INTERCEPT | 7.57 | | |

Table 13- personal predictors' P value in multiple regressions

| VARIABLES | P-VALUE |
|---|---|
| RELIGION | 0.045970135 |
| EDUCATION | 6.07604E-06 |

Table 14- compounding predictors (regressions output)

| PREDICTORS | T stat | TEST | COEFFICIENT(β) |
|---|---|---|---|
| PRESS FREEDOM | 1.88 | \|t stat\| > t critical | 0.22 |
| CONFLICT RATE | -4.14 | \|t stat\| > t critical | -15.54 |
| MONEY LAUNDERING | -1.99 | \|t stat\| > t critical | -2.73 |
| RELIGION | -2.42 | \|t stat\| > t critical | -13.37 |
| NON PERFORMING LOAN | -3.33 | \|t stat\| > t critical | -0.67 |
| POVERTY | -2.19 | \|t stat\| > t critical | -0.2 |
| MIGRATION | 2.23 | \|t stat\| > t critical | 3.50E-06 |
| R SQUARE | 0.73 | | |
| INTERCEPT | 95.30 | | |

Table 15- comparison of coefficients in three models

| PREDICTORS | COEFFICIENT IN SIMPLE REGRESSION MODEL | COEFFICIENT IN MULTIPLE REGRESSION MODEL | COEFFICIENT IN COMPOUNDING REGRESSION MODEL |
|---|---|---|---|
| PRESS FREEDOM | 0.88 | 0.29 | 0.22 |
| CONFLICT RATE | -31.96 | -24.18 | -15.54 |
| MONEY LAUNDERING | -9.87 | -5.55 | -2.73 |
| RELIGION | -45.26 | -16.56 | -13.37 |
| NON PERFORMING LOAN | -0.8 | **-0.97** | -0.67 |
| POVERTY | -0.6 | -0.33 | -0.2 |
| MIGRATION | 9.30E-06 | 4.63E-06 | 3.50E-06 |

Table 16- compounding predictors' P value

| VARIABLES | P-VALUE |
|---|---|
| PRESS FREEDOM | 0.064447002 |
| CONFLICT RATE | 8.50717E-05 |
| MONEY LAUNDERING | 0.049524921 |
| RELIGION | 0.017951203 |
| NON PERFORMING LOAN | 0.001335519 |
| POVERTY | 0.03125824 |
| MIGRATION | 0.028277913 |