



Journal of Business, Economics and Finance

Year: 2015 Volume: 4 Issue: 1

ISSN 2146-7943

contact@pressacademia.org

PressAcademia publishes journals, books and case studies and organizes international conferences.

<http://www.pressacademia.org/jbef>

CONTENT

Title and Author/s	Page
Statistical Analysis For Impacts Of Economical Conditions on Housing Markets: An Example on Fragile 5 Countries <i>Ali Hepsen, Olgun Aydın, Orhan Vatandas.....</i> DOI: 10.17261/Pressacademia.201519884	1 - 23
Supplier Evaluation System Generation: A Case Of an Automotivespare-Parts Supplier <i>Bengü Sevil Oflac.....</i> DOI: 10.17261/Pressacademia.201519948	24 - 37
Purchasing Power Parity (PPP) Between China And The U.S.: An Empirical Comparative Case Study <i>Murat Gidis, Fatih Mangir, Hasan Murat Ertugrul, Bansi Sawhney.....</i> DOI: 10.17261/Pressacademia.201519949	38 - 51
Competitive Conditions in the Turkish Banking Systems <i>Taner Sekmen, Omer Akkus, Ilyas Siklar.....</i> DOI: 10.17261/Pressacademia.201519950	52 - 68
To Discussion of Post-Crisis Drivers of Georgia's Economic Growth <i>Tatiana Papiashvili, Ilyas Ciloglu.....</i> DOI: 10.17261/Pressacademia.201519951	69 - 80
EKC Hypothesis and the Effect Of Innovation: A Panel Data Analysis <i>Billur Engin Balin, H. Dilara Mumcu Akan.....</i> DOI: 10.17261/Pressacademia.201519952	81 - 91
Entrepreneurial Orientation, Strategic Improvisation, Talent Management And Firm Performance <i>Hartini Ahmad, Darwina Arshad, Leonis Marchalina.....</i> DOI: 10.17261/Pressacademia.201519953	92 - 107
The Effect of Macro Economic Variables on Foreign Portfolio Investments: An Implication for Turkey <i>Aynur Pala, Bilgin Orhan Orgun.....</i> DOI: 10.17261/Pressacademia.201519962	108 - 125

The Critical Role of Brand Love in Clothing Brands

Merve Ülkü Turgut, Beyza Gültekin..... **126 - 151**
DOI: 10.17261/Pressacademia.201519963

The Role of Organizational Resources and Market Competitiveness in Innovativeness

Arzu Karaman Akgül , Sıtkı Gözülü..... **152 - 165**
DOI:



STATISTICAL ANALYSIS FOR IMPACTS OF ECONOMICAL CONDITIONS ON HOUSING MARKETS: AN EXAMPLE ON FRAGILE 5 COUNTRIES

DOI: [10.17261/Pressacademia.201519884](https://doi.org/10.17261/Pressacademia.201519884)

Ali HEPSEN¹, Olgun AYDIN², Orhan VATANDAS³

¹Istanbul University, Turkey

²Mimar Sinan University, Turkey

³REIDIN, Turkey

Keywords:

Fragile five countries;
Housing market;
Macroeconomic indicators;
Krigingmetamodelling

ABSTRACT

In the year 2013, Morgan Stanley declared the Brazilian real, the Indian rupee, the Indonesian rupiah, the South African rand and the Turkish lira as the "Fragile Five," or the troubled emerging market currencies under the most pressure against the U.S. dollar. For those countries, housing market has been a key driver of growth and has been a steady and robust performer since the year 2000. The main purpose of this study is to investigate, modeling whether there is a long-run relationship between macroeconomic indicators and housing markets in Fragile Five countries by correlation analysis, regression, krigingmetamodelling for the twelve year period from 2002 to 2013. The findings of this paper would help government and property investors for creating more effective property management strategies in these countries.

JEL Classification:

E30, E44, L74, R10, R20, R30

1. INTRODUCTION

An emerging market is a country that has some characteristics of a developed market but is not yet a developed market. This includes countries that may be developed markets in the future or were in the past. It may be a nation with social or business activity in the process of rapid growth and industrialization. The four largest emerging and developing economies by gross domestic product (GDP) are the BRIC countries (Brazil, Russia, India and China); the next four largest markets are MIKT (Mexico, Indonesia, South Korea and Turkey) and finally there is a new terminology named Fragile 5 (Brazil, India, Indonesia, Turkey and South Africa) in the emerging market.

According to the International Monetary Fund (IMF), there are 25 countries classified as emerging market economies. They exhibit varying levels of economic growth, inflation, trade and fiscal conditions. Ten years ago, Goldman Sachs declared Brazil, Russia, India and China (BRIC) as the emerging markets with the brightest economic growth prospects.

In the year 2013, Morgan Stanley declared the Brazilian real, the Indian rupee, the Indonesian rupiah, the South African rand and the Turkish lira as the "Fragile Five," or the troubled emerging market currencies under the most pressure against the U.S. dollar. According to Morgan Stanley's report these countries have important things in common—high inflation, weakening growth, large external, and high dependence on fixed income inflows leave these currencies vulnerable. The risks associated with these particular five currencies are also evident from the fact that central banks in these countries have been among the most aggressive in their bid to support their currencies.

The main purpose of this study is to investigate, modelling whether there is a long-run relationship between macroeconomic indicators and housing markets in Fragile 5 countries by impulse/ response analysis, variance decomposition, correlation analysis, regression, krigingmetamodelling for the twelve year period from 2002 to 2013.

The following section provides overview of fragile five countries and selected macroeconomic parameters. Section five and six explain the theoretical framework adopted in this study and the results. The final section is the conclusion.

2. LITERATURE REVIEW

Ghysels (2012) studied the evidence of predictability in US residential and commercial real estate markets. First, they highlight the main methodologies used in the construction of real estate indices, their underlying assumptions and their impact on the stochastic properties of the resultant series. Then survey the key empirical findings in the academic literature, including short-run persistence and long-run reversals in the log changes of real estate prices. Next, they summarize the ability of local as well as aggregate variables to forecast real estate returns. They illustrate a number of these results by relying on six aggregate indexes of the prices of unsecuritized (residential and commercial) real estate and REITs. The effect of leverage and monetary policy is also discussed.

Seth (2011) examined residential investments signals an impending decline in economic activity. Sources of demand for both residential and commercial real estate sectors are similar and this should move the markets in the same direction over the long-run. Since the residential market has already collapsed, the study of real estate investments is important. This paper utilizes real estate and macroeconomic data to forecast investment loans. Cointegration methods are used for the forecast because the data displays a tendency to move together. The results show that the forecast is inconsistent with the positive relationship between both real estate markets; the residential market will continue to decline, whereas the commercial market will see a positive growth from 2011-2012.

Guo (2012) analyzed monthly averaged prices of commercial residential building in Changsha City from Jan, 2002 to Dec, 2011, this paper construct a forecasting model to predict short-term housing price trend and affords reference to homebuyer and investors, what's more, affords technical support to government's policy making. Selected rational forecasting model is discussed, and then a price forecasting ARMA model is constructed.

Emara (2014) examined the impact of liberal policies on the economic performance of labor and capital productivity in the Middle East and North African (MENA) countries, by using nonlinear panel least squares regression with regional dummies and period fixed effects (LSDV) for a sample of 18 MENA countries over the period 1995-2009. He estimated the impact of different aspects of economic freedom on labor and capital productivity. Saljoughian et al. (2013) evaluated the performance of OECD countries and identified the most critical science and technology factors in these countries by using the indicators of science and technology progress suggested by World Bank and exploiting Data Envelopment Analysis (DEA). They measured the efficiency of these countries. They ranked the countries and performed the sensitivity analyses of the factors by Norm-2 method in order to identify the most important factors.

Öztürk, Sözdemir and Ülger (2013) examined growth rates (GDP) in developed and developing countries that is implement of inflation targeting strategy show how a change in the period before and after the crisis (2005-2011). They took into account the inflation performance of those countries for the same period. They compared growth and inflation performances of the countries by means of table and graphical form.

3. SELECTED MACROECONOMIC PARAMETERS AND FRAGILE FIVE COUNTRIES

3.1. Selected Macroeconomic Parameters

Our paper comprises dependent and independent variables: while dependent variable of analyze is residential property price index (RPPI); the independent variables are gross domestic product, current account balance, general government gross debt, general government revenue, gross national savings, inflation (average consumer prices), population, total investment, unemployment rate, real interest rate, volume of exports of goods and services, volume of imports of goods and services. The objective of the residential property price index (RPPI) is to provide an accurate measure of the contemporary rate of change in the prices of the properties. There are a lot of individuals or organizations use residential property prices indices directly or indirectly either to influence practical decision making and conduct of economic policy. Analysts, policymakers, investors and financial institutions follow trends in house prices to expand their understanding of real estate and credit market conditions as well as their impact on economic activity, and financial stability and soundness. For instance, mortgage lenders use this information to gauge default risk and central banks often rely on movements' in house price indices to track households borrowing capacity and aggregate consumption.

Gross Domestic Product represents the economic health of a country. It presents a sum of a country's production which consists of all purchases of goods and services produced by a country and services used by individuals, firms, foreigners and the governing bodies. GDP consists of consumer spending, investment expenditure, government spending and net exports hence it portrays an all-inclusive picture of an economy because of which it provides an insight to investors which highlights the trend of the economy by comparing GDP levels as an index. GDP is not only used as an indicator for most governments and economic decision-makers for planning and policy formulation; but also it helps the investors to manage their portfolios by providing them with guidance about the state of the economy.

On the other hand, it is good measure for an economy and with improvement in research and quality of data, statisticians and governments are trying to find out measures to strengthen GDP and make it a comprehensive indicator of national income. International standards regarding the compilation of balance of payments statistics are described in the fifth edition of the Balance of Payments Manual prepared by the International Monetary Fund (IMF) in order to provide guidance to member countries. In a general sense, the balance of payments is a statistical statement that systematically records all the economic transactions between residents of a country (Central Government, monetary authority, banks, other sector) and nonresidents for a specific time period. The balance of payments statistics are classified under two major groups: "Current Account" and "Capital and Financial Account". In summary, the current account covers all transactions that involve real sources (including volume of exports and imports of goods and services,) and current transfers; the capital and financial accounts show how these transactions are financed (by means of capital transfer or investment in financial instruments). As mentioned in the European Economic series, current account deficits and surpluses are not necessarily macroeconomic imbalances in the sense of developments which are adversely affecting, or have the potential to affect the proper functioning of economies, of the monetary union, or on a wider scale. Deficits and surpluses are a natural consequence of economic interactions between countries. They show to which extent a country relies on borrowing from the rest of the world or how much of its resources it lends abroad. In this way, external borrowing and lending allows countries to trade consumption over time: a country with a current account surplus transfers consumption from today to tomorrow by investing abroad. In turn, a country with a current account deficit can increase its consumption or investment today but must transfer future income abroad to redeem its external debt. Deficits and surpluses can thus simply be the result of an appropriate allocation of savings, taking into account different investment opportunities across countries. Differences in economic prospects lead to differences in saving behavior, with brighter expectations reducing the tendency of economic agents to save and hence contributing to the accumulation of deficits. In particular, countries with a rapidly ageing population may find it opportune to save today (i.e. run surpluses) to smooth consumption over time. On the other hand, current account deficits and surpluses are part of the adjustment process in a monetary union. They absorb asymmetric shocks in the absence of independent monetary policy and nominal exchange rate adjustment. In determining the economic position of a country is through a comparison of general government gross debt, revenue, total expenditure, national savings and total investments to the gross domestic product of the country. For instance, a low government gross debt to GDP percentage is usually an indication of economic health, while a high debt to GDP percentage can indicate financial trouble for a country.

This paper also attempts to analyze the correlation that exists between RPPI and inflation plus real interest rates. Inflation refers the rate at which the general level of prices for goods and services is rising, and, subsequently, purchasing power is falling. On the other hand, the real interest rate is the rate of interest an investor expects to receive after allowing for inflation. It can be described more formally by the Fisher equation, which states that the real interest rate is approximately the nominal interest rate minus the inflation rate.

3.2. Brief Information For Fragile Five Countries

As mentioned, Morgan Stanley declared Brazil, India, Indonesia, South Africa and Turkey as the "Fragile Five" countries in the year 2013 due to their vulnerable economies. The first country among them is Brazil. Brazil is recovering gradually from the growth slowdown that started in mid-2011, but the recovery remains uneven and inflation elevated.

Output is estimated at potential with supply-side constraints, linked to tight labor market conditions and protracted weak investment since 2011, limiting near term growth. Excessive fine tuning of fiscal policy (including through public banks) has weakened the credibility of Brazil's long-standing fiscal framework, while broader policy uncertainty has weighed on investment. On the other hand, global financial conditions and commodity prices may directly affect Brazilian GDP growth rate for the following years (IMF Brazil Country Report 2013).

The tightening of global liquidity has increased external pressures and heightened the focus on India's macroeconomic imbalances (high inflation, large current account and fiscal deficits) and structural weaknesses (particularly supply bottlenecks in infrastructure, power and mining). Growth is expected to slow to 5.4% in the year 2014, reflecting global developments and domestic supply constraints. The current account deficit is narrowing, driven by a significant improvement in exports, robust remittances flows, and a rapid diminution of gold imports. High and persistent inflation is a key macroeconomic challenge facing India. If external pressures from global financial market volatility resume, Indian rupee flexibility should be the first line of defense, complimented by use of reserves, increases in short-term interest rates, actions on the fiscal front, and further easing of constraints on capital inflows (IMF, India Country Report 2013).

A slowdown in growth in major emerging market economies (EMEs) and decline in commodity prices, and more recently, a reversal in push factors tied to a prospective exit from extraordinarily easy global monetary conditions, has put pressure on Indonesia's balance of payments and heightened its vulnerability to shocks. Domestic policy accommodation and rising energy subsidies have also given rise to increased external and fiscal imbalances. Recent policy tightening, fuel price hikes, and exchange rate flexibility have been firmly aimed at reducing these pressures. Growth is projected to slow to 5.36% in 2014. Inflation will likely peak at just below 10% at end 2014, due mainly to the one-off effect of June 2013 fuel price increases and rupiah depreciation. The current account deficit is expected to exceed 3 percent of GDP in 2014 on weak commodity exports. Reserves have also come under pressure, partly due to Bank Indonesia's heavy intervention in the foreign exchange market in mid-2013. Recent market volatility and reserve losses highlight the need to deal decisively with macroeconomic imbalances and contain financial stability risks (IMF Indonesia Country Report 2013).

South Africa has made impressive strides in economic development over the past two decades. But in recent years, lower growth has exacerbated high unemployment, inequality, and vulnerabilities. Although weak trading partner growth contributed, domestic factors were an important reason why South Africa's growth has been below that of other emerging markets.

Large current account and fiscal deficits, so far easily financed by global liquidity, have raised vulnerabilities (IMF, South Africa Country Report 2013).

Finally, Turkey has a stronger domestic demand, with the current account deficit is widening again from a high level, and inflation remains well above target (7.6%). Increasing national savings and improving competitiveness are central to addressing vulnerabilities. On the other hand, economic growth lost momentum in the course of 2013, as capital market tensions pushed interest rates up. Credit and private demand decelerated. Export growth fell, notably due to rapidly declining gold sales. Political tensions have dented confidence, provoking capital outflows and forcing the central bank to raise interest rates sharply in early 2014. Growth is projected to remain subdued through mid-2015, while the current account deficit will remain very high. Sustaining domestic and international confidence is crucial. Monetary, fiscal and financial policies should remain prudent. Improving fiscal transparency with timely general government accounts and comprehensive reporting on the activities of quasi-fiscal institutions is recommended. Disinflation is essential to preserve the bulk of recent competitiveness gains and to allow Turkey to benefit more from the projected recovery in global trade. Increasing the share of foreign direct investment inflows by improving business conditions in the formal sector would help reduce external vulnerability (OECD Economic Outlook 2014).

4. METHODOLOGY

4.1. Correlation Analysis

Correlation is a term that refers to the strength of a relationship between two variables. A strong, or high, correlation means that two or more variables have a strong relationship with each other while a weak, or low, correlation means that the variables are hardly related. Correlation coefficients can range from -1.00 to +1.00. The value of -1.00 represents a perfect negative correlation while a value of +1.00 represents a perfect positive correlation. A value of 0.00 means that there is no relationship between the variables being tested.

The most widely used type of correlation coefficient is the Pearson r , which is also referred to as linear or product-moment correlation. This analysis assumes that the two variables being analyzed are measured on at least interval scales. The coefficient is calculated by taking the covariance of the two variables and dividing it by the product of their standard deviations (StatSoft: Electronic Statistics Textbook 2011).

4.2. Regression analysis

Regression analysis is a conceptually simple method for investigating functional relationships among variables. A real estate appraiser may wish to relate the sale price of a home from selected physical characteristics of the building and taxes (local, school, county) paid on the building. To examine whether cigarette consumption is related to various socioeconomic and demographic variables such as age, education, income, and price of cigarettes.

The relationship is expressed in the form of an equation or a model connecting the response or dependent variable and one or more explanatory or predictor variables.

In the cigarette consumption example, the response variable is cigarette consumption (measured by the number of packs of cigarette sold in a given state on a per capita basis during a given year) and the explanatory or predictor variables are the various socioeconomic and demographic variables. In the real estate appraisal example, the response variable is the price of a home and the explanatory or predictor variables are the characteristics of the building and taxes paid on the building (Chatterjee et al. 2006).

4.3. Kriging Metamodelling

Kriging metamodelling technique that can be mathematically expressed as below:

$$\hat{y} = \hat{\mu} + r' R^{-1} (Y - 1\hat{\mu}) \quad (1)$$

In this equation, \hat{y} is the predicted response value of unknown x (infill sampling point) and $\hat{\mu}$ is the mean of stochastic process. Y is the response value of a design point. The correlation matrix R gives the correlation between all of design points. The correlation vector r gives the correlation between infill sampling point and design points.

$$R = \exp \left[- \sum_{h=1}^k \theta_h |x_h^{(i)} - x_h^{(j)}|^{p_h} \right], \quad \theta_h \geq 0, \quad p_h \in [1, 2]$$

$$(2) \quad r_i = \exp \left[- \sum_{h=1}^k \theta_h |x_h - x_h^{(i)}|^2 \right], \quad \theta_h \geq 0 \quad (3)$$

Maximum Likelihood Estimation is used for predicting θ parameters. Assuming Y has a normal distribution, likelihood function (L) can be written as follows

$$L = \frac{1}{(2\pi)^{\frac{n}{2}} (\sigma^2)^{\frac{n}{2}} |R|^{\frac{1}{2}}} \exp \left[- \frac{(y - 1\beta)' R^{-1} (y - 1\beta)}{2\sigma^2} \right] \quad (4)$$

After obtaining θ parameters which maximize likelihood function, kriging model must be validated. For this purpose well known Cross-validation method is used for validation. In this method, a prediction is generated with one data point excluded from the data set. Then check whether that data point falls within a certain confidence interval for the prediction. If the test fails, appropriate transformations such as log or inverse may be applied to the response values (Jones, et. al, 1998; Schonlau 1997).

5. RESULTS

In this section, detailed result tables by countries are shown.

5.1. Results for Brazil

Table 1: Descriptive statistics for indicators of Brazil

Indicators	Mean
GDP Growth Rate (%)	3.44624
Total investment (% of GDP)	17.88992
Gross national savings (% of GDP)	17.08867
Inflation (%)	6.5255
Volume of imports of goods and services (% of GDP)	8.29467
Volume of exports of goods and services (% of GDP)	5.30075
Unemployment rate (%)	8.67767
Population (Mio)	188.07100
General government revenue (% of GDP)	35.50233
General government gross debt (% of GDP)	68.37592
Current account balance (% of GDP)	-0.80108
Real interest rate (%)	36.97592
Residential Property Price Index (RPPI)	251.59578

There are descriptive statistics of Indicators for Brazil on Table 1. Real Interest Rate Average seems so high for time interval from 2002 to 2013. For the same time interval, average GDP growth rate seems not high. Another important average values from the table for General government gross debt. It is 0.68 of GDP for the same time interval.

Referring to Table 2, there are statistically significant, strong relationship between real interest rate, current account balance, general government revenue, population and unemployment rate with RPPI. There are negative relationship between current account balance, unemployment rate, and real interest rate with RPPI. When current account balance, unemployment rate, real interest rate increase, RPPI decreases. There are positive relationship between populations, general government revenue with RPPI. When population and general government revenue increase, RPPI increases.

Table 2: Correlation matrix for indicators of Brazil

	GDP Growth Rate (%)	Total investment (% of GDP)	Gross national savings(% of GDP)	Inflation (%; Y-o-Y)	Volume of imports of goods and services (% of GDP)	Volume of exports of goods and services (% of GDP)	Unemp. rate (%)	Populat.	General government revenue (% of GDP)	General government gross debt (% of GDP)	Current account balance (% of GDP)	Real interest rate (%)	Residential Property Price Index (RPPI)
GDP (%)	1	.463	.685(*)	-.373	.921(**)	.412	.052	-.056	.078	-.328	.182	-.041	-.181
Total investment(% of GDP)	.463	1	.371	-.485	.560	-.397	-.678(*)	.664(*)	.715(**)	-.775(**)	-.579(*)	-.610(*)	.531
Gross national savings(% of GDP)	.685(*)	.371	1	-.271	.674(*)	.204	.201	-.143	-.250	-.482	.543	.265	-.390
Inflation(%; Y-o-Y)	-.373	-.485	-.271	1	-.390	.517	.516	-.529	-.401	.665(*)	.201	.462	-.332
Volume of imports of goods and services(% of GDP)	.921(**)	.560	.674(*)	-.390	1	.324	-.190	.219	.251	-.558	.085	-.265	.079
Volume of exports of goods and services(% of GDP)	.412	-.397	.204	.517	.324	1	.589(*)	-.597(*)	-.495	.497	.538	.455	-.464
Unemployment rate (%)	.052	-.678(*)	.201	.516	-.190	.589(*)	1	-.980(**)	-.908(**)	.706(*)	.789(**)	.896(**)	-.954(**)
Population	-.056	.664(*)	-.143	-.529	.219	-.597(*)	-.980(**)	1	.851(**)	-.772(**)	-.726(**)	-.923(**)	.944(**)
General government revenue(% of GDP)	.078	.715(**)	-.250	-.401	.251	-.495	-.908(**)	.851(**)	1	-.561	-.866(**)	-.829(**)	.859(**)
General government gross debt(% of GDP)	-.328	-.775(**)	-.482	.665(*)	-.558	.497	.706(*)	-.772(**)	-.561	1	.278	.641(*)	-.537
Current account balance(% of GDP)	.182	-.579(*)	.543	.201	.085	.538	.789(**)	-.726(**)	-.866(**)	.278	1	.784(**)	-.822(**)
Real interest rate (%)	-.041	-.610(*)	.265	.462	-.265	.455	.896(**)	-.923(**)	-.829(**)	.641(*)	.784(**)	1	-.912(**)
Residential Property Price Index (RPPI)	-.181	.531	-.390	-.332	.079	-.464	-.954(**)	.944(**)	.859(**)	-.537	-.822(**)	-.912(**)	1

* Correlation is significant at the 0.05 level (2-tailed).

** Correlation is significant at the 0.01 level (2-tailed)

Table 3: Regression model summary

R	R Square	Adjusted R Square	Std. Error of the Estimate
.992(b)	.985	.982	.07733

- a Predictors: (Constant), Population
 b Predictors: (Constant), Population, Current account balance
 c Dependent Variable: lnRPPI

Table 4: ANOVA Table for Regression Model

	Sum of Squares	df	Mean Square	F	Sig.
Regression	3.518	2	1.759	294.192	.000(b)
Residual	.054	9	.006		
Total	3.572	11			

- a Predictors: (Constant), Population
 b Predictors: (Constant), Population, Current account balance
 c Dependent Variable: lnRPPI

Table 5: Coefficients for Regression Model

	b _i	Std. Error	t	Sig.
(Constant)	-7.456	.877	-8.497	.000
Population	.068	.005	14.404	.000
Current account balance	-.056	.019	-2.975	.016

- a Dependent Variable: lnRPPI

According to the Table 3, 4 and 5, there is a statistically significant stepwise regression model with 0.982 R²_{adj}. Population and current account balance variables explain lnRPPI well.

The model can be written as follows;

$$\ln RPPI = -7.456 + 0.068 * \text{Population} - 0.056 * \text{CurrentAccountBalance}$$

When current account balance increases, RPPI decreases and when population increases, RPPI increases. Population variable explains RPPI variable better than current account balance variable.

When current account balance increases one percent of GDP, RPPI decreases nearly 5.5%. When population increases one million, RPPI increases nearly 7%.

For researching effects of all economic indicators, kriging model was created. When GDP, total investment, gross national savings, volume of imports of goods and services, population, general government revenue increase and inflation, current account balance, unemployment rate, Volume of exports of goods and services, General government gross debt decrease 5%; RPPI is estimated as 486.5896. RPPI decreases nearly 2.86%.

5.2. Results for Indonesia

There are descriptive statistics of Indicators for Indonesia on Table 6. General government gross debt seems so high for time interval from 2002 to 2013.

Table 6: Descriptive Statistics for Indicators of Indonesia

Indicators	Mean
GDP Growth Rate (%)	5.60385168755854
Total investment (% of GDP)	28.23858
Gross national savings (% of GDP)	29.16525
Inflation (%)	7.5452
Volume of imports of goods and services (% of GDP)	8.37933
Volume of exports of goods and services(% of GDP)	1.88142
Unemployment rate (%)	8.4500
Population (Mio)	229.6501
General government revenue (% of GDP)	18.58817
General government gross debt (% of GDP)	38.91750
Current account balance (% of GDP)	0.92650
Real interest rate (%)	4.72330613293245
Residential Property Price Index (RPPI)	128.50

Referring to Table 10, there are statistically significant, relationship between, Total Investment, Unemployment rate, population, general government gross debt, current account balance with RPPI. While there are negative relationship between current account balance, unemployment rate, general government gross debt with RPPI, there are positive relationship between, total investments, population with RPPI.

Table 7: Regression Model Summary

R	R Square	Adjusted R Square	Std. Error of the Estimate
.984(a)	.969	.965	.02535

a Predictors: (Constant), Population

b Dependent Variable: lnRPPI

Table 8: ANOVA Table for Regression Model

	Sum of Squares	df	Mean Square	F	Sig.
Regression	.198	1	.198	307.745	.000(a)
Residual	.006	10	.001		
Total	.204	11			

a Predictors: (Constant), Population

b Dependent Variable: lnRPPI

Table 9: Coefficients for Regression Model

	b _i	Std. Error	t	Sig.
(Constant)	2.221	.150	14.812	.000
Population	.011	.001	17.543	.000

a Dependent Variable: lnRPP

Table 10: Correlation Matrix for Indicators of Indonesia

	GDP Growth Rate (%)	Total investment (% of GDP)	Gross national savings (% of GDP)	Inflation (%; Y-o-Y)	Volume of imports of goods and services (% of GDP)	Volume of exports of goods and services (% of GDP)	Unemployment rate (%)	Populat.	General government revenue (% of GDP)	General government gross debt (% of GDP)	Current account balance (% of GDP)	Real interest rate (%)	Residential Property Price Index (RPPi)
GDP (%)	1	0.539	0.319	-0.293	0.567	0.157	-0.432	.657(*)	0.186	-0.729(**)	-0.645(*)	-0.537	.607(*)
Total investment (% of GDP)	0.539	1	.892(**)	-0.688(*)	0.098	0.343	-0.875(**)	.950(**)	-0.469	-0.868(**)	-0.790(**)	-0.032	.895(**)
Gross national savings (% of GDP)	0.319	.892(**)	1	-0.683(*)	-0.053	0.399	-0.794(**)	.763(**)	-0.638(*)	-0.739(**)	-0.427	0.122	.657(*)
Inflation (%; Y-o-Y)	-0.293	-0.688(*)	-0.683(*)	1	-0.103	0.062	.673(*)	-0.583(*)	.601(*)	0.502	0.45	-0.229	-0.503
Volume of imports of goods and services (% of GDP)	0.567	0.098	-0.053	-0.103	1	0.17	-0.005	0.089	0.241	-0.136	-0.268	-0.464	0.01
Volume of exports of goods and services (% of GDP)	0.157	0.343	0.399	0.062	0.17	1	-0.057	0.295	-0.357	-0.387	-0.145	-0.234	0.237
Unemployment rate (%)	-0.432	-0.875(**)	-0.794(**)	.673(*)	-0.005	-0.057	1	-0.855(**)	0.537	.697(*)	.672(*)	-0.224	-0.809(**)
Population	.657(*)	.950(**)	.763(**)	-0.583(*)	0.089	0.295	-0.855(**)	1	-0.325	-0.937(**)	-0.864(**)	-0.179	.974(**)
General government revenue (% of GDP)	0.186	-0.469	-0.638(*)	.601(*)	0.241	-0.357	0.537	-0.325	1	0.192	0.072	-0.664(*)	-0.267
General government gross debt (% of GDP)	-0.729(**)	-0.868(**)	-0.739(**)	0.502	-0.136	-0.387	.697(*)	-0.937(**)	0.192	1	.734(**)	0.421	-0.871(**)
Current account balance (% of GDP)	-0.645(*)	-0.790(**)	-0.427	0.45	-0.268	-0.145	.672(*)	-0.864(**)	0.072	.734(**)	1	0.231	-0.899(**)
Real interest rate (%)	-0.537	-0.032	0.122	-0.229	-0.464	-0.234	-0.224	-0.179	-0.664(*)	0.421	0.231	1	-0.143
Residential Property Price Index (RPPi)	.607(*)	.895(**)	.657(*)	-0.503	0.01	0.237	-0.809(**)	.974(**)	-0.267	-0.871(**)	-0.899(**)	-0.143	1

* Correlation is significant at the 0.05 level (2-tailed).

** Correlation is significant at the 0.01 level (2-tailed).

According to the Table 7, 8 and 9, there is a statistically significant stepwise regression model with 0.965 R²_{adj}. Population explains lnRPPI well.

The model can be written as follows;

$$\ln RPPI = 2.221 + 0.011 * \text{Population}$$

When population increases, RPPI increases. When population increases one million, RPPI increases nearly 1%.

For researching effects of all economic indicators, kriging model was created. When GDP, total investment, gross national savings, volume of imports of goods and services, population, General government revenue increase and inflation, current account balance, unemployment rate, Volume of exports of goods and services, General government gross debt decrease 5%; RPPI is estimated as 164.4999. RPPI decreases nearly 0.09%.

5.3. Results for South Africa

Table 11: Descriptive Statistics for Indicators of South Africa

Indicators	Mean
GDP Growth Rate (%)	1.984981796
Total investment (% of GDP)	19.05316667
Gross national savings (% of GDP)	15.26108333
Inflation (%)	5.907
Volume of imports of goods and services (% of GDP)	6.905666667
Volume of exports of goods and services (% of GDP)	2.426333333
Unemployment rate (%)	24.93475
Population (Mio)	49.2605
General government revenue (% of GDP)	27.5035
General government gross debt (% of GDP)	35.209
Current account balance (% of GDP)	-9.02041667
Real interest rate (%)	4.440973394
Residential Property Price Index (RPPI)	308.4777778

There are descriptive statistics of Indicators for South Africa on Table 11. General government gross debt seems so high for time interval from 2002 to 2013. For the same time interval, average GDP growth rate seems not high.

Referring to Table 12, there are statistically significant, relationship between, total Investment, population, general government revenue, unemployment rate and real interest rate with RPPI.

Table 12. Correlation Matrix for Indicators of South Africa

	GDP Growth Rate (%)	Total investment (% of GDP)	Gross national savings (% of GDP)	Inflation (%; Y-o-Y)	Volume of imports of goods and services (% of GDP)	Volume of exports of goods and services (% of GDP)	Unemployment rate (%)	Populat.	General government revenue (% of GDP)	General government gross debt (% of GDP)	Current account balance (% of GDP)	Real interest rate (%)	Residential Property Price Index (RPPI)
GDP (%)	1	0.073	-0.169	-0.271	.878(**)	.849(**)	-0.056	-0.366	0.015	-0.292	-0.35	0.256	-0.24
Total investment (% of GDP)	0.073	1	-0.3	0.37	-0.172	0.015	-.939(**)	0.525	.914(**)	-0.474	-0.467	-0.125	.715(**)
Gross national savings (% of GDP)	-0.169	-0.3	1	0.164	-0.081	-0.042	0.348	-0.212	-0.411	-0.105	0.344	-0.059	-0.244
Inflation (%; Y-o-Y)	-0.271	0.37	0.164	1	-0.516	-0.306	-0.158	0	0.31	-0.332	-0.158	0.262	0.052
Volume of imports of goods and services (% of GDP)	.878(**)	-0.172	-0.081	-0.516	1	.892(**)	0.182	-0.244	-0.169	0.094	-0.058	0.107	-0.226
Volume of exports of goods and services (% of GDP)	.849(**)	0.015	-0.042	-0.306	.892(**)	1	0.028	-0.024	0.051	0.083	-0.164	-0.022	0.02
Unemployment rate (%)	-0.056	-.939(**)	0.348	-0.158	0.182	0.028	1	-0.538	-.902(**)	0.485	0.406	0.314	-.742(**)
Population	-0.366	0.525	-0.212	0	-0.244	-0.024	-0.538	1	.687(*)	0.406	-0.02	-.634(*)	.957(**)
General government revenue (% of GDP)	0.015	.914(**)	-0.411	0.31	-0.169	0.051	-.902(**)	.687(*)	1	-0.27	-0.475	-0.349	.842(**)
General government gross debt (% of GDP)	-0.292	-0.474	-0.105	-0.332	0.094	0.083	0.485	0.406	-0.27	1	0.421	-0.309	0.14
Current account balance (% of GDP)	-0.35	-0.467	0.344	-0.158	-0.058	-0.164	0.406	-0.02	-0.475	0.421	1	-0.034	-0.186
Real interest rate (%)	0.256	-0.125	-0.059	0.262	0.107	-0.022	0.314	-.634(*)	-0.349	-0.309	-0.034	1	-.611(*)
Residential Property Price Index (RPPI)	-0.24	.715(**)	-0.244	0.052	-0.226	0.02	-.742(**)	.957(**)	.842(**)	0.14	-0.186	-.611(*)	1

* Correlation is significant at the 0.05 level (2-tailed).

** Correlation is significant at the 0.01 level (2-tailed)

Table 13: Regression Model Summary

R	R Square	Adjusted R Square	Std. Error of the Estimate
.991(a)	.981	.977	.05795

a Predictors: (Constant), Population, Unemployment rate

b Dependent Variable: lnRPPI

Table 14: ANOVA Table for Regression Model

	Sum of Squares	df	Mean Square	F	Sig.
Regression	1.575	2	.787	234.444	.000(a)
Residual	.030	9	.003		
Total	1.605	11			

a Predictors: (Constant), Population, Unemployment rate

b Dependent Variable: lnRPPI

Table 15: Coefficients for Regression Model

	b _i	Std. Error	t	Sig.
(Constant)	2.873	.643	4.470	.002
Population	.108	.009	12.502	.000
Unemployment rate	-.100	.012	-8.183	.000

a Dependent Variable: lnRPPI

According to the Table 13, 14 and 15, there is a statistically significant stepwise regression model with 0.977 R²_{adj}. Population and unemployment rate variables explain lnRPPI well.

The model can be written as follows;

$$\ln RPPI = 2.873 + 0.108 * \text{Population} - 0.1 * \text{Unemployment rate}$$

When unemployment rate increases, RPPI decreases and when population increases, RPPI increases. Population variable explains RPPI variable better than unemployment rate variable.

When unemployment rate increases one percent, RPPI decreases nearly 10.5%. When population increases one unit, RPPI increases nearly 11.4%.

For researching effects of all economic indicators, kriging model was created. When GDP, total investment, gross national savings, volume of imports of goods and services, population, general government revenue increase and inflation, current account balance, unemployment rate, Volume of exports of goods and services, General government gross debt decrease 5%; RPPI is estimated as 399.0367. RPPI decreases nearly 7.09%.

Table 16: Correlation Matrix for Indicators of Turkey

	GDP Growth Rate (%)	Total investment (% of GDP)	Gross national savings (% of GDP)	Inflation (%; Y-o-Y)	Volume of imports of goods and services (% of GDP)	Volume of exports of goods and services (% of GDP)	Unemployment rate (%)	Population	General government revenue (% of GDP)	General government gross debt (% of GDP)	Current account balance (% of GDP)	Real interest rate (%)	Residential Property Price Index (RPPI)
GDP (%)	1	0.463	0.273	0.087	.882(**)	.638(*)	-0.53	-0.25	-0.055	0.234	-0.023	-0.014	-0.221
Total investment (% of GDP)	0.463	1	0.091	-0.392	0.181	0.181	-.667(*)	0.383	0.487	-0.553	-0.157	-0.293	0.538
Gross national savings (% of GDP)	0.273	0.091	1	.609	0.377	0.464	-0.349	-.771(**)	-.742(**)	.604(*)	-0.013	0.335	-.583
Inflation (%; Y-o-Y)	0.087	-0.392	.609	1	0.374	0.206	-0.123	-.625	-.722	.810	0.075	0.003	.725
Volume of imports of goods and services (% of GDP)	.882(**)	0.181	0.377	0.374	1	.729(**)	-0.486	-0.454	-0.322	0.498	-0.226	0.152	-0.403
Volume of exports of goods and services (% of GDP)	.638(*)	0.181	0.464	0.206	.729(**)	1	-.590(*)	-0.494	-0.353	0.392	-0.241	0.423	-0.347
Unemployment rate (%)	-0.53	-.667(*)	-0.349	-0.123	-0.486	-.590(*)	1	-0.054	-0.177	0.044	0.178	0.107	-0.211
Population	-0.25	0.383	-.771(**)	-.625	-0.454	-0.494	-0.054	1	.923(**)	-.879(**)	0.089	-.647	.899(**)
General government revenue (% of GDP)	-0.055	0.487	-.742(**)	-.722	-0.322	-0.353	-0.177	.923(**)	1	-.825(**)	0.107	-0.511	.892(**)
General government gross debt (% of GDP)	0.234	-0.553	.604(*)	.810	0.498	0.392	0.044	-.879(**)	-.825(**)	1	0.136	0.463	-.926(**)
Current account balance (% of GDP)	-0.023	-0.157	-0.013	0.075	-0.226	-0.241	0.178	0.089	0.107	0.136	1	-0.264	-0.148
Real interest rate (%)	-0.014	-0.293	0.335	0.003	0.152	0.423	0.107	-.647	-0.511	0.463	-0.264	1	-0.459
Residential Property Price Index (RPPI)	-0.221	0.538	-.583(*)	-.725(**)	-0.403	-0.347	-0.211	.899(**)	.892(**)	-.926(**)	-0.148	-0.459	1

* Correlation is significant at the 0.05 level (2-tailed).

** Correlation is significant at the 0.01 level (2-tailed)

5.3. Results for Turkey

Table 17: Descriptive Statistics for Indicators of Turkey

Indicators	Mean
GDP Growth Rate (%)	3.69883316785921
Total investment (% of GDP)	19.92975
Gross national savings (% of GDP)	14.92167
Inflation (%)	12.81000
Volume of imports of goods and services (% of GDP)	9.53417
Volume of exports of goods and services (% of GDP)	8.45783
Unemployment rate (%)	10.64283
Population (Mio)	70.85392
General government revenue (% of GDP)	32.54708
General government gross debt (% of GDP)	48.33
Current account balance (% of GDP)	-11.26067
Real interest rate (%)	9.05431904210532
Residential Property Price Index (RPPI)	90.97893611111110

There are descriptive statistics of Indicators for Turkey on Table 17. General government revenue seems high for time interval from 2002 to 2013.

Referring to Table 16, there are statistically significant, relationship between population, general government revenue, and general government gross debt with RPPI. While there is negative relationship between general government gross debt with RPPI, there are positive relationship between population, general government revenue with RPPI.

Table 18: Regression Model Summary

R	R Square	Adjusted R Square	Std. Error of the Estimate
.971(a)	.942	.930	.05502

a Predictors: (Constant), General government gross debt, General government revenue

b Dependent Variable: lnRPPI

Table 19: ANOVA Table for Regression Model

	Sum of Squares	df	Mean Square	F	Sig.
Regression	.446	2	.223	73.621	.000(a)
Residual	.027	9	.003		
Total	.473	11			

a Predictors: (Constant), General government gross debt, General government revenue

b Dependent Variable: lnRPPI

Table 20: Coefficients for Regression Model

		b _i	Std. Error	t	Sig.
(Constant)		3.891	.593	6.561	.000
General government gross debt	government	-.011	.002	-4.825	.001
General government revenue	government	.035	.015	2.304	.047

a Dependent Variable: lnRPPI

According to the Table 18, 19 and 20, there is a statistically significant stepwise regression model with 0.93 R²_{adj}. General government gross debt and General government revenue variables explain lnRPPI well.

The model can be written as follows;

$$\ln RPPI = 3.891 - 0.011 * \text{General government gross debt} + 0.035 * \text{General government revenue}$$

When General government gross debt increases, RPPI decreases and when General government revenue increases, RPPI increases. General government revenue variable explains RPPI variable better than General government gross debt. When General government gross debt increases one percent of GDP, RPPI decreases nearly 1%. When General government revenue increases one unit, RPPI increases nearly 3.6%.

For researching effects of all economic indicators, kriging model was created. When GDP, total investment, gross national savings, volume of imports of goods and services, population, general government revenue increase and inflation, current account balance, unemployment rate, volume of exports of goods and services, general government gross debt decrease 5%; RPPI is estimated as 117.5026. RPPI decreases nearly 6.34%.

6. CONCLUSION

For Brazil, there are statistically significant, strong relationship between real interest rate, current account balance, general government revenue, population and unemployment rate with RPPI. There are negative relationship between current account balance, unemployment rate, and real interest rate with RPPI. When current account balance, unemployment rate, real interest rate increase, RPPI decreases. There are positive relationship between populations, general government revenue with RPPI. Population variable explains RPPI variable better than current account balance variable. When current account balance increases one percent of GDP, RPPI decreases nearly 5.5%. When population increases one million, RPPI increases nearly 7%. For researching effects of all economic indicators, kriging model was created.

When GDP, total investment, gross national savings, volume of imports of goods and services, population, general government revenue increase and inflation, current account balance, unemployment rate, Volume of exports of goods and services, General government gross debt decrease 5%; RPPI is estimated as 486.5896. RPPI decreases nearly 2.86%.

For Indonesia; there are statistically significant, relationship between, Total Investment, Unemployment rate, population, general government gross debt, current account balance with RPPI. While there are negative relationship between current account balance, unemployment rate, general government gross debt with RPPI, there are positive relationship between, total investments, population with RPPI. When population increases, RPPI increases. When population increases one million, RPPI increases nearly 1%. For researching effects of all economic indicators, kriging model was created. When GDP, total investment, gross national savings, volume of imports of goods and services, population, General government revenue increase and inflation, current account balance, unemployment rate, Volume of exports of goods and services, General government gross debt decrease 5%; RPPI is estimated as 164.4999. RPPI decreases nearly 0.09%.

For South Africa; there are statistically significant, relationship between, Total Investment, population, general government revenue with RPPI. While there are negative relationship between unemployment rate and real interest rate with RPPI. When unemployment rate increases, RPPI decreases and when population increases, RPPI increases. Population variable explains RPPI variable better than unemployment rate variable. When unemployment rate increases one percent, RPPI decreases nearly 10.5%. When population increases one unit, RPPI increases nearly 11.4%. For researching effects of all economic indicators, kriging model was created. When GDP, total investment, gross national savings, volume of imports of goods and services, population, general government revenue increase and inflation, current account balance, unemployment rate, Volume of exports of goods and services, General government gross debt decrease 5%; RPPI is estimated as 399.0367. RPPI decreases nearly 7.09%.

For Turkey; there are statistically significant, relationship between population, general government revenue, and general government gross debt with RPPI. While there is negative relationship between general government gross debt with RPPI, there are positive relationship between population, general government revenue with RPPI. When General government gross debt increases, RPPI decreases and when General government revenue increases, RPPI increases. General government revenue variable explains RPPI variable better than General government gross debt. When General government gross debt increases one percent of GDP, RPPI decreases nearly 1%. When General government revenue increases one unit, RPPI increases nearly 3.6%. For researching effects of all economic indicators, kriging model was created. When GDP, total investment, gross national savings, volume of imports of goods and services, population, general government revenue increase and inflation, current account balance, unemployment rate, volume of exports of goods and services, general government gross debt decrease 5%; RPPI is estimated as 117.5026. RPPI decreases nearly 6.34%.

The paper is the first academic study that investigating, modelling whether there is a long-run relationship between macroeconomic indicators and housing markets in Fragile 5 countries. The findings of this paper would help government and property investors for creating more effective property management strategies in these countries (especially in Brazil and Turkey). On the other hand due to lack of housing market data, statistical models could not be created for India.

ACKNOWLEDGEMENT

REIDIN (Real Estate Investment and Development Information Network-<http://www.reidin.com>) is the world's first global business information service, that is designed to meet the unique requirements of real estate market professionals who are interested in the emerging countries, develops residential property price indices for number of countries including Turkey. We would like to thank REIDIN as their index plays an essential role on this study.

REFERENCES

- Amiri, M. P., Amiri, A. P. and Amiri, M. P. (2012). An analytical network process approach for evaluating banking performance based on balanced scorecard. *Trends in Applied Sciences Research*, 7(6), 456-466.
- Ashourian, M. (2012). Evaluating the Rank of Performance of Countries of the Middle East and North Africa with MADM. *Journal of Informatics and Mathematical Sciences*, 4(3).
- Carree, M. A. & Turik, A. R. (2008). The lag structure of the impact of business ownership on economic performance in OECD countries. *Small Business Economics*, 30, 101-110.
- Chen, S. J., Hwang, C. L. (1992). *Fuzzy multiple attributed decision making: Methods and applications*. Berlin: Springer-Verlag.
- Chen, Y. S., Lin, C. T. and Lu, J. H. (2010). The analytic network process for the banking sector: An approach to evaluate the creditability of emerging industries. *African Journal of Business Management*, 5(4), 1343-1352.
- Emara, N. (2014). Quantitative Evaluation of the Struggle of Economic Performance: The Case of MENA Countries. *Topics in Middle Eastern and African Economies*, 16(2), 184-191.
- Hernández, C. T., Castro, R. C., Marins, F. A. S., Duran, J. A. R., (2012). "Using the Analytic Network Process to Evaluate the Relation between Reverse Logistics and Corporate Performance in Brazilian Companies", *Revista Investigación Operacional*, Vol: 33, No: 1, 13-22

- Hwang, C.L., Yoon, K. (1981). Multiple attribute decision making: Method and application. New York: Springer-Verlag.
- International Monetary Fund (IMF), (2013). IMF, Brazil Country Report, No: 13/312.
- International Monetary Fund (IMF), (2013). IMF, India Country Report, No: 14/57.
- International Monetary Fund (IMF), (2013). IMF, Indonesia Country Report, No: 13/362.
- International Monetary Fund (IMF), (2013). IMF, South Africa Country Report, No: 13/303.
- International Monetary Fund (IMF), (2014), IMF World Economic Outlook Database, (Available online at <http://www.imf.org/external/pubs/ft/weo/2014/01/weodata/index.aspx>)
- Ishizaka, A., Nemery, P., (2013). Multi-Criteria Decision Analysis: Methods and Software. John Wiley & Sons, Ltd, United Kingdom.
- Lai, Y.J., Liu, T.Y. and Hwang, C.L. (1994). TOPSIS for MODM. European Journal of Operational Research, 76, 486-500.
- Morgan Stanley, (2013). FX Pulse Preparing for Volatility, Morgan Stanley Research Paper, <http://www.morganstanleyfa.com/public/projectfiles/dce4d168-15f9-4245-9605-e37e2caf114c.pdf> Accessed 5 June 2014
- Niemira, M. P. & Saaty, T. L. (2004). An Analytic Network Process model for financial-crisis forecasting. International Journal of Forecasting, 20, 573-587.
- Öztürk, S., Sözdemir, A. and Ülger, Ö. (2014). The Effects of Inflation Targeting Strategy on the Growing Performance of Developed and Developing Countries: Evaluation of Pre and Post Stages of Global Financial Crisis. Procedia - Social and Behavioral Sciences, 109, 57-64.
- Reidin.com, (2014). Real Estate Investment and Development Information Network, <http://www.reidin.com> Accessed 1 October 2014).
- Saaty, T. L., (2008). Decision Making With the Analytic Hierarchy Process. Int. J. Services Sciences, 1 (1)

- Saaty, T. L., Vargas L. G., (2001). Models, Methods, Concepts & Applications of the Analytic Hierarchy Process. International Series in Operations Research & Management Science, Kluwer Academic Publishers.
- Saaty, T.L., (1980). The analytic hierarchy process. New York: McGraw-Hill.
- Saaty, T.L., (1990). How to Make Decision: The Analytic Hierarchy Process, European Journal of Operational Research, North Holland, 48, 9-26.
- Saljoughian, M. et al. (2013). Performance Evaluation of OECD Countries by Data Envelopment analysis based on Science and Technology Factors. Journal of Applied Science and Engineering Management, 1(1), 24-35.
- The Organisation for Economic Co-operation and Development (OECD), (2014). Economic Outlook, No: 1.
- Tzeng, G.H. and Huang, J.J. (2011). "Multi Attribute Decision Making: Methods and Applications", CRC Press, ISBN: 978-1-4398-6157-8, USA.
- Ghysels, E. et al (2012) Forecasting Real Estate Prices , Handbook of Economic Forecasting: Vol II, G. Elliott and A. Timmermann (Eds.), Elsevier, forthcoming.
- Seth, J (2011) Forecasting The Real Estate Market: A Cointegrated Approach Master Of Arts Thesis, The Faculty of the Department of Economics University of Houston.
- Guo J. (2012) Housing Price Forecasting based on Stochastic Time Series Model, Int.J.Buss.Mgt.Eco.Res., Vol 3(2), 2012, 498-505
- Box, G. E. P., G. M. Jenkins, and G. C. Reinsel (1994). Time Series Analysis: Forecasting and Control 3rd ed. Englewood Cliffs, NJ: Prentice Hall.
- D. R. Jones, M. Schonlau, and W. J. Welch (1998), Efficient Global Optimization of Expensive Black-Box Functions, Journal of Global Optimization, 13, 455–492
- M. Schonlau (1997), Computer Experiments and Global Optimization, Phd. Thesis, University of Waterloo.
- StatSoft: Electronic Statistics Textbook. (2011).
- Chatterjee, S. and Hadi, A., S., (2006), Regression Analysis by Example Fourth Edition, John Wiley & Sons, Inc, p.1.



SUPPLIER EVALUATION SYSTEM GENERATION: A CASE OF AN AUTOMOTIVE SPARE-PARTS SUPPLIER

DOI: [10.17261/Pressacademia.201519948](https://doi.org/10.17261/Pressacademia.201519948)

Bengü Sevil OFLAC¹

¹Izmir University of Economics, Turkey. E-mail: bengu.sevil@ieu.edu.tr

Keywords:

B2B,
Supplier Scorecard,
Supplier Development,
Assessment Criteria,
Automotive

ABSTRACT

The main aim of this study is to conduct a current state analysis for a leading original and spare parts producer operating in automobile industry. In the focused company, due to having some problems about purchasing process, there was a need for reviewing and restructuring supplier evaluation mechanism. In this perspective, based on the results of qualitative techniques conducted, reasons for poor evaluation systems were found. As a contribution to practice, in line with the needs of company, supplier evaluation and selection criteria were suggested for scorecard assessment. Moreover, detailed rating systems were also formed in order to reach stability and consistency in evaluation. Furthermore, supplier certification classes and possible supplier development strategies were developed.

Jel Classification:

1. INTRODUCTION

Over years purchasing has evolved and turned into a more strategic function which makes up 50-90 % of total costs in industrial companies (Boer et al., 2001). Thus, with this large share, it is obvious that the effective management of purchasing function may result in cost efficiency and may lead to better profitability. Conducting an effective supplier selection, creating innovative supplier development strategies, and having meaningful supplier performance assessment mechanisms are crucial in supplier relationship management (Kannan and Tan, 2002). Supplier development refers to the efforts of a buying company to increase the performance and capabilities of its suppliers in order to meet the buying company's requirements through evaluation, feedback, trainings, or direct investment (Krause and Ellram, 1997). Obviously, selecting the right suppliers, evaluating their performance on a consistent basis and conducting supplier development activities have considerable impacts on forming long-term and value creating B2B relationships (Vonderembse and Tracey, 1999).

Managing the supply base is an important but complex issue for automotive spare parts manufacturers, especially for the small and medium sized ones. Supplying components to the vehicle industry is a hard task due to the need of compliance to high performance and quality demands.

These high levels of performance and quality can be achieved through an effective supplier management process and constant monitoring of supplier performance even for the low level tiers. XN Automotive is an original and spare parts manufacturer that provides 360 products in 9 categories (e.g. locks set, starter switches, switches, fuel tank caps, door handles) to vehicle suppliers.

In this paper, the main aim is to conduct a current state analysis for the purchasing process of an automobile spare parts manufacturer and to suggest more comprehensive scorecard criteria for better evaluation and selection via detailed rating schemes. Furthermore, as for constituting supplier development strategy framework, supplier certification classes are also generated.

2. LITERATURE REVIEW

Crucial importance of supplier relationships has been highlighted by many researchers in industrial marketing and purchasing/supply management literatures (e.g. Choi and Hartley, 1996; Olsen and Ellram, 1997, Cannon and Homburg, 2001; Bruno et al., 2012). In order to have an efficient supply base and a long-term relationship, the practitioners should give importance to supplier selection/evaluation and supplier development strategies. In the literature, supplier selection and evaluation based studies are descriptive (as a description of actual practice) or prescriptive which focuses on methods (e.g. modeling and other quantitative or qualitative techniques) for selection and evaluation (Ellram, 1990). Regarding to prescriptive ones, various methods have been used in the related literature, ranging from basic ones (e.g. linear weighting and categorical methods) to more advanced methods such as statistical and mathematical methods and artificial intelligence (Boer et al., 2000; Sarkar and Mohapatra, 2006). On the other hand, in the descriptive studies, identification of supplier selection and evaluation criteria is one the areas that the researchers put emphasis on (e.g. Ellram, 1990; Swift, 1995; Vonderembse and Tracey, 1999; Thanaraksakul and Phruksaphanrat, 2009). In supplier assessment, different criteria can be used such as price, delivery, quality, management compatibility, personnel training and development, product reliability, attitude and strategic fit, labor relations record, technical capacity and support, after-sales services, information technology and communication systems, financial status, and innovation (Ellram, 1990; Thanaraksakul and Phruksaphanrat, 2009) which are critical to partnership success and performance development. Besides that area, supplier development issues have also received a considerable attention from the academics (Watts and Hahn, 1993; Krause, 1997; Krause and Ellram, 1997). Industry specific purchasing and supplier management studies are also common in the literature (Choi and Hartley, 1996; Lambert et al., 1997; Chan and Chan, 2004) and more specifically automobile industry has been the focus of some supplier studies (Choi and Hartley, 1996; Schmitz and Platts, 2004; Tang, and Qian, 2008).

This study presents a descriptive approach by explaining the practice in automobile industry. Additionally, identification of supplier selection/evaluation criteria (based on the situation, the company may determine on which criterion to use for selection or performance evaluation in on-going relationships), detailed rating systems, certification classes and supplier development strategies are the corner stones of the study.

3. METHODOLOGY AND DATA

In this study, 2 stages were pursued for problem definition and score card generation. In the first stage, semi structured interviews and secondary data analysis were conducted by the researchers in order to conduct the current state analysis and reveal the problems in the purchasing process.

Additionally, these methods assisted the researchers for the second stage in determining the evaluation criteria and developing supplier rating systems. For the second step, a focus group study was employed as an additional technique for forming an interactive environment for criteria and evaluation determination.

Data collection was done between October 2012 and June 2013. For secondary data analysis part, purchasing price list, supplier tracking and evaluation lists, approved and alternative supplier list, purchasing process maps and feasibility forms were examined for conducting current state analysis.

In order to analyze the important aspects in supplier evaluation, nine semi-structured interviews were conducted with different employees/managers from tooling-production, purchasing and import/export departments. Our themes were types/properties of raw materials, purchasing process, supplier evaluation and scorecards. Interviews were recorded and transcribed later by the researchers.

Focus group was composed of Vice Manager, Company's Advisor, Purchasing Department, Import and Export Department, Production Department. Topic was the evaluation criteria (performance indicator), importance rating and detailed measurement of these performance indicators.

3.1. Findings

3.1.1. Problems Defined in Procurement

First problem observed is associated with the supply base. Due to having a limited number of alternative suppliers, XN Company's flexibility is limited. Besides, this situation can create some sourcing risks.

As a second problem, this company employs an ineffective supplier evaluation system. Evaluation criteria and grading parts are causing problems by preventing detailed analysis. "Supplier Performance Monitoring Forms" are being used for recording the names of the firms, prices, order quantities, deadline of orders, delivery performance. However, supplier evaluation criteria are limited to four classes: quality documents, delivery performance, price, information flow. These criteria remain narrow also when it comes to detailed evaluation. No sub-categories are evaluated during the process. Additionally, 3 point- grading scale (0-10-15 points) is being utilized in the scoring part. At the end of the evaluation based on these criteria, the company categorizes its suppliers. Their classification is shown below:

Figure 1: Current Supplier Classification Scheme

Grade	100-85	84-70	69-50	49-0
Type	A	B	C	D
Strategy	Directly Approve d	Tracked Periodicall y	Alternative Supplier	Not evaluated as supplier

Due to having a short list of evaluation criteria, all their suppliers fall in Category A (best category) in performance evaluation. This situation is creating bias in evaluation process.

3.1.2. Supplier Selection and Evaluation Scorecard Generation for the Selected Raw Materials

Scorecards are being used in various industries for evaluation and selection of suppliers. Besides, monitoring the performance via scorecards enables taking corrective action on the suppliers’ side. Scorecards can show the performance evaluation for a certain period of time like a year or a month. Based on the trends and arising needs, it can be updated and new criteria can be added. New suppliers and if needed current supplier have to provide the product related information to the buyer company when it is needed. This can be demanded in the form of Request for Information (RFI).

In scorecards, importance weighting and performance scores are multiplied and evaluated together. While the performance ratings are done with 5-point scales (0-very bad, 4-very good), importance weights for the criteria given by the managers and purchasing staff range from 0 to 1 point. As the total rating a supplier could get a grade between 0 and 4 as total.

As a result of the focus group studies, the category importance weights were determined. The most important category for the company was found to be Quality (with the weight of 0,30). Price and Logistics Capabilities received the same weights (0,20) while the other categories get lower importance rates (Trustability- 0,10, Information Sharing- 0,05, Contract Terms-0,05 and Social- Environmental Responsibility- 0,10).

The suggested criteria for evaluation and selection are explained in detail as below:

Category 1: Quality

- **Quality Certificates:** ISO 9001: 2008 Quality Management Systems and ISO / TS 16949 Automotive - Quality Management Systems and Certification (certificate for being a car manufacturer (OEM) with standard parts supplier) are among the most significant certificates in automotive industry. XN Company has the mentioned certificates.

Moreover, they have the Ford Q1: 2002 Preferred Quality Situation Certificate. Thus, during the selection process, the company evaluates the certificates owned. The most important certificate is ISO 16949 as for being a component supplier in the Company.

- **Rejected parts per million (RPPM):** It measures defective product rate in a shipment. The PPM value is defined as the number of rejected parts divided by the total quantity delivered multiplied by 1 000 000. PPM is calculated on a monthly basis and is one of the important key quality indicators.
- **PPAP Reports:** Production Part Approval Process (PPAP) is a standard process generated by AIAG (Automotive Industry Action Group) which is required from component suppliers for quality planning in automobile industry. PPAP documents involve design records (if the suppliers is responsible of drawing), engineering approval for the part, process flow charts for parts' production, sample reports, quality certificates for testing laboratory, Design Failure mode and Effect Analysis Report (DFMEA), Process Failure Mode and Effect Analysis Report (PFMEA), specification reports, statistical process control reports. Besides, PPAP encompasses Records of Material for all test performed, appearance approval and measurement system analysis records (for critical part characteristics) and Part Submission Warrant (PSW) as a summarizing form of all PPAP records.

Records of Material becomes more important when the semi-finished materials are being purchased. When it comes to raw material manufacturers technical data sharing remains limited. For instance, UV rays can change door handle's color. This is a case of non-conformance and record of material should be submitted to the buyer company. Besides, for Finland markets, door handles should be resistant to freezing and this semi-finished door handles should be exposed to -40 C degrees durability test and the results should be written in the material report.

These sample and process related documents are essential for understanding the level of conformance to the required quality and design specifications and suppliers' production capability. Suppliers are graded based on the documents availability and their level of PPAP application.

- **Corrective action response:** This refers to the correction responsiveness in case of failures. In case of non-conformance XN gives importance to accessibility. Quick response and providing a detailed feedback with 8D report for non-conformance is essential. 8D is the corrective action process that serves as a problem solving tool by involving root analysis of failure, definition of the problem and corrective actions.

Table 1: Detailed assessment rating for quality category

Quality		
Quality Certificates	4	Supplier has ISO 9001: 2008 and ISO / TS 16949
	3	-
	2	Supplier has ISO 9001: 2008
	1	-
	0	Supplier has no certificates
PPAP	4	Part Submission Warrant (PSW) with product samples and complete supporting other PPAP documents available for review at the supplier's manufacturing location.
	3	PSW and other requirements as defined by the customer.
	2	PSW with product samples and complete supporting other PPAP documents
	1	PSW with product samples and limited supporting other PPAP documents
	0	if only PSW is submitted
Rejected Parts Per Million (RPPM)	4	0 PPM
	3	1 - 499 PPM
	2	500 - 999 PPM
	1	1000 - 2500 PPM
	0	> 2500 PPM
Corrective action response	4	Immediate response
	3	Response in 24 hours
	2	Response in 48 hours
	1	Response in 72 hours
	0	> 3 day Response

Category 2: Price

- **Discounts:** If the suppliers provide more than 20 percentage discount to XN Company with the same quality level as the other suppliers provide, that supplier can get the maximum grade. Sometimes the suppliers agree to make price stability agreements for minimum of 3 years rather than providing any discount. In that case, the suppliers get 1 point. Getting discount is important for the company.
- **Relative price:** This is the relative price criterion. Based on the average market price, rating is done for the first prices given by the suppliers (before discounts).

Table 2: Detailed assessment rating for price category

Price		
Relative Market Price	4	>20% lower than the average market price
	3	10 - 20% lower than the average market price
	2	1 % - 10% lower than the average market price
	1	No discount, price stability agreement for minimum 3 years
	0	No cost advantage
Discount Rate (% of price)	4	10 or more discount rates
	3	9 - 6 discount rate
	2	5 - 3 discount rates
	1	2 - 1 discount rate
	0	No discount

Category 3: Logistics capabilities

- **On time delivery:** On-time delivery is calculated based on the tolerance limits. Each shipment can have a tolerance limit (e.g. -2,+2 days) for delivery dates which is decided by the buyer company. Receiving the materials in tolerance zone is crucial due to the prevention of any possible breakdowns deriving from late delivery or additional inventory costs originated from early arrivals.
- **Order accuracy:** Although the company works on arranged cumulative party quantities with its suppliers, incorrect quantities (especially more than the required) can cause extra storage costs for the buyer. Again for the quantities, a tolerance limit is determined.

Category 4: Information sharing

- **Open book policy:** In the scope of cost breakdown analysis, suppliers are expected to share their cost accounts with the buyer company. Open book policy implies the transparency of operations regarding to costs. This can help the players in building trust oriented relationships in B2B environment and better supplier development activities.

Table 3: Detailed assessment rating for logistics capability category

Logistics Capability		
On-time Delivery	4	All shipments on time
	3	1 Time Delay (outside tolerance limits)
	2	2 Times Delay (outside tolerance limits)
	1	3 Times Delay (outside tolerance limits)
	0	> 3 Times Delay (outside tolerance limits)
Order Accuracy	4	All correct quantities (within tolerance)
	3	< 5 % shipments with incorrect quantities (within tolerance)
	2	5-10 % shipments with incorrect quantities (within tolerance)
	1	10-20 % shipments with incorrect quantities (within tolerance)
	0	> %20 of shipments with incorrect quantities (within tolerance)

Table 4: Detailed assessment rating for logistics capability category

Information sharing		
Open book policy acceptance	4	Transperacy in all financial records
	3	-
	2	Conditional acceptance of open book policy
	1	-
	0	No acceptance

Category 5: Trustability

- **References:** References are critical for understanding the reputation and trustability of the supplier company.
- **Financial check:** This involves the data collection from banks, tax offices or chamber of commerce (if the supplier is registered in one of them) on the suppliers' credibility.

- **Business experience:** Experience in the field is a major concern for assessment. This provides evidence for the stability of company and its strength.
- **Duration of relation:** The duration of relationships are vital for trust. Informal relations can emerge over time that may enable extra concessions in relations such as more discounts, and expedited shipments. Hence, the length of the relation should be taken into account .

Criteria Category 6: Contract Terms

- **Term acceptance level:** XN Company’s purchasing agreement includes 50 clauses. Thus, supplier’s term acceptance level should also be assessed in evaluation. Acceptance of the clauses is graded with 4 points.

Table 5: Detailed assessment rating for trustability category

Trustability		
References	4	More than 10 acceptable and well-known customers
	3	5 - 10 acceptable and well-known customers
	2	3 - 5 acceptable and well-known customers
	1	1 - 3 acceptable and well-known customers
	0	No references
Duration of Relation	4	More than 10 years
	3	5 - 9 years
	2	3 - 4 years
	1	1 - 2 years
	0	New Relationship
Business experience	4	More than 30 years
	3	20 - 30 years
	2	10 - 20 years
	1	1 - 10 years
	0	Newly established company
Financial Check	4	High Credibility
	3	-
	2	Average Credibility
	1	-
	0	No Credibility

Table 6: Detailed assessment rating for contract terms category

Contract terms		
Term Acceptance Level in Purchasing Agreement	4	Acceptance
	3	-
	2	Conditional Acceptance
	1	-
	0	No Acceptance

Category 7: Social and environmental responsibility

- **Occupational health and safety:** Working with safety and health orientated suppliers is a main consideration for the company. Having an OHSAS 18001 - Occupational Health and Safety Management System provides privilege to the suppliers in selection and evaluation due to constituting evidence for meeting legal requirements and encompassing several aspects such as risk assessment and emergency¹.
- **Environmental aspects:** ISO 14001 - Environmental Management Systems and Certification is a certificate that assures the measurement and improvement of environmental impact of the company. It involves specific areas such as waste management, energy usage, emissions.² With also the changing regulations in Turkey, environmental concern and necessities are rising day by day. Thus, it is of importance to have the environmental certificate availability rating in supplier assessment.

¹ <http://www.ohsas-18001-occupational-health-and-safety.com/>

² <http://www.iso.org/iso/home/standards/management-standards/iso14000.htm>

Table 7: Detailed assessment rating for social and environmental responsibility category

Social and Environmental responsibility		
Occupational health and safety	4	if the supplier has OHSAS 18001 - Occupational Health and Safety Management System
	3	-
	2	-
	1	-
	0	if the supplier does not have OHSAS 18001 - Occupational Health and Safety Management System
Environmental certificate	4	if the supplier has ISO 14001 - Environmental Management Systems and Certification
	3	-
	2	-
	1	-
	0	if the supplier does not have ISO 14001 - Environmental Management Systems and Certification

3.1.3. Supplier Classification and Strategy Development

Based on the total ratings gathered by suppliers in scorecards and by considering the lowest and highest possible ratings, the proposed supplier certification classes can be defined as follows:

Table 8: Proposed supplier certification classes

Total rating	Certification classes
4-3,5	Platinum
3,49-2,99	Gold
2,98-2,48	Silver
2,47-1,97	Bronze
< 1,96	Not working with those suppliers

Apart from the easiness of monitoring and classifying suppliers, this proposed classification also enables to determine the supplier development strategies for classes. For platinum group suppliers, who are the best performing suppliers, reward systems can be utilized through providing priority in contracts, forming strategic alliances or supporting supplier investments in various areas such as R&D. The aim is to create long-term relationships with the suppliers that fall into this group.

For gold group suppliers, lacking points should be identified from their scorecards and based on the review, trainings can be given on the selected areas for improvement. Gold suppliers commonly stated as good class suppliers that needs improvement in certain areas.

Silver and bronze groups are the ones that involve low performing suppliers. Rather than making any kind of investment, improve or else approach can be implemented. Setting specific goals such as initiating corrective action in a specific time period would be utilized. As improve or else approach suggests, in case of failure, the contracts can be terminated. Through auditing and feedback mechanisms improvements can be achieved in those groups.

4. CONCLUSION

This study is a developed from a part of a senior project which was guided by industry advisors and the author as the academic advisor. By presenting both industry specific criteria in addition to the more commonly used ones, and the detailed rating systems, this study will serve as a guide for developing better supplier evaluation systems in automobile industry. Besides, this study establishes a bridge for industry- university collaboration.

Supplier classification classes are the tools for understanding and grouping the suppliers. Depending on the classes generic supplier development strategies can be generated. Through development, better buyer-supplier relations can be built and long-term relations in B2B environment can be achieved.

Certification classes are being used by most of the companies working with several suppliers. Moreover, if the buyer is a global and powerful brand, the suppliers can take benefit of this certification class. Suppliers may use their classes (if it is a good one) for reputation and assurance to other companies with aim of enlarging their business volumes.

As the limitation, semi-finished parts' supplier assessment was set as out of scope and just evaluation of raw material suppliers were taken into account. Some additional criteria such as innovativeness should be assessed for supplier selection and evaluation when semi-finished parts are being evaluated. In the further studies semi-finished material suppliers' evaluation can be taken as the basis. Moreover, different quantitative techniques can be utilized for company's evaluation system.

Acknowledgement: *The author of this article is the academic advisor of this industry project. This study was developed from a part of a senior project conducted by senior year Logistics Management students at Izmir University of Economics. The project team members that conducted the field research are namely; Zeynep Kaya, Pelin Ayanalp, Burak Kadiođlu, Övgü Ünal, Seden Yeşilfiliz.*

REFERENCES

- Boer L. , Labro E. and Morlacchi P. (2000). A Review of Methods Supporting Supplier Selection, *European Journal of Purchasing & Supply Management*, Vol. 7, 2001, 75-89.
- Cannon, J.P. and Homburg, C. (2001). Buyer-Supplier Relationships and Customer Firm Costs. *Journal of Marketing*: January 2001, Vol. 65, No. 1, pp. 29-43.
- Chan, F. T. S., & Chan, H. K. (2004). Development of the supplier selection model—a case study in the advanced technology industry. *Proceedings of the Institution of Mechanical Engineers, Part B: Journal of Engineering Manufacture*, 218(12), 1807-1824.
- Choi, Thomas Y., and Janet L. Hartley (1996). An exploration of supplier selection practices across the supply chain. *Journal of Operations Management* 14(4): 333-343.
- Ellram, L. M. (1990). The supplier selection decision in strategic partnerships. *Journal of Purchasing & Materials Management*, 26(4), 8.
- Kannan, V. R. and Tan, K. C. (2002), Supplier Selection and Assessment: Their Impact on Business Performance. *Journal of Supply Chain Management*, 38: 11–21.
- Krause, D. R. (1997). Supplier Development: Current Practices and Outcomes. *International Journal of Purchasing and Materials Management*, 33: 12–19.
- Krause, D. R., and Ellram, L. M. (1997). Critical elements of supplier development The buying-firm perspective. *European Journal of Purchasing & Supply Management*, 3(1), 21-31.
- Lambert, D. M., Adams, R. J., & Emmelhainz, M. A. (1997). Supplier Selection Criteria in the Healthcare Industry: A Comparison of Importance and Performance. *International Journal of Purchasing and Materials Management*, 33(4), 16-22.
- Olsen, R. F., and Ellram, L. M. (1997). Buyer-supplier relationships: alternative research approaches. *European Journal of Purchasing & Supply Management*, 3(4), 221-231.
- Ashutosh, S. and Pratap KJ Mohapatra. (2006). Evaluation of supplier capability and performance: A method for supply base reduction. *Journal of Purchasing and Supply Management* 12(3): 148-163.

- Schmitz, J. and Platts, K.W. (2004). Supplier Logistics Performance Measurement: Indications From A Study In The Automotive Industry, *International Journal Of Production Economics*:231- 243.
- Swift, C. O. (1995). Preferences for single sourcing and supplier selection criteria. *Journal of Business Research*, 32(2), 105-111.
- Tang, D. and Qian, X. (2007). Product Lifecycle Management for Automotive Development Focusing on Supplier Integration, *Computers in Industry* 59 (2008) 288-295.
- Thanaraksakul, W. and Phruksaphanrat, B. (2009). Supplier Evaluation Framework Based on Balanced Scorecard with Integrated Corporate Social Responsibility Perspective, *Proceedings of the International Multi Conference of Engineers and Computer Scientists*, Vol II, IMECS 2009, March 18 – 20(2009).
- Watts, C. A., and Hahn, C. K. (1993). Supplier development programs: an empirical analysis. *International Journal of Purchasing and Materials Management*, 29(1), 10-17.
- Vonderembse, M. A. and Tracey, M. (1999), The Impact of Supplier Selection Criteria and Supplier Involvement on Manufacturing Performance. *Journal of Supply Chain Management*, 35: 33–39.
- <http://www.iso.org/iso/home/standards/management-standards/iso14000.htm>
- <http://www.ohsas-18001-occupational-health-and-safety.com/>



PURCHASING POWER PARITY (PPP) BETWEEN CHINA AND THE U.S.: AN EMPIRICAL COMPARATIVE CASE STUDY

DOI: [10.17261/Pressacademia.201519949](https://doi.org/10.17261/Pressacademia.201519949)

Murat GIDIS¹, Fatih MANGIR², Hasan Murat ERTUGRUL³, Bansi SAWHNEY⁴

¹Energy Market Regulatory Authority. E-mail: mgidis@epdk.org.tr

²Selçuk University. E-mail: fmangir@selcuk.edu.tr

³Republic of Turkey Prime Ministry Undersecretariat of Treasury. E-mail: murat.ertugrul@hazine.gov.tr

⁴University of Baltimore. E-mail: bsawhney@ubalt.edu

Keywords:

Yuan-Dollar Exchange Rates,
PPP Hypothesis,
Unit Root Tests,
Fixed and Managed Floating
Exchange Rate Regime

ABSTRACT

This study investigates the validity of Purchasing Power Parity (PPP) in explaining China's real exchange rate with regard to the US over the period 2000-2012. It applies traditional unit root tests, and the procedure developed by Zivot and Andrews and Lee-Strazicich to endogenously determine potential structural breaks. The results indicate that while the PPP hypothesis holds under China's former fixed ("pegged") exchange regime, that, in the long run, it no longer holds under China's current managed floating exchange rate regime. In general, the findings lend support to the position that the exchange rate regime affects the validity of PPP theory for explaining exchange rates between countries.

JEL Classification:

F31, C22

1. INTRODUCTION

The mounting deficits in the trade between the U.S. and China trade have raised mounting concern in the U.S. over the yuan-dollar exchange rate. Many U.S. economists and policy makers are asking questions relating to China's exchange rate policy. In international economic theory, the determination of equilibrium real exchange rate is a key economic concept. It gains special importance during periods of currency crisis. Although there are a number of different methodologies to assess equilibrium exchange rates, ^[1] the purchasing power parity (PPP) hypothesis is one of the most studied in determining exchange rates in the economic literature. The topic of "PPP" was first introduced 85 years ago by the Swedish economist Gustav Cassel (Cassel, 1918). It has gained in popularity among economists ever since. Theoretically, PPP, based on the relative price levels between countries, has been generally accepted as the main theory of long-term equilibrium exchange rates. In its most common form, it asserts that changes in the exchange rate change between two currencies over the period of time is determined by the changes in the two countries domestic relative price levels (Dornbusch, 1985:1). When PPP holds continuously over time for two countries, then the volatility of the nominal exchange rate between countries will be no greater than the volatility of relative national prices (Taylor, 2003:438).

According to the Purchasing Power Parity (PPP), exchange rates and prices should adjust such that goods in different countries have the same price when expressed in the same currency (Absolute PPP). Relative PPP states that the percentage depreciation in the exchange rate between two currencies over any period equals the difference between inflation rates in the home country and in the foreign country. In the (very) long run changes in nominal exchange rates should reflect differences in inflation as predicted by relative PPP. The rationale of PPP depends on perfect arbitrage. Hence, from the empirical point of view, PPP is likely not to hold in the short run (Aizenman, 1984; Rogers and Jenkins, 1995).

The type of exchange rate regime in a country also affects the determining power of national price levels on exchange rates. Mussa (1986) argued that the real exchange rate volatility depends on the exchange rate regime adopted. From the early years of the transition until the current float, several empirical studies also have found that PPP failed to hold continuously due to high exchange rate volatility (Rogoff, 1996). One way, as suggested in this paper is, to examine the long-run validity of PPP is to test the hypothesis of stationary real exchange rate.

The purpose of this paper is to re-examine long-run purchasing power parity between the Chinese Yuan and the U.S. dollar. We apply stationarity tests on real exchange rates. PPP holds in the long-run if the real exchange rate is stationary. The most popular price and costs measures used are consumer prices (CPI), producer prices (PPI), GDP deflator, unit labor costs (ULC)^[2]. Several previous works have tested PPP with real exchange rate data constructed from nominal exchange rates and national price levels measured by consumer prices indexes (CPI). But, some of the measurement problems that have been encountered when testing PPP center on the use of these price indexes. Different countries weight their goods differently when measuring price changes, so that even choosing a different base year will yield different weights (Craig, 2005). We attempt to fill this gap in the literature by examining PPP with rescaled real bilateral exchange rates for two different types of exchange rate systems in China^[3].

This paper extends the empirical literature on Chinese PPP in three ways. First, we test for PPP for the Chinese yuan versus the US dollar rescaled real bilateral exchange rates. Secondly, we conduct a wide variety of unit root tests, including those that allow structural breaks. Third, we investigate the validity of PPP for two different types of exchange rate systems in China.

2. LITERATURE REVIEW

Over the last eighty years, numerous attempts have been made to test statistically whether or not the PPP theory holds. The majority of the empirical studies used data from the industrial developed countries with the dollar exchange rate being the most common rate analyzed. While studies that used very long sample periods provide some support for the existence of PPP, research that focused on shorter periods of time tended to find significant disparities between relative prices and exchange rates. (See Dornbusch 1992:236–244; Breuer 1994:245–277; and Rogoff 1996:647–668 for overviews of PPP research).

By far, there have been only a few empirical studies to test the validity of long-run purchasing power parity in China and the U.S.

The most recent studies include Darne and Hoarau (2006) examined the validity of long-run purchasing power in China for the period 1970:1 to 2006:5 using outlier methodology and showed that there is no tendency to the purchasing power parity in China to hold in the long run during this period. Waithe (2010) investigated the existence of PPP by means of a US-China case study and a cross-country analysis of 79 countries across different continents with varying economic status using monthly data from January 1994 to August 2009. He rejected the PPP hypothesis in the US-China case study, but supported the PPP hypothesis under the cross country analysis.

Yu and Zhu (2010) assessed the RMB exchange rate based on the monthly data of RMB/USD nominal exchange rate, Chinese Consumer Price Index (CPI) and the US CPI from May 1994 to December 2006. The results indicate that the 'strict' relative PPP doesn't hold while the 'weak' one (regression analysis) holds for RMB/USD exchange rate, which suggests that the variation of RMB/USD exchange rate has a tendency of reverting to the PPP level in terms of 'strict' relative PPP.

Guo (2010) applied time series and panel cointegration tests to both the official and the black market exchange rates in China over the period 1985-2006, and concluded that the real exchange rate in China is inconsistent with the long run PPP hypothesis in traded goods for both black market and official markets.

Several other studies used different methodologies. For example, Gil-Alana and Jiang (2011) employed fractional integration techniques to test the PPP hypothesis in the US/China relationship over the sample period 1994M01 to 2010M11. They found that there is no mean reversion for the real exchange rate between China and U.S. across the whole sample period.

Gregory and Shelley (2011) also found results from unit root tests that bilateral China – U.S. real exchange rate do not support purchasing power parity between the two countries. However, tests of the real equivalent exchange rate for the Chinese yuan versus a traded-weighted basket of currencies support purchasing power parity.

Giannellis and Kouretas (2012) have employed the linear and nonlinear unit root tests to investigate whether the adopted exchange rate policy can lead to the achievement of equilibrium in the foreign exchange market. They found that PPP equilibrium could not be established in periods of the fixed exchange rate regime.

3. METHODOLOGY

Formalized by Cassel (1918), the real Exchange (RER) rate can be defined in equation 1:

$$RER = EP^* / P \quad (1)$$

where E denotes the nominal exchange rate (measured as domestic currency price of foreign currency), P^* is an index of the foreign price level, and P is an index of the domestic price level.

Denoting logarithms in lower case letters, we therefore have equation 2.

$$r = e + p - p^*$$

(2)

“*r*” defines logarithmic form of real exchange rate and “*p*” and “*p*” denote the logarithms of the domestic and foreign country price index respectively.

The validity of long-run PPP requires the stationarity of real exchange rates. If *r* is stationary then deviations from PPP are temporary and will disappear with time, and hence PPP is likely to hold in the long run. But if “*r*” has a unit-root, then it implies that deviations from the parity are cumulative and not ultimately self-reverting.

This study aims to investigate stationarity properties of the real bilateral exchange rate of China employing both conventional unit root tests and unit root tests with structural breaks. In order to investigate stationary properties of the RER series, we employed conventional unit root tests including ADF (Dickey and Fuller, 1981), PP (Phillips-Perron, 1988), KPSS (Kwiatkowski, Phillips, Schmidt, and Shin, 1992) and Ng-Perron tests (2001) and unit root tests with structural breaks including Zivot-Andrews (1992 and Lee and Strazicich (2003) tests.

Empirical works based on time series data assume that the underlying time series is stationary. A stochastic process is said to be stationary if its mean and variance are constant over time and the value of the covariance between the two time periods depends only on the distance or gap or lag between the two time periods and not the actual time at which the covariance is computed (Gujarati, 2004). Stationary series exhibits mean reversion in that it fluctuates around a constant long-run mean and has a finite variance that is time invariant. On the other hand, a nonstationary series has no long run mean to which series returns and the variance is time dependent and goes infinity as time approaches infinity (Enders, 2004).

The most commonly used conventional unit root tests in empirical studies are ADF, PP and KPSS tests. However, the ADF, PP and KPSS tests have some limitations and may lead to a misleading conclusion (Silvia and Iqbal, 2011) ^[4].

Ng and Perron (2001) introduced four unit root test statistics that are calculated using generalized least squares (GLS) de-trended data for a time series variable to deal with the constraints of ADF and PP unit root tests. Compared to widely used Dickey Fuller (DF) and Philips Perron (PP) unit root tests, that has better power and size properties (Wickremasinghe, 2006)

The main criticism of testing PPP is based on the deficiency of conventional unit root tests that they are assumed to be temporary shocks that have no long-run effect on a variable. It is also recognized that the outliers and breaks in data may lower the power of unit root tests and lead toward over-acceptance of the unit-root hypothesis (Zhou and Kutan, 2011). Employing unit root tests with structural breaks for RER is one way of resolving conventional unit root tests failure. In that respect, we employ Zivot-Andrews (1992) test with one-break and Lee and Strazicich (2003) tests with two-breaks for the existence of unit roots and identify the order of integration for each variable.

The endogenous structural break test of Zivot and Andrews (1992) is a sequential test which utilizes the full sample and uses a different dummy variable for each possible break date (Byrne and Perman, 2006). They consider all three possible ways that a structural break can appear in a time series as Perron 1989.

Zivot and Andrews (1992) consider three different models (Models A, B and C) for the unit root test equation. Null hypothesis of unit root for these three models is same and shown in equation 3.

$$H_0 : Y_t = \mu + Y_{t-1} + e_t \tag{3}$$

Alternative hypothesis against null hypothesis of unit root is shown for every model in equation 4-6.

Model A

$$Y_t = \hat{\mu}^A + \hat{\theta}^A DU_t(\hat{\lambda}) + \hat{\beta}^A t + \hat{a}^A Y_{t-1} + \sum_{j=1}^k \hat{c}_j^A \Delta y_{t-j} + e_t \tag{4}$$

Model B

$$Y_t = \hat{\mu}^B + \hat{\beta}^B t + \hat{\gamma}^B DT_t^*(\hat{\lambda}) + \hat{a}^B Y_{t-1} + \sum_{j=1}^k \hat{c}_j^B \Delta y_{t-j} + e_t \tag{5}$$

Model C

$$Y_t = \hat{\mu}^C + \hat{\theta}^C DU_t(\hat{\lambda}) + \hat{\beta}^C t + \hat{\gamma}^C DT_t^*(\hat{\lambda}) + \hat{a}^C Y_{t-1} + \sum_{j=1}^k \hat{c}_j^C \Delta y_{t-j} + e_t \tag{6}$$

where $DU_t(\hat{\lambda})$ is dummy variable and shows break in constant and $DU_t(\hat{\lambda}) = 1$ if $t > T \cdot \lambda$ i, 0 otherwise; $DT_t^*(\hat{\lambda})$ is dummy variable and shows break in trend and $DT_t^*(\hat{\lambda}) = t - T \cdot \lambda$ if $t > T \cdot \lambda$ and 0 otherwise. Also; T_B shows break time and, $\lambda = T_B / T$ shows break point.

The critical values in Zivot and Andrews (1992) are different compared to the critical values in Perron (1989). The difference is due to that the selection of the time of the break is treated as the outcome of an estimation procedure, rather than predetermined exogenously (Glynn, Perera and Verma, 2007). According to Zivot-Andrews (1992) tests, the null hypothesis shows that the series have unit root. If the calculated t statistics for variables are greater than the critical values in their level forms, we reject null hypothesis of unit root and we say the variables are trend stationary. Otherwise we couldn't reject null hypothesis of unit root.

Lee and Strazicich's (2003) model allows for two endogenous breaks both under the null and the alternative hypothesis. They indicate that the two-break LM unit root test statistic estimated by employing LM test will not spuriously reject the null of a unit root. (Glynn, Perera and Verma, 2007).

Unlike from Zivot and Andrews (1992), Lee-Strazicich (2003) test uses Model A and Model C. For Lee-Strazicich (2003) test, Model A shows two breaks in constant and shown in equation 7.

$$\begin{aligned}
 Y_t &= \delta'Z_t + e_t, \quad e_t = \beta e_{t-1} + \varepsilon_t \\
 Z_t &= [1, t, D_{1t}, D_{2t}] \\
 &(7)
 \end{aligned}$$

Where Z_t is exogenous variables vector and T_{Bj} show break date. $J = 1, 2, \dots$ if $t > T_{Bj}$ $D_{jt} = 1$ and 0 otherwise.

Model C shows two breaks in constant and trend and shown in equation 8;

$$\begin{aligned}
 Y_t &= \delta'Z_t + e_t, \quad e_t = \beta e_{t-1} + \varepsilon_t \\
 Z_t &= [1, t, D_{1t}, D_{2t}, DT_{1t}, DT_{2t}] \\
 &(8)
 \end{aligned}$$

In equation (8) $J = 1, 2, \dots$ if $t > T_{Bj} + 1$ $DT_{jt} = t$ and 0 otherwise (Lee and Strazicich, 2003). Critical values are computed by Lee-Strazicich (2003).

According to test results, if the calculated t statistics for variables are greater than the critical values in their level forms, we reject null hypothesis of unit root with structural break and we say the variables are trend stationary. Otherwise we couldn't reject null hypothesis of unit root with structural break.

4. DATA AND EMPIRICAL RESULTS

In this study, we used real bilateral real exchange rates to test PPP for U.S. and China for the period 2000-2012. The exchange rate of the yuan was pegged constantly to the U.S. dollar until the middle of 2005. Since then, China adopted a managed floating exchange rate system. To test purchasing power parity under different exchange rate regime, we separated the analysis into two period: Fixed 2000: Month (M) 1-2005:M7 and Managed: 2005 M8 – 2012M2.

Nominal US dollar and Yuan exchange rates and CPI series were obtained from St. Louis FED, Electronic Data Delivery System. Real bilateral exchange rate series for Yuan/US dollar are denoted as BER. BER are weighted averages of bilateral exchange rates adjusted by relative consumer prices. The weighting pattern is time-varying, and the weights are based on trade in 2000-12. In order to investigate stationarity characteristics of BER series, we employ both conventional unit root tests including ADF (1979), PP (1988), KPSS (1992) and Ng-Peron (2001) tests and unit root tests with structural breaks including Zivot-Andrews (1992) test with one-break and Lee and Strazicich (2003) tests with two-breaks.

4.1. Results from Fixed Exchange Rate Regime: 2000 M1 – 2005M6

The results of conventional stationary tests are presented in Table 1.

Table 1: Conventional Unit Root Test Results

ADF Test Results				
BER	-3.862**			
ADF critical values for BER %1=-4.106 and %5=-3.480				
PP Test Results				
BER	-2.565	Δ BER		-6.176*
PP critical values for BER %1=-4.103 and %5=-3.479		PP critical values for Δ BER %1=-2.601 and %5=-1.946		
KPSS Test Results				
BER	0.231	Δ BER		0.040*
KPSS critical values for BER %1=0.216 and %5=0.146		KPSS critical values for Δ BER %1=0.216 and %5=0.146		
Ng-Perron Test Results				
	MZ_a	MZ_t	MSB	MPT
BER	-11.392	-2.368	0.208	8.095
Δ BER	-23.475	-3.418	0.146	1.070
Ng-Peron critical values for BER, MZa, MZt, MSB, MPT respectively; 1 % significance level -23.800, -3.420, 0.143 and 4.030 5 % significance level -17.300, -2.910, 0.168 and 5.480 Ng-Peron critical values for Δ BER; MZa, MZt, MSB, MPT respectively; 1% significance level -13.800, -2.580, 0.174 and 1.780 5 % significance level for -8.100, -1.980, 0.233 and 3.170 * denote %1 significance level, ** denote 5 % significance level				

According to Table 1,

- For ADF test the null hypothesis suggests that the series include unit root. The calculated t statistics for BER series is greater than the critical values at 5 % significance level. Thus, the null unit roots hypothesis can be rejected, suggesting that BER is stationary in their level forms according to ADF test.
- For PP test, the null hypothesis suggests that the series include unit root. The calculated t statistics for BER is less than the critical values. Thus, the null unit roots hypothesis cannot be rejected, suggesting that all variables are non-stationary in their level forms. The results of the first differenced variable show that PP test statistics for the variable is greater than critical values at 1% levels and the variable is stationary after differenced, suggesting that the variable is integrated of order I(1) according to PP test.

- For KPSS test, the null hypothesis shows that investigated series is stationary. The calculated t statistics for BER is greater than the critical values in their level forms and the results of the first differenced BER variable is less than critical values at 1% levels. KPSS test results suggest that BER series is I(1).
- For Ng-Peron test, according to, MZa and MZt tests the null hypothesis shows that the series have unit root and according to MSB and MPT tests the null hypothesis shows that the series are stationary. For MZa and MZt tests, the calculated t statistics for all variables are less and for MSB and MPT tests the calculated t statistics for all variables are greater than the critical values suggesting that all variables are non-stationary in their level forms. For the first difference of series, according to MZa and MZt tests, the calculated t statistics for the BER is greater and for MSB and MPT tests the calculated t statistics for the variable is less than the critical values at 1% levels suggesting that BER becomes stationary after differencing so that BER variable is I(1) according to Ng-Peron tests.

The results of unit root tests with structural breaks are presented in Table 2.

Table 2: Unit Root Tests with Structural Breaks

Zivot-Andrews (1992) Test Results		
	Level	
	Model A	Model C
BER	-5.41	-5.58
Critical values (%5)	-4.80	-5.08
Break Term	2002M2	2003M8
Lee-Strazitch (2003) Test Results		
	Level	
	Model A	Model C
BER	-3.89	-5.94
Critical values (%5)	-3.84	-5.71

- According to both Zivot-Andrews (1992) and Lee-Strazicich (2003) tests, the null hypothesis shows that BER has unit root. For both Zivot-Andrews (1992) and Lee-Strazicich (2003) tests, the calculated t statistics for BER variable is greater than the critical values in their level forms. Moreover both Zivot-Andrews (1992) and Lee-Strazicich (2003) tests suggest that BER variable is stationary in their level forms.

In summary; according to all conventional unit root tests except ADF, BER series is I(1). However, unit root tests with structural breaks shows that BER series is stationary in their level forms.

4.2. Results from Managed Exchange Rate Regime: 2005 M7 – 2012M2

The results of conventional stationary tests are presented in Table 3.

Table 3: Conventional Unit Root Test Results

ADF Test Results				
BER	-1.938	Δ BER	-4.611*	
ADF critical values for BER %1=-4.080 and %5=-3.468		ADF critical values for Δ BER %1=-2.595 and %5=-1.945		
PP Test Results				
BER	-1.830	Δ BER	-4.631*	
PP critical values for BER %1=-4.080 and %5=-3.468		PP critical values for Δ BER %1=-2.595 and %5=-1.945		
KPSS Test Results				
BER	0.222	Δ BER	0.096*	
KPSS critical values for BER %1=0.216 and %5=0.146		KPSS critical values for Δ BER %1=0.216 and %5=0.146		
Ng-Perron Test Results				
	MZ_a	MZ_t	MSB	MPT
BER	-8.606	-2.045	0.237	10.693
Δ BER	-29.451	-3.771	0.128	1.0404
Ng-Peron critical values for BER, MZa, MZt, MSB, MPT respectively; %1 significance level -23.800, -3.420, 0.143 and 4.030 %5 significance level -17.300, -2.910, 0.168 and 5.480 Ng-Peron critical values for Δ BER; MZa, MZt, MSB, MPT respectively; %1 significance level -13.800, -2.580, 0.174 and 1.780 %5 significance level for -8.100, -1.980, 0.233 and 3.170 * denote %1 significance level, ** denote %5 significance level				

According to Table 3,

- For both ADF and PP tests, the calculated t statistics for BER is less than the critical values. Thus, the null unit roots hypothesis cannot be rejected, suggesting that BER is non-stationary in their level forms. The results of the first differenced variables show that both the ADF and PP test statistics for the variable is greater than critical values at 1% levels and the variable is stationary after differenced, suggesting that it is I(1) according to ADF and PP tests
- The calculated t statistics for BER is greater than the critical values in their level forms and the results of the first differenced BER is less than critical values at 1% levels. KPSS test results suggest that BER is I(1).
- For MZa and MZt tests, the calculated t statistics for the variable is less and for MSB and MPT tests the calculated t statistics for the variable is greater than the critical values suggesting that the variable is non-stationary in their level forms. For the first difference of BER, according to MZa and MZt tests, the calculated t statistics for the variable is greater and for MSB and MPT tests the calculated t statistics for the variable is less than the critical values suggesting that the variable becomes stationary after differencing so that BER is I(1) according to Ng-Peron tests.

The results of unit root tests with structural breaks are presented in Table 4.

Table 4: Unit Root Tests With Structural Breaks

Zivot-Andrews (1992) Test Results				
	Level		First Difference	
	Model A	Model C	Model A	Model C
BER	-3.36	-3.05	-6.30	-6.34
Critical values (%5)	-4.80	-5.08	-4.80	-5.08
Break Term	2009M3	2009M3	2009M1	2009M1
Lee-Strazitch (2003) Test Results				
	Level		First Difference	
	Model A	Model C	Model A	Model C
BER	-2.29	-4.41	-6.85	-6.97
Critical values (%5)	-3.84	-5.71	-3.84	-5.71

- For both Zivot-Andrews (1992) and Lee-Strazicich (2003) tests, the calculated t statistics for BER variable is less than the critical values suggesting that the variable is non-stationary in their level forms. For the first difference of BER variable, the calculated t statistics is greater than the critical values. For both Zivot-Andrews (1992) and Lee-Strazicich (2003) tests suggest that BER is I(1).

5. SUMMARY AND CONCLUSION

Trade between China and the U.S. has been growing at a very rapid pace over the past thirty years. However, since China's exports have always been greater than of U.S. exports, trade between U.S. and China has created huge deficits for the U.S. Many economists believe that the Chinese policy of undervaluation of yuan significantly contributes to U.S. trade deficits with China. Because of concern over these deficits, decision makers in the U.S. have questioned China's policy regarding exchange rates. In this paper, in an attempt to answer the question of whether or not the exchange rate is linked with domestic prices in countries, we analyzed the validity of PPP under two different exchange rate regimes. In so doing, we used both conventional unit root tests (the ADF, PP, KPSS and Ng-Perron) and unit roots tests with structural breaks (Zivot-Andrews and Lee-Strazicich).

The study's two main findings point to the effect of China's exchange rate policy on relationship between the relative price level and the exchange rate. First, we provided evidence that the long-run PPP holds under a system of fixed exchange rate which means that changes in exchange rates equal changes in prices. The result indicates that there is full pass-through of exchange rate changes into prices under this period.

Second, our results confirmed that the managed float of China v. U.S. dollar has created a deviation from the PPP path of exchange rate. As noticed, some studies have claimed that the PPP is more likely to hold in open economies with low inflation^[5]. Indeed, countries with high inflation generally suffer from an exchange rate instability and constitute a priori good examples of PPP refutation (Drine and Rault, 2003:5). Our findings also support McKinnon and Schnabl (2009) and McKinnon et al. (2009)'s results. According to the conclusions reached in these studies, China should reinstall the fixed exchange regime to regain its control on the conduct of the monetary policy.

ENDNOTES

[1] The Balassa-Samuelson, the macroeconomic balance framework, the competitiveness of the tradable goods sector, estimated exchange rate equations, general equilibrium models.

[2] See Chinn (2006) for a nice overview of the theoretical underpinnings of various RER measures. In this working paper we focus on CPI-based RERs and weighted averages of bilateral exchange rates.

[3] Bilateral exchange rate is calculated using time-varying trade-weights based on Chinese trade flows and CPIs.

[4] See Silvia and Iqbal (2009) for more detail.

[5] Alba and Papell (2007)

REFERENCES

- Aizenman, Joshua, (1984), "Modeling Deviations from PPP", *International Economic Review*, 23:261–80.
- Alba, J.D. & Park, D. (2003), "Purchasing power parity in developing countries: multi-period evidence under the current float", *World Development*, 31(12):2049-2060.
- Breuer, Janice Boucher (1994) "An Assessment of the Evidence on Purchasing Power Parity". In *Estimating Equilibrium Exchange Rates*. John Williamson, ed. 245-277, Washington, D.C.: Institute for International Economics.
- Craig, Ben (2005), "The Growing Significance of Purchasing Power Parity", Federal Reserve Bank of Cleveland, ISSN 0428-1276
- Cassel, Gustav, (1918), "Abnormal deviations in international exchanges", *The Economic Journal*, 28:413-415
- Chinn, Menzie D. (2006), "A Primer on Real Effective Exchange Rates: Determinants, Overvaluation, Trade Flows and Competitive Devaluation", *Open Economies Review* 17: 115–143
- Dickey, D. A., & W. A. Fuller. (1981). "Likelihood ratio statistics for autoregressive time series with a unit root", *Econometrica*, 49 (4): 1057–72.
- Dornbusch, Rudiger, (1985), "Purchasing Power Parity", NBER Working Papers, 1591
- Dornbusch, Rudiger (1992) "Purchasing Power Parity" In *The New Palgrave Dictionary of Money and Finance*. Peter Newman, Murray Milgate and John Eatwell, eds. Vol. 3, 236-244, New York: The Stockton Press.
- Drine, Imed & Rault, Christophe, (2003) "A re-examination of the Purchasing Power Parity using non-stationary dynamic panel methods: a comparative approach for developing and developed countries," *William Davidson Institute Working Papers Series 2003-570*, William Davidson Institute at the University of Michigan.
- Enders, W. (2004), *Applied Econometric Time Series*, 2nd ed., John Wiley & Sons, Inc.
- Gil-Alana, Luis Alberiko and Jiang, Liang (2011), "The Purchasing Power Parity Hypothesis In The Us–China Relationship: Fractional Integration, Time Variation And Data Frequency", *International Journal of Finance & Economics*, DOI: 10.1002/ijfe.461

- Glynn, J., Perera, N. and Verma, R. (2007), "Unit Root Tests and Structural Breaks: A Survey with Applications", *Journal of Quantitative Methods for Economics and Business Administration*, 3(1): 63-79
- Guo, Q., (2010), "The Balassa-Samuelson model of purchasing power parity and Chinese exchange rates", *China Economic Review*, 21 (2):334-345.
- Gregory, Richard Paul and Shelley, Gary (2011), "Purchasing Power Parity and the Chinese Yuan", *Economics Bulletin*, 31 (2):1247-1255
- Gujarati, D.N. (2004), *Basic Econometrics*. 4th ed. McGraw-Hill Inc. New York, USA.
- Kwiatkowski, D., Phillips, P.C.B., Schmidt P. And Shin Y. (1992). "Testing the Null Hypothesis of Stationarity against the Alternative of a Unit Root," *Journal of Econometrics*, 54, 159-178.
- Lee, J., and MC Strazicich (2003), "Minimum Lagrange multiplier unit root test with two structural breaks", *Review of Economics and Statistics*, 85:1082-89.
- McKinnon, R., Schnabl, G., (2009). "The Case for Stabilizing China's Exchange Rate: Setting the Stage for Fiscal Expansion", *China & World Economy*, 17(1), 1-17
- Mussa, Michael (1986), "Nominal Exchange Rate Regimes and the Behavior of Real Exchange Rates: Evidence and Implications", *Carnegie-Rochester Conference Series on Public Policy*, 25(1):117-214
- Ng, S. and Peron P., (2001), "Lag Length Selection and the Construction of Unit Root Tests with Good Size and Power". *Econometrica*, 69(6), 1519-1554.
- Darne, Olivier & Jean-François Hoarau, (2006) "Testing the purchasing power parity in China," *EconomiX Working Papers 2006-18*, University of Paris West - Nanterre la Défense, EconomiX.
- Perron, P. & P. C. B. Phillips (1987), "Does GNP have a unit root? Areevaluation", *Economic Letters*, 23:139-145.
- Perron, P. & Vogelsang, T. (1992), "Nonstationarity and shifts with an application to purchasing power parity", *Journal of Business and Economic Statistics*, 10: 301-20
- Rogers, John H and Michael Jenkins, (1995), "Haircuts or hysteresis? Sources of movements in real exchange rates", *Journal of International Economics*, 38:339-60.

- Rogoff, K. (1996), "The purchasing power parity puzzle", *Journal of Economic Literature*, XXXIV (June) :647-668
- Silvia, J., & Iqbal, A. (2011), "The Empirical Evidence of Mean Reversion in the U.S. Labor Market 1970-2009", *International Journal of Economics and Finance*, 3(1):44-55
- Taylor, M.P. (2003), "Purchasing power parity", *Review of International Economics*, 11: 436–452
- Waithe Alastair J., (2010), Testing Purchasing Power Parity: A US-China Case Study And A Cross-Country Analysis, Phd Thesis, Brooklyn College, City University of New York
- Yu, Chunjiao and Zhu Longfei (2010), "Testing the validity of the purchasing power parity hypothesis: a study based on the RMB/USD exchange rate", *Int. J. of Networking and Virtual Organisations*, 7:(4)323 - 334
- Zhou, S. & Kutan, A. (2011), "Is the Evidence for PPP Reliable?: A Sustainability Exercise in the Stationarity of Real Exchange Rates", *Journal of Banking and Finance*, 35(9): 2479- 2490, 2011
- Zivot, E. & Andrews, (1992), "Further evidence of great crash, the oil price shock and unit root hypothesis", *Journal of Business and Economic Statistics*, 10: 251-270.



COMPETITIVE CONDITIONS IN THE TURKISH BANKING SYSTEMS

DOI: 10.17261/Pressacademia.201519950

Taner SEKMEN¹, Omer AKKUS², Ilyas SIKLAR³

¹Eskişehir Osmangazi University. E-mail: tsekmen@ogu.edu.tr

²Anadolu University. E-mail: oakkus@anadolu.edu.tr

³Anadolu University. E-mail: isiklar@anadolu.edu.tr

Keywords:

Competition,
Panzar-Rosse Model,
Turkish Banking Sector,
H-Statistic

ABSTRACT

In this paper, we investigate competition in the Turkish banking sector over the period 2003– 2012. To understand the competitive conditions in the Turkish banking sector, we use the well-known Panzar-Rosse model based on a nonstructural estimation of the H-statistic by employing the quarterly panel data set. The empirical evidence indicates that the Turkish banking sector operates under conditions of monopolistic competition. Therefore, although there have been growing structural changes in the Turkish banking sector since the 2000s, there has been no remarkable change in the market structure of the Turkish banking sector compared to previous studies, and it can still be characterized by monopolistic competition.

JEL Classification:

1. INTRODUCTION

Turkey's banking sector went through significant structural changes following the 2000-2001 economic crisis. In the aftermath of the crisis, a rise in the interest rate, depreciation of the Turkish Lira and a depression in economic activity adversely influenced the profitability of banks in Turkey. Corresponding with financial and functional revival efforts, the number of banks, branches of banks and the number of employees were reduced as a consequence of the Banking Sector Reconstruction Program. The equity of private banks was reinforced. Merger and acquisition activities were encouraged. The economic crisis highlighted the crucial role that banks have in the Turkish economy.

The banks have a vital role due to different aspects of the economy. For instance, economic developments in the banking system accelerate the liberalization of capital flow, expanding the common market within countries. Further, the improvements occurring in the banking sector stimulate the service innovation in financial markets and the internationalization of banking activities. On the other hand, the competitive pressure occurring in the banking industry and the deterioration of the banks as a financial intermediary alter the banking behavior and market structures. The changing market structure for banks plays a substantial role in capital accumulation and economic prosperity.

There are some general reasons why the market conditions in the banking industry deserve particular attention. For instance, financial austerity and financial stability may be influenced in some ways by the degree of competition and concentration (Yeyati and Micco, 2003). From a theoretical point of view, competition may have a detrimental impact on economic stability if it drops the bank charter value. Therefore, the incentives for cautious risk-taking behavior exhibit a tendency to decrease. According to this view, the promise of extraordinary profits occurring in the course of time with the presence of market power decreases the agency problem of limited banks. More aggressive risk taking could lead to stricken competition (Cerasi and Daltung, 2000). From another point of view, a more concentrated system is more likely to demonstrate “too big to fail”, a problem whereby large banks increase their risk exposure expecting the reluctance of the regulator to let the bank fail in the event of insolvency problems (Hughes and Mester, 1998).

According to Lerner (1934), the theory maintains that banking competition could be a direct result of the markup of price over the marginal cost. The theory suggests a good way to measure banking competition. However, in practice, it is difficult to measure the degree of competition due to the absence of detailed data on cost and the prices of bank products. The literature has created several measurement techniques to evaluate competitive conditions in the banking industry. The structural and non-structural approaches can be viewed to be the two main measurements methods. The structural methods are based on the Structural Conduct Performance (SCP) paradigm, which was developed by Mason (1939) and Bain (1951) and estimates that more concentrated markets are more collusive. Competition is a proxy for measures of bank concentration. However, the empirical banking literature has indicated that concentration is broadly a weak measurement of competition; see, e.g., (Shaffer, 1989, 1993, 2004), (Shaffer and Disalvo, 1994), (Claessens and Laeven, 2004). The Panzar-Rosse approach and Bresnahan-Lau method are two non-structural methods of evaluating competition in the style of the New Empirical Industrial Organization (NEIO) literature. Both methods are based on the derivation of profit-maximizing equilibrium conditions, which is their major advantage over more empirical approaches. Their test statistics are systematically related to one another and to alternative measurements of competition such as the Lerner index (Lerner, 1934).

Our paper focuses on the Panzar-Rosse (P-R) revenue test. This approach has been widely used in empirical banking studies. The Panzar-Rosse approach estimates a reduced-form equation relating gross revenue to a vector of input price and other control variables. The measure of competition, usually called the “H statistics”, is attained as the sum of the elasticities of gross revenue with respect to input price. The aim of this paper is to assess the current market structure of the banking industry and the degree of competition in Turkey over the period 2003-2012 using the Panzar-Rosse H-statistic.

The rest of paper is organized as follows: the second section outlines the evolution of the Turkish banking sector and discusses the crucial properties of the Turkish banking sector regulations; the third section presents an overview of the empirical literature on banking competition; the fourth section presents the Panzar-Rosse Analytical Framework and describes the econometric model and data to be used; the fifth section addresses the estimation results of the empirical analysis; and the sixth section summarizes the findings of the research.

2. OVERVIEW OF THE TURKISH BANKING SECTOR

During the 1980's, the Turkish economical system witnessed many structural changes such as regulations in financial liberalization and the banking system. In this context, the interest rate ceiling system collapsed, the exchange rate was left to fluctuation, liberalization was ensured and the Interbank Money Market was established to regulate liquidity conditions in the banking system. Additionally, the Capital Markets Board and the Istanbul Stock Exchange was established to increase the competitiveness and efficiency in the financial markets. The transition to a fully convertible form of the Turkish Lira was achieved only after capital account liberalization in 1989. New entries into the banking system were facilitated, and the operations of foreign banks were encouraged to increase the competitiveness and efficiency in the banking system. In addition, Turkish banks started operating abroad by purchasing banks or launching branches and representative offices. The fact that exchange rate regulations have become increasingly liberal has dramatically increased the exchange rate transactions of banks.

Despite positive improvements during the 1980's, many structural problems began emerging. Initially, government banks in the banking system had a significant presence. The distortions resulting from the duty losses of these banks marked the 1990s. Moreover, new bank licensing resulting in the market entry of new banks was made on the basis of political criteria that created a disruptive effect on efficiency and development in the banking sector (Alper and Öniş, 2004: 25-55). In addition, supervision and regulation in the banking sector were weak, and they were directly involved in the regulation process (Alper and Öniş, 2004: 25-55). During this period, because of the absence of a properly regulated and closely audited banking system, the entry of foreign banks in the sector has been at a negligible level.

During the 1990s, private banks witnessed significant instabilities. First, in the beginning of the 1990s, the loan policy of private banks was swapped from external debt sources to internal debt instruments. Because government securities income was high, banks began reducing traditional banking activities such as giving credit to the real sector and invested more in these government securities, which were more risk free. This situation, at the same time, motivated new entries into the banking sector. In addition, new banks have been established by industrial groups for the purpose of using collected deposits as an asset to finance their own companies. In consequence, the increase in the number of banks continued in the 1990s as well. In the free capital movement environment, many banks, especially private banks, tried to benefit from arbitrage opportunities. Banks were moving into debt with foreign currency, but they were holding government securities in the TL unit. Consequently, they had a weak position that made them extremely vulnerable to speculative attacks.

In addition, insufficient capital amount, maturity mismatch, high deficit level, inadequate risk management experience and mismanagement contributed to structural problems in the banking sector (Akyüz and Boratav, 2002; Sayilgan and Yıldırım, 2009).

All these negative conditions and characteristics have placed the banking system in a vulnerable position with regard to macroeconomic crises. Financial crises in 2000-2001 made the banking system even worse, and it was already weak.

In the years 1997-2002, because they did not fulfill their liabilities, 21 banks were transferred to the Saving Deposits Insurance Fund (SDIF). After the 2000-2001 financial crisis, with the start of the transition to a strong economic program, Turkey's economy experienced a remarkable recovery. A vital part of this program was the restructuring of the banking system, which created positive outcomes. Restructuring governmental banks in financial and operational terms, the consolidation of private banks, and developments in the field of regulation and supervision contributed to the improvement in the banking system. The banks bought by SDIF were either sold or joined, or liquidity conditions were improved. As a result, the number of the deposit banks was reduced. Moreover, positive macroeconomic conditions and the recapitalization and restructuring process in the banking sector, which contributed to attracting foreign investors' attention in the consolidation process, enhanced direct capital flow. In the 1990s, banks that were the main source of financing government deficit finally returned to the traditional role of being an intermediary to finance households and the financial sector.

Table-1 illustrates the changes of the number of banks in the Turkish banking system in the years 2000-2014. In addition, it demonstrates the composition of the operation fields of banks (i.e., deposit vs. development and investment) and the total number of assets. As mentioned previously, during the 1990s, because of the convenience of founding a bank and the attractiveness of the banking business, the number of banks has been exponentially increasing. In the years 1990 and 1995, the number of banks was 66 and 68, respectively, but in the year 2000, this number reached 79. As indicated in the table, because many banks went bankrupt and transferred to SDIF, during the financial crisis in 2000-2001, the number of banks started to decrease. After 2001, the number continued to diminish, and since 2005, it has stabilized. The main reason for the decrease after 2002 is the restructuring of the banking system and the consolidation process of the Turkish banks especially with regard to foreign banks, which resulted from positive macroeconomic conditions.

Table 1: Number of Banks in the Turkish Banking System 2000-2014

	2000	01	02	03	04	05	06	07	08	09	10	11	12	13	14
Deposit Banks	61	46	40	36	35	34	33	33	32	32	32	31	32	32	32
State-Owned	4	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Private	28	22	20	18	18	17	14	11	11	11	11	11	12	10	10
SDIF	11	6	2	2	1	1	1	1	1	1	1	1	1	2	1
Foreign	18	15	13	13	13	13	15	18	17	17	17	16	16	17	18
Development and Investment Banks	18	15	14	14	13	13	13	13	13	13	13	13	13	13	13
State-Owned	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Private	12	9	8	8	8	8	6	6	6	6	6	6	6	7	7
Foreign	3	3	3	3	2	2	4	4	4	4	4	4	4	3	3
Total	79	61	54	50	48	47	46	46	45	45	45	44	45	45	45

Figure 1 presents the change in ownership of the banks. Since 2000, the number of domestic banks with private ownership has been decreasing. The decrease in the beginning of the 2000s was substantially based on the transfer of the banks to SDIF. However, this situation is a result of the consolidation process with foreign banks in recent years.

Moreover, owing to positive macroeconomic conditions and developments in the banking sector after the crisis, the market share of foreign banks increased. Since the year 2000, the number and proportion of governmental banks have comparatively stabilized.

Figure 1: The Ownership Composition of Banks in Turkey: 2000-2014

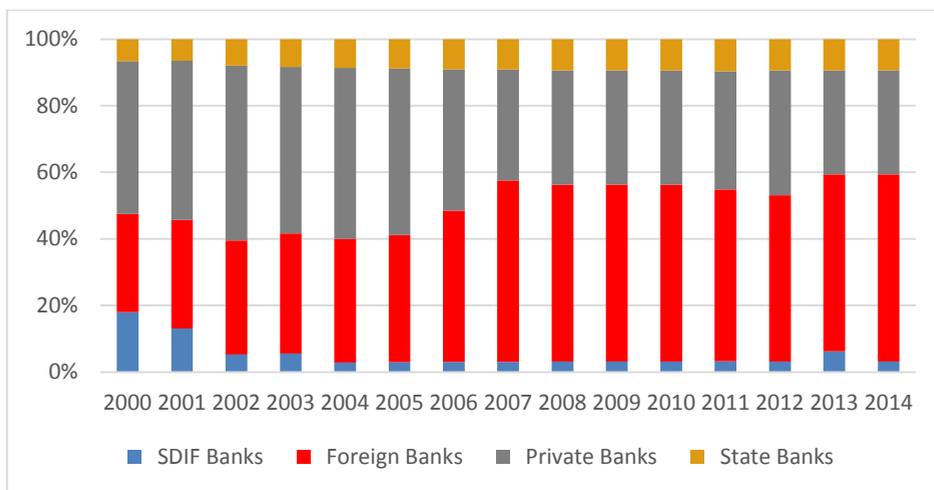
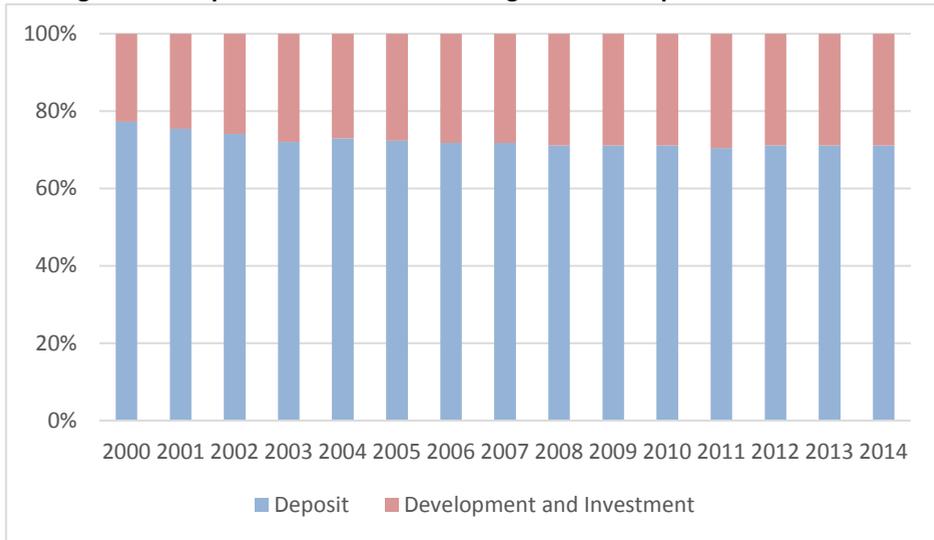


Figure 2 indicates the composition of banks according to the operational range. In general, the portion of deposit banks is greater than the portion of development banks. The proportion of deposit banks in the Turkish banking system is approximately 75%. However, since the year 2000, the proportion of deposit banks has been constantly decreasing, and it was, to some degree, fixed during 2000-2014.

Figure 2: Composition of Banks According to Field of Operation: 2000-2014

Nevertheless, the competitive conditions of the banking system in Turkey have never been satisfactory, and a modern system that is flexible and market-oriented is needed. However, with liberalization and deregulation, an apparent improvement was seen in competitiveness. Despite the reduction in market concentration due to the deregulation during the period before the crisis, reduction in the number of banks has considerably increased since the crisis, in addition to bank consolidation and the formation of mega banks. Along with these changes, there are growing concerns regarding market power in Turkish banking sector

3. LITERATURE REVIEW

Although there are comprehensive studies of banking competition in the literature, the Panzar-Rosse methodology is used by a very limited number of studies. Shaffer (1982) examined the competitive conditions in New York using a cross-section series. According to Shaffer's study, the banks were neither as monopolistic nor as perfectly competitive in the long run. Nathan and Neave (1989) applied the cross-section series for Canadian Banks for the 1982-1984 period. Their estimation results indicated that Canadian Banks had monopolistic competition structures. Bikker and Haaf (2000) found monopolistic competition in the banking industry using 23 industrialized countries for the 1988-1998 period. De Bandt and Davis (2000) examined four countries, and their estimation results suggested that competition was stronger for banks operating more in international markets and weaker for banks operating in local markets. Bikker and Haaf (2002) made an assessment of the banking industries in 17 European countries and 6 non-European countries. Their study indicated that all the countries had nearly monopolistic competition. The large banks were much more competitive than the small banks, and the environment in the international market was much more competitive than in the local market.

Claessens and Laeven (2003) used bank-level data and examined the competitive conditions of the banking systems in 50 countries. They argued that monopolistic competition is the best description of the degree of competition. Bikker and Groeneveld (2000) examined the competitive structure of the European Union (EU) banking industry as a whole and also for individual EU countries for the 1989-1996 period. Their study indicates that nearly all countries had a monopolistic competition structure, although competition in Ireland and Denmark was relatively low. Weill (2004) investigated the relationship between competition and efficiency in banking with a sample of 12 EU countries during the period 1994–1999. This study supported the idea that there is a negative relationship between competition and efficiency in banking. Yildirim and Philippatos (2002) examined the competitive conditions in the banking industries of fourteen Central and Eastern European transition economies for the period 1993-2000. The results suggested that the banking industries in these countries, except for those of Macedonia and Slovakia, had a monopolistic competition structure under the period. Moreover, the large banks in transition countries were operating in a relatively more competitive environment, whereas the competition was lower in local markets compared to national and international markets. Drakos and Konstantinou (2003) focused on the competitive conditions in the banking industry of Central and Eastern European countries for the period 1992-2000. The study results suggested that banking in transition economies as a whole was consistent with a monopolistically competitive market structure.

Gelos and Roldos (2004) evaluated the competitive conditions of a sample of Latin America and Central and Eastern European countries for the period 1994-1999. The results indicated that the banking industry had monopolistic competition for all countries except for Argentina and Hungary. Murjan and Ruza (2002) assessed some Middle Eastern countries from 1993 to 1997, and the results indicated that the market had monopolistic competition. It was found that oil-producing countries were less competitive than non-oil-producing countries. Some recent empirical studies about the issue can be listed as follows: Casu and Girardone (2009) for European countries, Delis and Tsionas (2009) for European countries, Maudos and Fernandez de Guevara (2007) and Andries and Capraru (2012a) for European countries, Koetter et al. (2012) for the U.S.A., Al-Muharrami and Matthews (2009) for the Arab Gulf, Fu and Heffernan (2009) for China, and Andries and Capraru (2013) for 27 European Union Countries. There are not many studies determining competitive conditions using the Panzar and Rosse model in the Turkish banking industry. Aydın (1996), for the period 1991-1994, and Emek (2005), for the period 1990-2003, obtained results indicating that the market was monopolistic according to their estimation, whereas Kasman (2001), for the period 1983-1996, Gelos and Roldos (2004), for the period 1994-2000, Claessens and Laeven (2004), for the period 1994-2001, Günalp and Celik (2006), for the period 1990-2000, Aysan and et al. (2007), for the period 2001-2005, and Celik and Kaplan (2010) found a monopolistically competitive market for the Turkish banking sector.

4. DATA AND METHODOLOGY

To measure competition in the banking sector, we adopt the Panzar and Rosse (1987) methodology, which aims to estimate the degree of competition. The Panzar and Rosse model provides the H-statistic as a measure of competition. The H-statistic is the sum of the elasticities of the reduced form revenue function with respect to factor prices. The reduced form revenue function can be described as follows:

$$R_{it} = f(w_{it}, Z_{it}, Y_{it}, \varepsilon_t)$$

where w_{it} is the vector of factor prices, Z_{it} is the variables shifting the cost function, Y_{it} is the variables shifting the demand function and ε_t is the error term. $\partial R_{it} / \partial w_{itk}$ illustrate the derivative of total revenue with respect to the price of the k th input, and the H-statistic can be written as follows¹:

$$H = \sum_k \left[\frac{\partial R_{it}}{\partial w_{itk}} \frac{w_{itk}}{R_{it}} \right]$$

To test the market equilibrium, we use the following specification of the reduced form of the revenue equation for a panel data set:

$$\ln TR_{it} = \alpha + \beta_1 \ln W_{L,it} + \beta_2 \ln W_{F,it} + \beta_3 \ln W_{C,it} + \gamma \ln TA_{it} + \delta \ln NPL_{it} + \theta \ln NL_{it} + \varepsilon_{it}$$

where it denotes bank i at time t , TR is the ratio of total revenue (or gross interest revenue) to total assets, W_L is the unit price of labor (the ratio of personnel expenses to total assets), W_F is the unit price of fund (the ratio of interest expenses to total deposits), and W_C is the unit price of capital (the ratio of other operating and administrative expenses to total assets). In addition, a set of variables composed of bank-specific factors is included in the model. These variables include TA , which is the total assets to control the potential size effect of banks, NPL is the ratio of non-performing loans to total assets, NL is the ratio of net loans to total assets and ε is the error term. We also use two additional macroeconomic control variables, the nominal treasury bill rate (INT) and the inflation rate (INF). It is clear that all of the variables are in natural logarithm to represent the elasticity of coefficients.

The H-statistic is the sum of the elasticities of the total revenue with respect to the input prices, $H = \beta_1 + \beta_2 + \beta_3$. The Panzar-Rosse (1987) H-statistic was basically designed to determine the market structure. The market structure is characterized by a monopoly, a perfectly colluding oligopoly or a homogeneous conjectural variations oligopoly when the H-statistic is negative or equal to zero ($H \leq 0$). An increase in the input prices raises marginal costs and reduces equilibrium output as well as total revenue under these market structures. Under perfect competition, because an increase in input prices increases both marginal and average costs without shifting the optimal output decision of any individual bank, the value of the H-statistic is equal to unity ($H = 1$).

¹ For a more comprehensive explanation of the H-statistic, see Panzar and Rosse (1987)

If the H-statistic is between zero and unity, the market structure is considered a monopolistic competition ($0 < H < 1$). In a monopolistic competition market, an increase in revenue will be less than a proportional increase in input prices.

In the empirical applications, the monopoly model is noted by the rejection of the $H \leq 0$ hypothesis. The rejection of hypothesis $H \leq 1$ does not accompany the above three models, and the rejection of the $H \leq 0$ and $H = 1$ hypotheses together indicate that only the monopolistic competition model is coherent with the data (Panzar and Rosse 1987). Finally, a crucial assumption of the Panzar-Rosse model is that the banking markets are in long-run equilibrium. To control the long-run equilibrium assumption, Shaffer (1982) suggests a test based on the H-statistic (or E-Statistic). The competitive capital markets will equalize the risk-adjusted rate of return across banks in equilibrium, and hence, the input prices should not be significantly correlated to the rate of return. The long-run equilibrium test is performed by running the same regression but using the pre-tax return on assets ROA as the dependent variable instead of total revenue.

$$\ln ROA_{it} = \alpha + \beta_1 \ln W_{L,it} + \beta_2 \ln W_{F,it} + \beta_3 \ln W_{C,it} + \gamma \ln TA_{it} + \delta \ln NPL_{it} + \theta \ln NL_{it} + \varepsilon_{it}$$

$E = \sum_{i=1}^3 \beta_i$ is the sum of the elasticities of the reduced form revenue function with respect to factor prices. $E = 0$ indicates that the markets are in equilibrium. In empirical applications, the dependent variable is usually $\ln(1 + ROA)$ instead of $\ln ROA$ because ROA may take small negative values.

We employ quarterly balanced panel data covering the period 2003Q1 to 2012Q4 for 10 of the biggest banks in Turkey. Bank-level data for all banks are gathered from The Banks Association of Turkey, whereas the nominal treasury bill rate (INT) and the inflation rate (INF) are obtained from the Central Bank of the Republic of Turkey Database (CBRT). The sample, composed of the biggest 10 banks listed by The Banks Association of Turkey in the banking system according to total assets, represents an approximately 87% share in the total assets for the period under this study. Table 1 indicates the summary statistics of the variables in the sample period.

Table 1: Descriptive Statistics

Variable	Obs.	Mean	Std. Dev.	Min.	Max.
ROA	400	.006951	.0070998	-.1078472	.0366739
ROA1	400	1.006951	.0070998	.8921528	1.036674
IR	400	1458.526	943.9017	73.56	4892.154
R	400	.0296864	.008413	.009521	.0739355
TR	400	2372.98	1507.712	33.311	6468.84
TRO	400	.0485998	.0142979	.0005227	.1847103
W_L	400	.0036213	.0012267	.0016282	.0079643
W_F	400	.0268607	.0098464	.0045063	.083586
W_C	400	.0060745	.0051477	.0010177	.0889986
TA	400	55285.48	42784.17	2273.011	175444.5
NPL	400	.0607729	.0922607	.0086166	.8970762
NL	400	.4595439	.1499711	.0070735	.7058426
INF	400	.096752	.0447968	.0435056	.2718
INT	400	.1676325	.0820434	.0792	.456

Table 2: Correlation Matrix Between Dependent Variables

	W_L	W_F	W_C	TA	NPL	NL	INF	INT
W_L	1.000							
W_F	0.263	1.000						
W_C	0.337	0.145	1.000					
TA	-0.713	-0.462	-0.340	1.000				
NPL	0.076	0.661	-0.000	-0.215	1.000			
NL	0.125	-0.535	0.036	0.099	-0.575	1.000		
INF	0.219	0.627	0.166	-0.298	0.414	-0.400	1.000	
INT	0.338	0.778	0.231	-0.521	0.441	-0.568	0.872	1.0

5. RESULTS

In Table 3, we report the results of the Panzar-Rosse model for two different dependent variables, total revenue TR and interest revenue IR. The regression models are estimated using the random effects estimator. The sample includes the 10 biggest banks in Turkey for the period 2003-2012. Selecting the 10 biggest banks reduces significantly the unobserved heterogeneity; thus, the random effects estimator is more coherent with data that is quite homogeneous. Moreover, our choice of the random effects versus OLS and the fixed effects estimators is supported by the implementation of the Breusch-Pagan LM test and the Hausman test, respectively. The statistical tests confirm that the model fits the data very well. The Wald Chi2 test is significant at the 1% level in all models. To control heteroscedasticity, the robust standard errors are applied.

Column 2 and 3 indicate the regression results for total revenue TR as the dependent variable, whereas column 4 and 5 indicate the results for interest revenue IR.

In both column 2 and 3, the sign of coefficients for all input prices W_L , W_F and W_C are always positive, but only the coefficient of the price of the fund W_F is statistically significant and is bigger than the other two inputs in all regressions. Although the coefficients and statistics for the prices labor W_L are quite close to each other in Models 1 and 2, the coefficient of W_L is statistically significant at only the 10% level in Model 2. Column 4 and 5 report the regression results for the interest revenue IR, and the results are similar to those of the first two models. However, the coefficients for the price of capital W_C are statistically significant for all regressions, and the sign of coefficients is negative in Models 3 and 4. The three bank-specific factor variables included in the regressions are the total assets TA to control the potential size effect of banks, NPL as the ratio of non-performing loans to total assets, and NL as the ratio of net loans to total assets. The variable TA has a positive sign and is highly significant in all regressions. Thus, it is clear that there is a potential size effect. The other independent variable, the ratio of non-performing loans to total assets NPL, has statistically insignificant coefficients for all regressions, and the coefficients have a positive sign for Model 2. Conversely, the ratio of net loans to total assets NL has a statistically significant and positive effect on total revenue but is insignificant on interest revenue. To control the macroeconomic environment, two additional variables, nominal treasury bill rate INT and inflation rate INF, are included in the regressions. The macroeconomic control variables display unstable results. Although the inflation rate INF has a negative effect on both the total revenue and interest revenue, it is statistically significant at only the 10% level for interest revenue. Finally, the coefficient of the nominal treasury bill rate INT is not statistically significant and has a different sign for the two dependent variables.

Table 3: Panel Regression Results of Competitive Conditions in the Turkish Banking Market

Variables	Model(1)	Model(2)	Model(3)	Model(4)
	TR	TR	IR	IR
lnW _L	0.105 [0.065]	0.106* [0.059]	0.122* [0.073]	0.135 [0.084]
lnW _F	0.238** [0.103]	0.257** [0.103]	0.528*** [0.049]	0.490*** [0.077]
lnW _C	0.063 [0.051]	0.063 [0.042]	-0.022 [0.038]	-0.033 [0.041]
lnTA	0.935*** [0.028]	0.926*** [0.043]	0.966*** [0.024]	0.976*** [0.021]
lnNPL	0.002 [0.034]	-0.003 [0.036]	0.018 [0.030]	0.022 [0.027]
lnNL	-0.160** [0.074]	-0.166* [0.086]	-0.055 [0.043]	-0.043 [0.039]
lnINF	-0.064 [0.045]		-0.060* [0.036]	
lnINT		-0.067 [0.125]		0.017 [0.077]
Constant	-0.863** [0.407]	-0.687 [0.497]	-0.804*** [0.235]	-0.832** [0.405]
Number of Observations	400	400	400	400
Number of Bank	10	10	10	10
Hausman Test	4.13 (0.764)	5.31 (0.621)	11.22 (0.129)	11.31 (0.125)
Breusch-Pagan LM	28.27 (0.000)	27.99 (0.000)	194.26 (0.000)	183.79 (0.000)
H-Statistic	0.406	0.426	0.628	0.592
Wald Test (Chi2) for H = 1	27.18	20.43	15.03	9.83
P- value	(0.000)	(0.000)	(0.000)	(0.001)
Wald Test (Chi2) for H = 0	12.72	11.24	43.13	20.79
P- value	(0.000)	(0.000)	(0.000)	(0.000)

Note: * Denotes significance at the 10% level, and ** at the 5% level and *** at the 1% level. The robust standard errors of coefficients are in brackets. The probability values are presented also in brackets for Hausman Test, Breusch-Pagan LM and Wald Test

The findings of the H-statistic are also shown in Table 3. The H-statistics lie between 0 and 1 for all specifications of the dependent and independent variable. In our first specifications (for total revenue), the H-statistics are smaller than the other specifications of the dependent variable (for interest revenue). For the period 2003–2012, the average value of the H-statistic is 0.513 and is found to be statistically significant in all different specifications. The Wald tests indicate that H-statistics differ significantly from both zero and unity, and thus, we clearly reject the hypotheses of monopoly ($H \leq 0$) and perfect competition ($H = 1$) for the Turkish banking market during the period under study. Therefore, the results indicate that the Turkish banking market can be characterized as having monopolistic competition. Finally, Table 4 displays the long-run equilibrium results derived from running the same regressions for the pre-tax return on assets lnROA and $\ln(1 + ROA)$ as the dependent variable instead of lnTR and lnIR.

We test the null hypothesis $E = 0$ using the Wald test for the long-run equilibrium conditions, and the results of the Wald test indicate that the null hypothesis cannot be rejected in all regressions. Therefore, the long-run equilibrium condition is supported for the Turkish banking market during the period 2003-2012.

Table 4: Equilibrium Test for the Turkish Banking Market

Variables	Model(1) ROA	Model(2) ROA	Model(3) 1+ROA	Model(4) 1+ROA
lnW _L	-0.368*** [0.135]	-0.339** [0.156]	-0.001 [0.003]	-0.001 [0.003]
lnW _F	-0.210* [0.118]	-0.083 [0.235]	-0.000 [0.001]	-0.003 [0.002]
lnW _C	0.062 [0.123]	0.066 [0.137]	-0.006 [0.006]	-0.006 [0.006]
lnTA	-0.208*** [0.062]	-0.284*** [0.079]	-0.002** [0.001]	-0.001 [0.001]
lnNPL	-0.175*** [0.068]	-0.204** [0.092]	-0.001 [0.001]	-0.000 [0.001]
lnNL	-0.422*** [0.128]	-0.448*** [0.164]	-0.001 [0.003]	0.000 [0.003]
lnINF	-0.237* [0.140]		0.002 [0.002]	
lnINT		-0.353 [0.326]		0.004 [0.003]
Constant	-6.894*** [0.632]	-5.654*** [1.318]	-0.012 [0.010]	-0.021 [0.015]
Observations	394	394	400	400
Number of Bank	10	10	10	10
Hausman Test	7.76 (0.354)	16.45 (0.021)	6.42 (0.491)	13.16 (0.068)
Breusch-Pagan LM	67.14 (0.000)	65.25 (0.000)	11.34 (0.000)	10.44 (0.001)
E-Statistic	-0.516	-0.356	-0.007	-0.010
Wald Test (Chi2) for H = 0	1.97	0.84	0.37	0.00
P- value	(0.160)	(0.360)	(0.540)	(0.966)

Note: * Denotes significance at the 10% level, and ** at the 5% level and *** at the 1% level. The robust standard errors of coefficients are in brackets. The probability values are presented also in brackets for Hausman Test, Breusch-Pagan LM and Wald Test

6. CONCLUSION

Since the financial crisis of 2000-2001, the Turkish banking industry has witnessed dramatic structural changes. First, 21 banks were transferred to the SDIF. Although the ratio of privately owned domestic banks has continuously declined, the share of foreign banks has been increasing since the 2000s. Moreover, the total number of deposit banks decreased from 61 to 32 between 2000 and 2012; in addition, the mega banks were created. The ongoing changes in the Turkish banking sector may affect the market structure and the competitive conditions by increasing the market concentration.

Therefore, this paper focused on the market structure of the Turkish banking sector over the period 2003-2012. To assess the degree of competition, the study adopted the Panzar-Rosse approach. Our main findings based on the H-statistics suggested that the banking sector in Turkey is characterized by monopolistic competition. This result may reflect that the Turkish banking industry is dominated by the 10 largest banks, which have approximately an 87% share of the total assets for the period under this study. Our results are generally consistent with earlier studies that claimed that there was a monopolistic competitive condition.

Finally, to interpret whether there is a change in the market structure of the Turkish banking industry and changes in regulatory rules after the financial crisis of 2000-2001, the results of this study can be compared with the results of the studies applied to data for Turkey before the 2000s (see Aydın (1996), Emek (2005), Kasman (2001), Classens and Leaven (2004), Gelos and Roldos (2004), Günalp and Çelik (2006), Aysan and et. al (2007), Çelik and Kaplan (2010)). Although there have been a growing number of changes in the Turkish banking sector since the 2000s, there has been no remarkable change in the market structure of the Turkish banking sector and it is still characterized by monopolistic competition.

REFERENCES

- Akyüz, Y. and Boratav, K. (2002), The Making of Turkish Financial Crisis, UNCTAD Discussion Paper, 158
- Al-Muharrami, S. and Matthews, K. (2009). Market power versus efficient-structure in Arab GCC banking. *Applied Financial Economics*, 19, 1487–1496.
- Alper, C. E and Öniş, Z.(2004),The Turkish Banking System and the IMF in the Age of Capital Account Liberalization, *New Perspectives on Turkey*, 30, 25-55
- Andries, , A. M. and Capraru, B. (2012a). Competition and efficiency in EU27 banking systems. *Baltic Journal of Economics*, 12(1), 41–60.
- Andries, A.M. and Capraru, B. (2013). The nexus between competition and efficiency: The European banking industries experience. *International Business Review*, 22(5), 1046-1059.
- Aydinli, I. (1996) Market Structure of the Turkish Banking System: 1991-1994 (in Turkish), Capital Markets Board Publication, No. 40, Ankara.
- Aysan, A.F., Güneş, A. and Abbasoğlu, O.F.(2007), Concentration, Competition, Efficiency and Profitability of Turkish Banking Sector In the Post-Crisis Period, Boğaziçi University, Department Of Economics, Research Paper, ISS/EC 2007-20, Istanbul.

- Bain, J. S. (1951). 'Relation of Profit Rate to Industry Concentration', Quarterly Journal of Economics, Vol. 65, pp. 293–324.
- Bikker, J.A. and Groeneveld, J.M. (2000). Competition and Concentration In The EU Banking Industry, Kredit Und Kapital, 33, 62-98.
- Bikker, J.A. and Haaf, K. (2000). Measures of Competition and Concentration in The Banking Industry: A Rievew of The Literature. De Nederlandsche Bank Research Series Supervision, No: 27, September.
- Bikker, J. A and Haaf, K. (2002). Competition, Concentration and Their Relationship: An Empirical Analysis of the Banking Industry. Journal of Banking and Finance, 26(11), 2191-2214.
- Casu, B. and Girardone, C. (2009). Testing the relationship between competition and efficiency in banking: A panel data analysis. Economics Letters, 105, 134–137.
- Celik, T. and Kaplan, M. (2010), Türk Bankacılık Sektöründe Etkinlik ve Rekabet :2002-2007,Sosyoekonomi, 2010(2), 100201.
- Cerasi, V. and Daltung, S. (2000). The Optimal Size of a Bank: Costs and Benefits of Diversification. European Economic Review, 44, 1701-1726.
- Claessens, S. and Laeven, L. (2003). What Drives Bank Competition?, Some International Evidence, World Bank Policy Research Working Paper No.3113, World Bank.
- Claessens, S., and Laeven, L. (2004). What Drives Bank Competition?, Some International Evidence, Journal of Money, Credit, and Banking, 36, Part 2, 563-584.
- De Bandt, O. and Davis, E.P. (2000). Competition, Contestability and Market Structure in European Banking Sectors On The Eve Of EMU. Journal of Banking and Finance, 24, 1045-1066.
- Delis, M. and Tsionas, E. (2009). The joint estimation of bank-level market power and efficiency. Journal of Banking and Finance, 33(10), 1842–1850.
- Drakos, K. and Konstantinou, P. (2003). Competition and concentration in transition banking: an empirical analysis. EEFS Conference, Heraklion, Crete
- Emek U. (2005). Bankacılık Sisteminde Rekabet ve İstikrar İkileminin Analizi : Türkiye Örneği, Doktora Tezi, Ankara Ünivesitesi Sosyal Bilimler Enstitüsü, Ankara.

- Gelos, R.G. and Roldos, J., (2004). Consolidation and Market Structure In Emerging Market Banking Systems. *Emerging Markets Review* 5, 39– 59.
- Günalp, B. and Celik T. (2006). Competition in the Turkish Banking Industry, *Applied Economics*, 38, 1335-1342.
- Fernandez de Guevara, J., Maudos, J. and Perez, F. (2007). Integration and competition in the European financial markets. *Journal of International Money and Finance*, 26, 26–45.
- Hughes, J.P. and Mester, L. (1998). Bank capitalization and cost: Evidence of scale economies in risk management and signaling. *Review of Economics and Statistics*, 80, 314-325.
- Kasman, A. (2001). Competitive Conditions in the Turkish Banking Industry, *Ege Akademik Bakis*, 1(2), 72-82.
- Koetter, M., Kolari, J. W. and Spierdijk, L. (2012). Enjoying the quiet life under deregulation? Evidence from adjusted lerner indices for U.S. banks. *Review of Economics and Statistics*, 94(2), 462–480.
- Lerner, A. (1934). The Concept of Monopoly and the Measurement of Monopoly Power. *Review of Economic Studies* 1, 157–175.
- Mason, E.S. (1939). Price and production policies of large-scale enterprises. *American Economic Review* 29 (Supplement), 61–74.
- Murjan, W. and Ruza, C. (2002). The competitive nature of the Arab Middle Eastern Banking Markets. *International Advances in Economics*, 267–275.
- Nathan, A. and Neave, E.H. (1989). Competition and Contestability in Canada’s Financial System: Empirical Results, *Canadian Journal of Economics*, 22(3), 576-594.
- Sayılğan, G and O. Yıldırım (2009), Determinants of Profitability in Turkish Banking Sector: 2002-2007, *International Research Journal of Finance and Economics*, 28, 207-214.
- Shaffer, S. (1993). A test of competition in Canadian banking. *Journal of Money, Credit and Banking* 25, 49–61.
- Shaffer, S. (1989). Competition in the US banking industry. *Economic Letters*, 29, 323-323.

- Shaffer, S. (2004). Patterns of competition in banking. *Journal of Economics and Business*, 56, 287-313.
- Shaffer, S. and Disalvo, J. (1994). Conduct in a banking duopoly. *Journal of Banking and Finance*, 18, 1063–1082.
- Weill, L. (2004). On the relationship between competition and efficiency in the EU banking sectors. *Kredit and Kapital*, 3, 329–352.
- Yeyati, E.L., and Micco, A., (2003). Concentration and Foreign Penetration in Latin American Banking Sectors: Impact on Competition and Risk (Inter-American Development Bank, Research Department, Working Paper 499).
- Yildirim, H.S. and Philippatos, G.C. (2002). Competition and Contestability in Central and Eastern European Banking Markets, University of Tennessee, Working Paper, September.



TO DISCUSSION OF POST-CRISIS DRIVERS OF GEORGIA'S ECONOMIC GROWTH

DOI: [10.17261/Pressacademia.201519951](https://doi.org/10.17261/Pressacademia.201519951)

Tatiana PAPIASHVILI¹, Ilyas CILOGLU²

¹ International Black Sea University, Georgia. E-mail: t.papiashvili@ibs.u.edu.ge

² International Black Sea University, Georgia. E-mail: ciloglu@ibs.u.edu.ge

Keywords:

Economic growth,
Post-crisis model,
Georgia, SMEs

ABSTRACT

Statistics evidence that drivers of pre-crisis model of economic growth in Georgia (foreign direct investment and financial/banking sector development) are constrained. The modification of pre-crisis to post-crisis model consists of further reorientation from consumption to investment component of GDP and diversification of investment sources. FDI have to be accomplished by internal (private) investment, the main generator of which are SMEs. SMEs gather small private savings and transfer them to private investment. SMEs might play a greater role in country's economic growth.

JEL Classification: E20

1. INTRODUCTION

In global times it is important to have national specific model-strategy-policy of economic development and economic growth. In different countries drivers of economic growth are different. Since Keynesian Revolution manipulation of government expenditures to stimulate or to restrict aggregate demand/aggregate expenditures and GDP growth has become common for most government policies all around the world. Other Keynesian strategies widely used by fast growing countries are to rely on foreign trade (for example, European economies) and FDI (foreign direct investment). Some macroeconomic policies are focused on extension of domestic demand. For instance, since 2008 Chinese, Indian and Turkish apparel firms have shifted production from shrinking global markets to expanding domestic consumption and markets. A limited set of growth strategies is available for small emerging economies such as Georgian one. These countries usually face limited budget resources, they orient on FDI growth but they also can enter world and/or regional markets with niche products. The last strategy may be very beneficial when it is available for any business - large, small or medium, no matter the size. The fact is that in globalized world not only the largest global companies and investors but small businesses and individual entrepreneurs can play a larger role (Manyika et al.,2014).

The paper contributes to a broad academic discussion on the topic of economic growth in emerging country and more specifically, on post- crisis drivers of economic growth in Georgia.

The aims of the article are defined as follows: (1) to observe economic growth operating strategy in Georgia; (2) to identify the main sources (drivers) of economic growth in the country; (3) to develop recommendations for further modification of growth model through drivers diversification.

The main message of the article is that a modified growth model for post-crisis Georgian economy is needed. The model favors diversified investment-led growth which includes both FDI and private investment. Small and medium enterprises (SMEs) generate most part of private (internal) investment.

The applied research method is a well-known Keynesian aggregate expenditures (AE) model that is $AE = C+I+G+Xn$ where C is consumers' expenditures, I is investment expenditures, G is government spending and Xn is net exports (exports minus imports). The paper provides quantitative and qualitative analysis of each of four major components of GDP in Georgia, tracking current trends against past experience. Analyses are based on wide statistical data and surveys, conducted by international organizations and by the authors.

The rest of the paper is organized as follows. The next section explores the basics of economic growth models for Georgia. The third section examines key macroeconomic fundamentals of Georgian economy. Analysis of components of Georgian operating economic growth model is the topic for the fourth section. It includes statistical observation of last trends in consumer expenditures, investment, government spending, and net exports. The fifth section considers elaboration of foundations of pro-growth post-crisis model summarizing the surveys conducted by international organizations and the authors. Last section provides a summary.

2. ECONOMIC GROWTH IN GEORGIA: REVIEW OF MODELS

Georgian scientific community discusses prominent proposals how to achieve sustainable economic growth. National strategies and priorities change as soon as top officials change their offices. Large-scale, all-encompassing program of Saakashvili's government named the Economic Liberty Act (Government of Georgia, 2011) was replaced by more pragmatic but less liberal and not worked up to the end strategy of the new government. The crucial difference between these two programs consists in different understanding of role of market and government in economy. That is, more market and less government vs. less market and more government. In fact, the discussions are held on a standard platform that consists of neoclassical and new Keynesian theories. Using a simple neoclassical production function, growth can be decomposed into the contributions of capital accumulation, labor force growth, and total factor productivity growth. Based on Keynesian aggregate expenditures (AE) model that is $AE = C+I+G+Xn$ where C is consumers' expenditures, I is investment expenditures, G is government spending and Xn is net exports (exports minus imports), four major components of GDP are evaluated in terms of their constrains and future perspectives.

The World Bank formulated proposal as saving orientation policy , “The low saving rate in Georgia is a key impediment to sustaining adequate investment and rapid economic growth” (Georgia Rising, 2013; p.7-10, 16-19). Another recommendation proceeds from assumption that Georgia has the potential to increase sustainable and inclusive growth through strengthened focus on private sector-led job creation (Country partnership, 2014; p.1-9). This program has twin goals - private sector development that generates employment and provides income opportunities for the bottom 40 percent of the population. In another version economic growth is projected at an average of 5.5 percent a year over the medium-term, on the back of improving trade and investments (Georgia: Adjusting, 2014; p.11-12).

The World Bank sent the clear message to the government of Georgia, “The central challenges today for the government of Georgia is to find sources of long-run economic growth, particular through private sector development” (Fostering, 2013; p.15).

Paradoxically, despite the differences in general understanding of foundation of modern economy, short-run economic growth strategies are not so different. In particular, emphasis was and is still made on development of a single sector of Georgian economy in which the country has or may have a comparative advantages, for example, wine and tourism (Kakulia, 2007; Cordonnier, 2006; Shmidt, 2007; Economic Growth; 2007; Cordonnier, 2010; Samson,2008). And actually in all programs the priority is still the policy of attraction of foreign direct investment (FDI), “Growth was fueled by high foreign direct investment before the global economic crisis of 2008, a period of easy finance worldwide” (Country partnership, 2014; p.1).

There is no doubt, that each of these plans has a real base to be put into life. In this article it is not going to be discussed their strengths/weaknesses (see, for example, (Cecire, 2009b; Cecire, 2010; Livny, 2009). As the economic reality shows, the question of drivers of economic growth model is still open to discussion.

3. METHODOLOGY AND DATA

3.1. Georgian Economy Macroeconomic Landscape: Statistical Retrospective

To define the drivers of economic growth, analysis of past economic trends is needed. Table 1 presents Georgian statistics on key macroeconomic fundamentals. The observation is done for the last seven years or the time from the beginning of global financial crisis of 2007.

Table 1: Georgian economy – key macroeconomic fundamentals

	2007	2008	2009	2010	2011	2012	2013
Real GDP growth rate (%)	12,3	2,3	-3,8	6,3	7,2	6,2	3.2
GDP per capita (at current prices), USD	2314,6	2921,1	2455,2	2623,0	3230,7	3523,4	3596.6
GNI per capita, PPP (current international \$)	5,470	5,630	5,440	5,730	6,140	6,760	7,040
Inflation rate (CPI), %	109.2	110.0	101.7	107.1	108.5	99.1	99.5
Unemployment rate, %	13.3	16.5	16.9	16.3	15.1	15.0	14.6
Exchange rate, USD/GEL average of the same period	1,6703	1,4902	1,6705	1,7826	1,6860	1,6513	1.6634
FDI, million USD	215,0	1 564,00	658,4	814,5	1117,2	911,6	941.9
FDI, total as % of GDP	16,5	11,1	6,3	5,8	6,2	3,9	5,6
FDI growth rate, %	+69	-22	-58	+24	+37	-18	+3

Source: Compiled and calculated by the authors; source of data: World Data Bank (2013); Geostat, Bulletin of Monetary and Banking Statistics (2013), Bulletin of Monetary and Banking Statistics (2012), Bulletin of Monetary and Banking Statistics (2011), Bulletin of Monetary and Banking Statistics (2010), Balance of payment of Georgia (2012), Balance of payment of Georgia (2011). Balance of payment of Georgia (2012), Annual Report (2012). National Bank of Georgia., Annual Report (2013).National Bank of Georgia.

In the period before the global financial crisis of 2007 (in 2004 – 2007) GDP grew by 9 percent in average. In observed period from 2007 through 2008 the Georgian economy was a post-Soviet success story with double digit growth rates (GDP growth rate 12.3 percent in average) and rocketing FDI inflows (9.4 percent in average), flourishing banking and financial sectors. Successful FDI and financial/banking sectors policies were the catalyst of economic growth in the country. From the end of 2008 and during 2009 due to the global financial crisis/global recession waves reached the developing world and August war with Russia, the situation changed. Thanks to international support and financial aid Georgian economy did not suffered recession in the ways as developed economies were effected. In 2010 -2011 Georgian economy experienced recovery with FDI and GDP growth rates 6.3 percent and 7.2 percent, respectively. 2012 was quite successful as well.

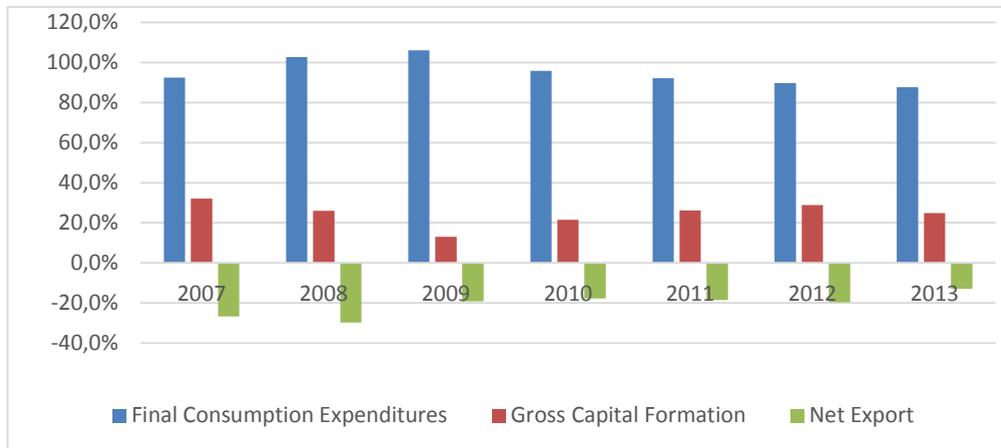
Thus, as statistic evidences Georgia achieved robust economic growth between 2004-2012, averaging 6.1 percent annually. The growth was supported by structural reforms and increased FDI rather than by net job creation. Relatively low growth in 2013 (3.2 percent) is explained by “post-election policy uncertainty and weak budget execution encouraged a wait-and-see behavior among businesses and consumers and impacted growth” (World Bank; 2014). The environment changed at the end of the year and in the fourth quarter of 2013, real GDP grew by 7.1 percent (National Bank, 2013; p.16). Eleven months average of 2014 GDP growth rate was 5 percent (GeoStat).

3.2. Statistical Observation of Components of Georgian Operating Growth Model

Unfortunately, Georgian statistic on GDP by categories of use provides too general information (Figure 1). For instance, “final consumption expenditures of households include expenditures for purchasing consumer goods and services and also other consumption of goods and services in kind, produced for own use” (Geostat).

This means that the volume of expenditures is artificially extended. Despite this fact, the past trends are clear. Consumer expenditures, both households and government, generate the major part of Georgian GDP while the net exports have negative value at least in course of the observed period.

Figure 1: GDP by categories of use, %



Source: Geostat

Table 2 provides more detail information about households' incomes and expenditures in Georgia.

Table 2: Households' Incomes And Expenditures In Georgia

	2007	2008	2009	2010	2011	2012	2013
Total incomes of the population, million GEL ¹	5121,6	6536,4	6904,8	7790,4	8533,2	9705,6	10882,8
Total expenditures of the population, million GEL	5505,6	6673,2	6736,8	7413,6	8320,8	9430,8	10686
Savings of the population, GEL	-384	-136,8	168	376,8	212,4	274,8	196,8
Savings of the population, as % of GDP	-	-	0,9	1,8	0,9	1,1	0,7
Total expenditures of the population, as % of GDP	32,4	35,0	37,5	35,7	34,2	36,0	39,8
GNP per capita, PPP (current international \$)	5,470	5,630	5,440	5,730	6,140	6,760	7,040

Source: Compiled and calculated by the authors; source of data: Geostat , World Data Bank.

From statistical evidence (Table 2) (indicator is GNP per capita in PPP of current international dollar) Georgia is low-level middle-income country. Another remarkable fact is that while per-capita incomes rose substantially since 2004, real GDP in 2012 was still only 78 percent of its 1990 level and Georgia remains one of the lowest income countries in the Europe and Central Asia region. In particular, in 2011, the level of per-capita GDP in Georgia was at 77 percent of the average level of non-resource rich CIS countries, 41 percent of Turkey, 25 percent of the EU-10 countries, and 13 percent of industrial countries (Georgia Rising, 2013; p.3-4). Despite this, above 1/3 of GDP is generated by expenditures and the last years the upward trend is observed.

As in any typical low income country, Georgian population savings are low and during some periods dissaving is observed, for instance, in 2007-2008, the years of global financial crisis. Thus, saving cannot be considered as a potential significant source of internal investment and GDP growth. Besides, the analysis of labor market shows that household's income and private consumption are under the pressure of unemployment. Particular, labor statistics depicts quite stable but paradoxical situation in the labor market in terms of employment and unemployment rates. Firstly, there is a gap between statistical data and real situation in the labor market. Actual unemployment significantly exceeds official statistical data because it includes all types of "hidden" unemployment which has been increasing (Papiashvili, 2013). Secondly, at least from 2006 (and there is no reason to expect that the situation was different before) the share of self-employed was higher than hired or more than a half of all employed were self-employed (Geostat). In other words, despite the successful FDI policy and impressive GDP growth in 2006-2007 and the 2010-2011 recovery, there is still a limited pool of job opportunities available. This statistical phenomenon is usually called as "paradox of growth" (Papiashvili, 2013).

So, in the nearest future it is unrealistic to expect economic growth in the country driven by domestic consumption. As it was mentioned, Georgian government has relied on FDI as the most significant part of investment and source of GDP growth. Since 2007-2008 global financial crisis, consumption and business activity in Georgia have been constrained by weak FDI (Table 1) and the slow global recovery. Specifically, according to the McKinsey Global Institute, in 2007 financial flows among the G-20 were about 18 percent of their GDP while in 2013 only 4,5 percent or shrank by about 60 percent. Most of the decline was between developed economies, most notably within Europe. Cross-border lending to emerging markets fell by more than 80 percent from 2007 to 2012 (Manyika et al., 2014; p.28). Thus, the lack of financing available from international credit markets caused FDI flows to Georgia to shrink – about halved during 2009-2010. Unfortunately, "downside risks to global growth remain. Chief among them is a renewed increase in financial market volatility, especially in emerging market economies" (World Economic, 2014; p.48). Additionally, external shock such as tighter financial conditions in the United States, financial contagion and trade disruptions from geopolitical events, and slower-than-expected emerging market growth make unpredictable FDI sustainable flow.

Summarizing these trends, economists recognized that since 2007 things have changed and a new trend, New Normal, has been forming (Davis, 2009; Gross, 2009). New Normal concept describes new economic reality when advanced economies are growing very slowly. Therefore, from global perspective Georgia has to expect further deterioration of FDI flows and foreign trade.

Banking and financial sectors were another driver of Georgian GDP growth during pre-crisis period. These sectors are strongly linked to international financial markets due to the fact that most Georgian banks are foreign banks (for example, in 2013 from 21 Georgian banks 20 were foreign ones or foreign controlled (Bulletin, 2013; p.25). Not surprisingly, deterioration of international environment negatively affected Georgian banking and financial sectors as well.

Like in any emerging country, Georgian government has limited financial resources, despite the fact that according to the World Bank evaluation of budget deficits, fiscal policy is broadly appropriate. In 2013 budget deficit accounted 2,9 percent of GDP comparing to recommended level of not more than 3 percent (Table 3). Since 2010, the years of recovery, government debts, total and external public debts and budget deficits were quite high that have discouraged many infrastructure projects and negatively contributed to economic growth in the country (National Bank, 2013; p.17). Finally, the recession and lower demand in international markets contracted Georgian exports, decreased imports and increased trade deficit (Table 3).

Table 3: State Budget and International Trade in Georgia

	2007	2008	2009	2010	2011	2012	2013
Exports, total as % of GDP	31,3	28.8	29.8	34.9	36.5	38.2	18.0
Imports, total as % of GDP	58.2	58.6	48.9	52.7	55.5	57.9	48.9
Trade balance as % of GDP	-39.1	-37.6	-31.3	-30.8	-33.7	-34.5	-30.9
Export / Import Ratio	23.8	23.7	25.2	31.9	31.0	30.3	39.9
Foreign debt to GDP, total as % of GDP	15,1	22,9	28,1	36,1	37,3	41,0	43.9
Budget deficit, as % of GDP	-4.8	-6.5	-9.2	-6.7	-3.6	-2.8	-2.9
Total public debt, as % of GDP	25.5	31.2	41.0	42.4	36.5	34.9	34.5
External public debt, as % of GDP	16.8	23.5	31.7	33.6	28.8	27.6	27.0

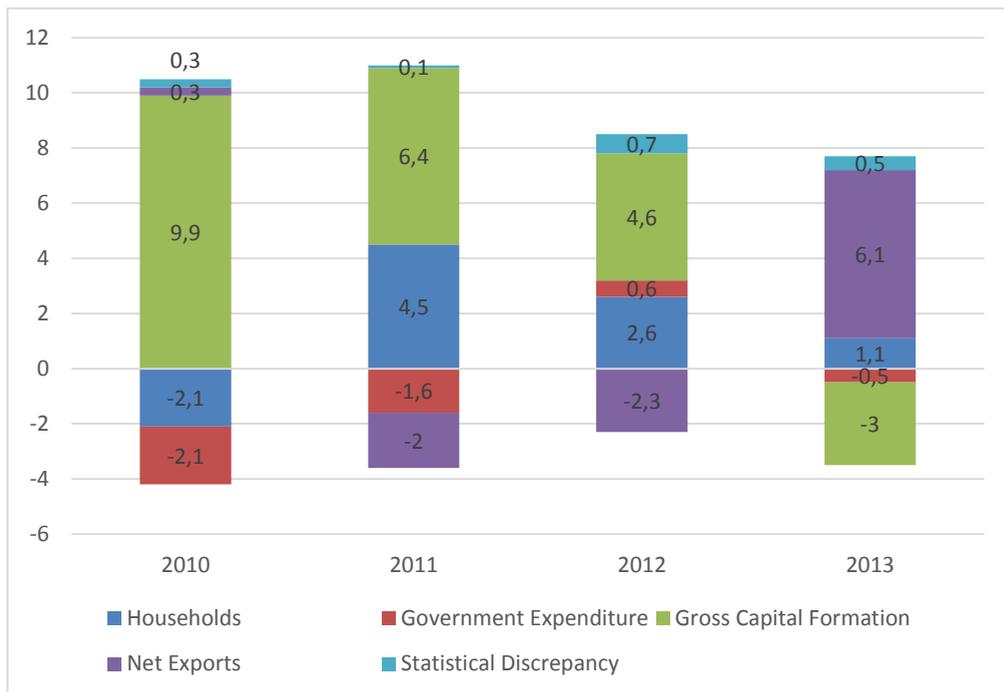
Source: Compiled and calculated by the authors; source of data: Geostat

The commodity structure of Georgia's exports has also not changed much over the last decade, with resource-based products such as metals and minerals still dominant. More generally, exports have played insignificant role in driving growth.

Additional constrain for FDI flow and foreign trade is uncertain and unstable global economic and geopolitical situation, local/regional conflicts, international sanctions against Russia. The last Russia- Ukraine conflict, two countries that are one of the main CIS investors and trading partners for Georgia, further deteriorates both political and economic situation in the region, escalates tensions, elevates risks for investment climate, deteriorates regional and international trade and FDI flows, creates new challenges and geopolitical risks for Georgian economy.

Figure 2 sums up. From year to year GDP growth in Georgia was driven by different components that included consumers expenditures, investment (mostly FDI), and net exports.

Figure 2: GDP growth by expenditures.



Source: National Bank of Georgia. Annual Report, 2013, p.18

3.3. Elaborating the model

Obviously, elaborating the model of growth, two things should be taken into account. On one side, in Georgia the main pre-crisis drivers of economic growth remain constrained that causes pre-crisis model to be inefficient. Moreover, because of negative global and regional economic and political trends, at least in medium term Georgian economy would not benefit from mass FDI or even tackle low FDI and GDP growth. On another side, there is no need to reinvent bicycle. To build entrepreneurial and innovative economy, based on stronger and more durable and sustainable economic growth, Georgia needs a modified model of economic growth and development. The modification consists of further reorientation from consumption to investment component of GDP growth. That is, the model should include a combination of both external and internal sources of growth with further emphaties on the last one or FDI should be complemented with internal investment to form the core component or driver of GDP. Internal investments are generated by domestic businesses. It is worth to note, that (1) the original area from which entrepreneurial activity is born, is SME sector; (2) 95-96 percent of all registered Georgian enterprises are small and medium size enterprises; (3) SMEs development is based on self-financing or private investment. To complete the research, we conducted survey. The survey was conducted among firms in Tbilisi in June – July of 2014. Respondents were selected through convenience sampling.

180 questionnaires were distributed and 116 of them returned; response rate is 64,4 percent. We had a good response rate because many of selected companies were our students' families small firms. 20 questions related to the development of small business in Georgia were asked. Our respondents are young (78,4 percent are younger than 41), educated (59,5 percent got university diploma, 29,3 percent have Master degree and 6,0 percent have Ph.D. degree) people. Most of them (81,0 percent) works as managers for small firms (number of hired workers is less than 20) in different sectors of economy, mostly hotel and restaurant business (22,4 percent), trade (16,4 percent), transport and communication (6,9 percent), etc, that in general corresponds to the distribution of SMEs according to the economic activity in the whole country. Answering the question "Over the past two years, which way of finance do you use more intensively?", 56,9 percent of respondents respond of using internal finance, that is personal and friends savings. At the same time, most respondents (62,1 percent) believe that banking loans are still very important at startup as well growth stages.

The survey conducted by the World Bank (Enterprise Survey, 2013) includes all enterprises and shows even more pessimistic picture. Specifically, in Georgia the main enterprise financing source for investment is internal finance (about 73 percent) among all other sources (trade credit financing, bank financing, equity and sale of stocks, etc.). In working capital external financing constitutes around 20 percent, one of each three firms have bank loans (Enterprise Survey, 2013; p.11). The last indicator includes all firms, no matter the size, but it should be corrected taking into account the fact that bank loans are available mostly for large companies due to huge value of collateral needed for loans. In Georgia collateral is more than 200 percent of loan amount. In 2013 share of SMEs in gross loans was 20 percent or about two times less comparing to of corporate (38 percent) (National Bank, 2013; p.57).

Therefore, the conducted surveys evidence that SMEs gather small private savings and transfer them to private investment, wherein entrepreneur spirit and talent, stimulus and incentives of SMEs owners and managers work as a multiplier in this transferring. Thus, SMEs might play a greater role in country's economic growth.

4. CONCLUSION

When direct effects of the last global financial crisis of 2007-2008 were not much destroying, indirect effects created much more challenges for Georgian economy. The financial crisis exposes the weakness in Georgian growth formula. Economists agreed that pre-crisis GDP growth was heavily depended on FDI and financial/banking sector development (Georgia Rising, 2013; Country partnership, 2014). With the drop in FDI, Georgian economy has become vulnerable to external forces and shocks. When shocks materialize, external sources for Georgian economic growth become more and more unpredictable and vulnerable.

Elaboration of the post-crisis growth model is based on several principles. First of all, internal forces/drivers of growth have to be exploited more intensively. From sectoral decomposition of growth (tourism, agriculture, etc.) focus should be moved to economic components of GDP – household consumption, investment, government expenditures, net exports.

Brief statistical analysis has shown that (a) household consumption was and is weak and it is under the pressure of unemployment; (b) government expenditures are limited; (c) net exports is weak , regional and geopolitical situation as well as slow growth in main trade partners negatively affect Georgia international trade and form downward trend.

The modification of pre-crisis model to post-crisis model consists of further reorientation from consumption to investment component of GDP growth. That is, the model should include a combination of both external and internal sources of growth with further emphases on the last one. In other words, sources of investment should be diversified. FDI must be accomplished by internal (private) investment, the main generator of which are SMEs. SMEs gather small private savings and transfer them to private investment, wherein entrepreneur spirit and talent, stimulus and incentives of SMEs owners and managers work as a multiplier in this transmission. Thus, SMEs might play a greater role in country's economic growth.

There is no alternative or a trade-off between FDI and SME private investment, it is their synergy. SMEs development can create friendly business environment for FDI. Nowadays SMEs are hidden source of economic growth in Georgia.

The new growth strategy would require regulatory and institutional reform but they are the subject for future research.

REFERENCES

- Annual Report. National Bank of Georgia (2013).
- Annual Report. National Bank of Georgia (2012).
- Balance of payment of Georgia (2012). National Bank of Georgia.
- Balance of payment of Georgia (2011). National Bank of Georgia.
- Bulletin of Monetary and Banking Statistics, # 178 (January-December, 2013). National Bank of Georgia.
- Bulletin of Monetary and Banking Statistics, # 166 (January-December, 2012). National Bank of Georgia.
- Bulletin of Monetary and Banking Statistics, # 154 (January-December, 2011). National Bank of Georgia.
- Bulletin of Monetary and Banking Statistics, # 142 (January-December, 2010). National Bank of Georgia.
- Cecire M. (2010). Entrepreneurship and Georgia's Future. Evolutsia.Net. Retrieved August 5, 2011 from <http://www.evolutsia.net/entrepreneurship-and-georgias-future/>
- Cecire M. (2009a). Georgia Needs Real Education Reform. Evolutsia.Net. Retrieved August 5, 2011 from <http://www.evolutsia.net/georgia-needs-real-education-reform/>

- Cecire M. (2009b). Will Economic Freedom Save Georgia? Retrieved September 7, 2011 from <http://www.evolutsia.net/will-economic-freedom-save-georgia/>
- Cordonnier, C. (March 2006). Georgia 's Economic Growth : How to Avert Possible Risks in Future. Georgian Economic Trends, p.48-56
- Cordonnier, C. (April 2010). EU Export Market Conditions for the Realisation of the Competitive Advantages of Georgian Agricultural Products. Retrieved August 7, 2011 from <http://www.geplac.ge/newfiles/GeorgianEconomicTrends/Cordonnier%202010.pdf>
- Country partnership strategy for Georgia FY2014 – FY2017. (2014). Report Number: 85251-GE. International Bank for Reconstruction and Development, International Development Association, International Finance Corporation.
- Davis I. (2009).The new normal. *McKinsey Quarterly*. Retrieved December 27, 2013 from http://www.mckinsey.com/insights/strategy/the_new_normal
- *Economic Growth in Georgia: Formidable Challenges and Effective policies for small business*. A guide for the policy review process and strategic plans for micro, small and medium enterprise development. (2004). OECD, UNIDO. Retrieved August 11, 2011 from <http://www.oecd.org/dataoecd/2/56/33926971.pdf>
- Enterprise Survey. Georgia: Country Profile (2013). International Financial Corporation/World Bank
- Fostering Entrepreneurship in Georgia. (2013). IBRD/ W B
- Georgia: Adjusting in the Face of Uncertainty (2014). World Bank. Georgia Economic Report No.5
- Georgia Rising Sustaining Rapid Economic Growth. Country Economic Memorandum. Report No. 79666-GE (2013). The World Bank. Retrieved September 5, 2014 from http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2013/08/01/000442464_20130801121128/Rendered/PDF/795320ESWOP127000PUBLIC00Box379794B.pdf
- Government of Georgia: Press Release 11 July, 2011. Retrieved June 21, 2011 from http://www.government.gov.ge/files/34_32576_148262_GEORGIAADOPTS_THEECONOMICLIBERTYACT.pdf
- Gross H. W. (2009). On the “Course” to a New Normal. INVESTMENT OUTLOOK. Retrieved September 7, 2014 from

<http://www.pimco.com/EN/Insights/Pages/Gross%20Sept%20On%20the%20Course%20to%20a%20New%20Normal.aspx>

- Kakulia, M. (October 2007). Challenges and Prospects of Economic Growth in Georgia. *Georgian Economic Trend*. p. 49-56
- Livny, E. (2009). The Liberty Act: An economist's comments. Investor.ge. Issue 6. Retrieved June 8, 2011 from http://www.investor.ge/issues/2009_6/06.htm
- Letter of development policy of the government of Georgia for the competitiveness and growth development policy operation. Prime Ministry of Georgia.
- Manyika J., Bughin J., Lund S., Nottebohm O., Poulter D., Jauch S., Ramaswamy S. Global flows in a digital age: How trade, finance, people, and data connect the world economy (2014). McKinsey Global Institute. Retrieved October 2, 2014 from http://www.mckinsey.com/insights/globalization/global_flows_in_a_digital_age
- National Bank of Georgia. Annual Report 2013. Tbilisi, Georgia
- Papiashvili, T. (2013). Georgia's Paradox: Growth without Employment. Proceedings of the First Mevlana (Rumi) University International Economics and Law Symposium. Mevlana University, Konya, Turkey, p.37-43.
- Samson, I. (February 2008). Medium-Term Prospects for the Georgian Economy. *Georgian Economic Trends*, p.63-77
- Shmidt, M. (January 2007). Foreign Direct Investment to Georgia: Can Active Investment Promotion Policies Make a Difference. *Georgian Economic Trends*, p. 63-71
- World data bank. Retrieved October 16, 2013 from <http://databank.worldbank.org/data/views/reports/tableview.aspx>
- World Economic Outlook. Recovery Strengthens, Remains Uneven. (April 2014). IMF. Retrieved October 1, 2014 from <http://www.imf.org/external/pubs/ft/weo/2014/01/pdf/text.pdf>
- World Bank. Georgia Overview (2014). Retrieved October 25, 2014 from <http://www.worldbank.org/en/country/georgia/overview>



EKC HYPOTHESIS AND THE EFFECT OF INNOVATION: A PANEL DATA ANALYSIS

DOI: 10.17261/Pressacademia.201519952

Billur ENGIN BALIN¹, H. Dilara MUMCU AKAN²

¹ Istanbul University, Turkey. E-mail: b.engin@istanbul.edu.tr

² Istanbul University, Turkey. E-mail: dimumcu@istanbul.edu.tr

Keywords:

Environmental Kuznets Curve,
Innovation,
Panel Data,
CO2 emissions

JEL Classification:

Q56, Q55, Q54, C23

ABSTRACT

In recent years, sustainable development has represented one of the most important aims of the economic policy explored in the environmental Kuznets curve (EKC) literature. The present paper contributes to this ongoing literature by comparing two different EKC specifications for 27 developed countries over the period 1997-2009 using panel data methods. It is found an N-shaped relationship between CO2 per capita and GDP per capita which differs from the traditional U-shaped EKC. The paper also examines the possible effects of innovative investments and industrial production on the environmental Kuznets curve (EKC) for CO2 emissions.

1. INTRODUCTION

The sustainability and environmental effects of economic growth have been examined remarkably since 1970's. In the renowned report of Rome Club "The Limits of Growth" (Meadows *et al.*, 1972); the increasing economic activity on the one hand requires more input and on the other hand creates more waste and here at it is argued that environmental quality would be decreased. This negative externality spread to the environment, especially would ruin the nonrenewable natural resource stock and after all threaten the economic activity herself. Accordingly, the Rome Club was referring that only if the economic growth is limited today the growth hereafter will proceed.

The doomy view of 70's, from 90's onwards was replaced with theoretic and empirical studies investigating the environmental effects of economic growth by linking the stages of development. The common of these studies are: at the early stages of development as economic growth increases the environment is more ruined solely in the proceeding stages of development the situation reverses. With the simplest definition Environmental Kuznets Curve Hypothesis¹ brings forward an inverted U shape relationship with income per capita and environmental damage. The hypothesis takes its footing from Simon Kuznets Nobel laureated study fulfilled in 1955 titled as "Economic Growth and Income

¹ As the issue in environmental economics literature is examined under the heading of "Environmental Kuznets Curve" in the residual part of this study the original abbreviation of the expression EKC will be used.

Inequality". In this study Kuznets defines the empirical relationship of mentioned variables as an "inverted-U relationship".

Thereby the EKC hypothesis does not consider the environmental degradation as a limit for environmental growth on the contrary claims that growth will resolve at least a part of this problem. Our aim is to investigate (i) whether the EKC relationship is well specified for CO₂ (ii) if there is a significant relationship between CO₂ emissions and innovative investments. Our models are estimated using panel data methods in order to control the heterogeneity and the colinearity among the variables (Baltagi, 2005). The remainder of this paper is organized as follows. Section 2 presents a brief literature review for the EKC Hypothesis. Section 3 describes the models and the source of data samples that is used in the models. Section 4 presents the empirical results of EKC effect of economic growth and innovative investments. Section 5 provides a brief conclusion.

2. LITERATURE REVIEW

EKC hypothesis elementarily exposes that environmental destruction is not a constraint for economic growth and supports sustainable development view. This hypothesis has been subject to many theoretical and empirical studies. Among these, three studies which have pioneering qualification can be mentioned as: Grossman and Krueger (1991, 1995), Shafik and Badyopadhyay (1992) and Panayotou (1993) who entitles the topic as EKC, in his studies with a numerous pollutant and gross domestic product there is an inverted U relationship.

Selden and Song (1994) argue that the inverted U shaped relationship between environmental quality and development would be formed with the impact of both demand and supply side influence. As it is viewed from demand side, the validity of EKC hypothesis is relevant with the environmental quality being accepted as luxury good whose income elasticity is greater than unit. (Beckerman, 1992; Carson *et al.*, 1997; Shafik, 1994). Yet as social welfare rises both the individuals are more disposed to use eco-friendly products and the authority is more pressurized for making regulations concerning preservation of environment. With the increasing per capita income the society's clean environment demand only in democratic societies will pressurize governments to perform active environmental policies. Therefore the feature of political system for the validity of EKC hypothesis is an important factor that we confront. (Bhattarai and Hammig , 2001; Shafik and Bandyopadhyay, 1992; Torras and Boyce , 1998).

When examined from supply side, it has been asserted by Grossman and Krueger (1995) that economic growth had an impact on environmental quality in three different channels. According to one of these channels "scale effect", as with the increasing economic activity, *ceteris paribus*, causes the increasing environmental degradation. Likewise the increasing production activity cause the resource consumption rate to mount on resource renewal ration besides waste production increases both in quantity and toxicity. In pursuit of the effect of scale emergent "composition effect" comprises the structural variations in economy with the increasing production. The significance in production shifted from manufacturing industry to knowledge intensive industries and service sector is an indicator of structural change; hence it can be told that this has environmental deductive effects.

Finally a rise in society's environmental consciousness both to refrain from the pollution created by environmental policies and an increase in the cost of eco-friendly technologies is entitled as "*technological effect*". In this context EKC hypothesis asserts, in the first phases of development when per capita income increases effect of scale is dominant; pollution per capita also increases conversely after a certain level of per capita income level due to composition and technological effects and being dominant over effects of scale, this trend will become reversed.

While the EKC hypothesis was being formed for the exigency of the hypothesis the independent variable was per capita income, as dependent variable the per person amounts of certain various pollutants was used. Mostly as a benchmark the usage of GDP per capita and occasionally real GNP can be perceived as a matter open to criticism. Barely in terms of the model's feasibility the components that effect income and development of political structure; education level, the composition of output are tackled and others with respect to the influence on income, and they prevent the model to become confusing.

As for pollutants many types of variables were used, particularly CO (carbon monoxide), CO₂ (Carbon dioxide), SO₂ (sulfur dioxide) and NO_x (nitrogen oxides) items that cause air pollution in the cities are more frequently used as independent variable. Many authors indicate the prime cause of this as the aforementioned variables existence for a long time period. Besides this, at a certain time period and forest zone change criteria as clean water amount per person, the heavy metals and toxic chemicals present in water, the amount of undissolved oxygen for the necessity of organic life in rivers and other criteria have been used concerning environmental quality.

Some extended versions of the EKC have been proposed with the aim of including factors such as technology impacts, energy consumption, energy prices, labor, trade-related factors, environmental regulation or policy, and environmental concerns (Ayres and Van den Bergh, 2005; Dasgupta *et al.*, 2006; Halicioglu, 2009; Lantz and Feng, 2006). Nevertheless few attempts have been made in order to consider the effect of innovation. He and Jiang (2012) compared the two groups of samples, which described energy consumption per unit of industrial added value, each group contains five symbolic provinces or municipalities in coastal and western areas. They found the positive significance effect of the technological innovation. Huang (2011) analyzed the internal relationship between Porter Hypothesis and Environmental Kuznets Curve and concluded that the progress of Porter Hypothesis² also relies on economic growth, which is compatible with EKC. By giving the central role of technological progress in long-term environmental problems, Baiardi (2013) empirically investigated the influence of innovation on the EKC and found that innovation influences the EKC directly and indirectly, given its close relationship with income.

² Porter hypothesis suggests that strict environmental regulation triggers the innovation and introduction of cleaner technologies and environmental improvements, the innovation effect, making production processes and products more efficient. (Porter and van der Linde, 1995)

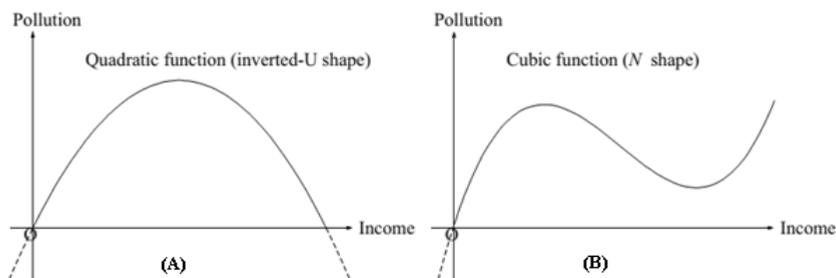
3. DATA SOURCES AND MODELS

In most of the studies making query for the validity of EKC hypothesis in terms of certain pollutants are based on the reduced model below:

$$E_{it} = \beta_0 + \beta_1 X_{it} + \beta_2 X_{it}^2 + \beta_3 X_{it}^3 + \beta_4 Z_{it} + e_{it} \quad (1)$$

In this equation E_{it} denotes pollutant amount in region/country "i" at time period "t", X_{it} denotes GDP per capita in region "i" at time period "t"³. Z_{it} stands for the other related variables. With regard to this model, (i) when $\beta_2 = \beta_3 = 0$ and $\beta_1 > 0$, we can say there is a continuously increasing relationship between income per capita and pollution per capita. (ii) If $\beta_1 < 0$, $\beta_2 > 0$ ve $\beta_3 = 0$; the model will transform into quadratic form. In accordance with EKC hypothesis it can be granted an inverted U shape relationship between per capita income and pollution per capita (Figure 1-A), (iii) finally in a cubic form model if $\beta_1 > 0$, $\beta_2 < 0$ ve $\beta_3 > 0$; we can talk about an N-shaped relationship (Figure 1-B). Other possibilities concerning the significance of parameters are not within the scope of EKC literature.

Figure 1: Quadratic and cubic functions for the estimation of the EKC Hypothesis



In the empirical EKC literature, presented the N-shaped scenario, in which economic growth provides to environmental recovery initially, yet it generates more severe environmental degradation beyond a certain income level. (Panayotou, 1993; Moomaw and Unruh, 1997; Bryun and Opschoor, 1997, Akbostanci *et al.*, 2009) Dasgupta *et al.* (2002) argued that the slope or form of the curve may take various shapes according to the type of pollutant and context of pollution. Although EKC hypothesis implies that doing nothing is the best policy because as income increases the pollution problem will be solved automatically, empirical studies offer very little support for the strong policy conclusion that economic growth alone is the solution to all environmental problems. The empirical studies on EKC Hypothesis can be grouped under three titles: cross-country studies (Grossman and Krueger, 1995; Shafik, 1994; Stern *et al.*, 1996), time series analysis (Egli, 2002; Vincent, 1997) and panel data analysis (Dijkgraaf and Vollebergh 1998, 2001; de Bruyn *et al.*, 1998; Wagner, 2008; Torras and Boyce, 1998; Panayotou *et al.*, 2000).

³ It has seen that according to the studies based on reduced model, the lagging indicators of per capita income are used. (Bradford *et al.*, 2005; Coondoo and Dinda, 2002; Grossman and Krueger, 1995; Perman and Stern, 2003).

Our empirical analysis exploits a balanced panel of annual observations and covers 27 countries⁴, chosen on the basis of their development level and share in the total world CO₂ emissions, over a 13-year period (1997–2009). 25 of the sample countries are in the high human development classification in the Human Development Index within the related time period. In addition, according to the Human Development Report 2007/2008, these countries are responsible for approximately 65% of the total CO₂ emissions in the world. The dataset consists of 351 observations for each variable of the each panel. All the data was provided from the Worldbank Open Data (data.worldbank.org).

In our analysis, we focus on CO₂ emissions per capita (in metric tons), which are viewed to be the most important global pollutant contributing about 72% of the global warming effects. For the independent variables real GDP per capita at year 2005 constant prices was used. Moreover, patent applications of residents, research and development expenditures (as a percentage of GDP) and value added industrial production were adopted as additional independent variables. Patent applications and research and development expenditures were used as proxy of innovative activity. Value added industrial production (as a percentage of GDP) is added to the model because an important part of the CO₂ emission is sourced by industrial production.

As it was explained before, the EKC hypothesis assumes that as income increases, public consciousness and eco-friendly behavior rises, and as technology advances, emission of pollutants per unit of production decreases. Therefore, it can be expected beyond a certain income level, environmental pollution is diminished. However some theoretical and empirical studies presented the N-shaped scenario which proposes that increasing GDP per capita provides environmental recovery initially, but the level of environmental degradation is getting worse beyond a certain income level. Within this scope, hypothesis 1 and 2 of this study examine what kind of relationship exists between CO₂ emission, and economic growth:

Hypothesis 1. Emission of CO₂ will have a statistically significant relationship with GDP, showing an inverted U-shaped curve.

Hypothesis 2. Emission of CO₂ will have a statistically significant relationship with GDP, showing an N-shaped curve

Baltagi (2005) states that the fixed effects model (FEM) is an appropriate specification if the observations focus on a specific set of N firms, countries or states which are under similar conditions while the random effects model (REM) is an appropriate specification if the observations are drawn randomly from a large population. From this point of view FEM would be a better choice than the REM since we are interested in estimating the relationship between CO₂ emissions, GDP per capita and innovation level for the predetermined selections of countries. We have checked these two alternative specifications using the Hausman test, and the choice of the FEM is supported by the data.

⁴ Austria, Belgium, Bulgaria, Canada, China, Czech Republic, Denmark, Finland, France, Germany, Hungary, Japan, Republic of Korea, Lithuania, Mexico, Netherlands, Poland, Portugal, Romania, Russian Federation, Singapore, Slovak Republic, Slovenia, Spain, Turkey, United Kingdom, United States.

In order to investigate the most appropriate model of EKC between the inverted U-shaped scenario and the N-shaped scenario, this study puts forward two specifications for the emission of CO2 per capita as follows:

Model 1. $CO2_{it} = \beta_0 + \beta_1GDP_{it} + \beta_2GDP_{it}^2 + \beta_4patent_{it} + \beta_5r\&d_{it} + \beta_6industry_{it} + \mu_i + u_{it}$ (2)

Model 2. $CO2_{it} = \beta_0 + \beta_1GDP_{it} + \beta_2GDP_{it}^2 + \beta_3GDP_{it}^3 + \beta_4patent_{it} + \beta_5r\&d_{it} + \beta_6industry_{it} + \mu_i + u_{it}$ (3)

where i represents the countries and t is the year, $CO2_{it}$ denotes CO2 emission per capita, GDP_{it} denotes GDP per capita (constant 2005 USD), $patent_{it}$ is the patent applications of the residents, $r\&d_{it}$ is the research and development expenditures as a percentage of GDP, $industry_{it}$ is the value added industrial production as a percentage of GDP. β_0 stands for the specific country-pair effects and allows to control for all omitted variables that are cross-sectionally specific but remain constant over time. μ_i denotes the unobservable country-specific effect and u_{it} denotes the remainder disturbance.

For Model 1, if significant parameters satisfy $\beta_1 > 0$ and $\beta_2 < 0$, then an inverted-U relationship exist. For Model 2, if significant parameters satisfy $\beta_1 > 0$ and $\beta_2 < 0$ and $\beta_3 > 0$, then there exist an N-shaped relationship. For both models expected value for β_4 and β_5 are negative due to the positive effect of innovative investments on clean environment. Expected value of β_6 is positive because industrial production is assumed as one of the main components of the CO2 emissions.

4. EMPIRICAL RESULTS

The results of descriptive statistics on variables are summarized in Table 1. The number of valid observations is 351, and the average emission volume of CO2 is 8.59 tons.

Table1: Descriptive Statistics

Variable	Min	Max	Mean	Std. Dev.
CO2 (metric tons per capita)	2.65	20.25	8.59	3.79
GDP per capita (constant 2005 USD)	916.20	49554.91	21429.86	14034.94
Patent Applications of Residents	62.00	384201.00	31283.46	77138.78
R&D Expenditures (% of GDP)	0.34	3.93	1.57	0.90
Industry (% of GDP)	19.06	47.95	30.79	5.57

The model is tested for heteroskedasticity, cross-sectional dependence and serial correlation. Modified Wald test represented the existence of heteroskedasticity. Pesaran, Friedman and Frees tests proved the cross-sectional dependence in the panel.

Both Baltagi-Wu local best invariant (LBI) test and Durbin-Watson test indicated the existence of serial correlation. The results given in the Table 1 are the robust coefficients that are adjusted by Driscoll-Kraay estimator.

Table2: Panel-data Regression Results

	Model 1		Model 2	
GDP_{it}	0.0000645	(-0.0000357)	0.000229*	(8.11E-05)
GDP_{it}^2	-2.14E-09*	(3.78E-10)	-1.08E-08*	(3.72E-09)
GDP_{it}^3	-	-	1.16E-13**	(4.78E-14)
$patent_{it}$	0.0000135*	(1.38E-06)	1.25E-05*	(1.50E-06)
$r\&d_{it}$	-0.4752772**	(0.1926033)	-0.425550**	(0.200446)
$industry_{it}$	0.1011806*	(0.0342938)	0.091599*	(0.030564)
<i>Constant</i>	5.7863530*	(1.2024000)	5.556494*	(1.180927)
	R^2	0.1924	R^2	0.201
	$F(5,26)$	355.58	$F(6,26)$	619.45
	$Prob>F$	0	$Prob>F$	0

Note: Robust standard errors are represented in parentheses. Coefficients with (*) are significant at 1% ; (**) are significant at 5%. Coefficients in bold are not significant at standard levels.

Both the Model 1 and 2 of the fixed effects model are found significant by F-test. Signs of coefficients for GDP variables are just as expected before and R^2 values are quite similar for both models. However in Model 1 β_1 is found insignificant for standard levels. Thus, for CO2 emissions, Model 2 reports of the existence of an N-shaped EKC represented by GDP per capita. The turning points of the estimated model are calculated as \$13575 and \$48493. Therefore, we can say that in the selected countries that have per capita GDP approximately less than \$13575, CO2 emissions tends to increase as GDP per capita increases. However, for the selected countries those have per capita incomes ranging approximately between \$13575 and \$48493 CO2 emissions decline. It can be argued that, through the development process as per capita GDP of selected countries increase beyond \$48493 level, CO2 emissions is expected to rise once again.

On the other hand, Model 2 reports that research and development expenditures is negatively associated with emissions of CO₂, while patent applications and industrial production are positively related to CO₂ emissions. We have chosen research and development expenditures and patent applications as proxy of innovative investments. Research and development expenditures are negatively related to the CO₂ emissions as it is expected. Surprisingly, our model put forwards that patent applications have a positive significant relationship with CO₂ emissions. However it must be emphasized that the coefficient of patent applications (β_4) is minor in comparison with the other control variables. This unexpected result can be explained by the nature of the patent data that is used in the model. The available data contains all the patent applications of the residents, not only environmental patents. Additionally CO₂ emissions rises along with the growth in the industrial production which coincide with the common sense that industrial activity are one of the major contributors to CO₂ emission.

5. CONCLUSION

In order to investigate the relationship between per capita GDP and CO₂ emissions, this study examined an EKC hypothesis empirically as it applied to 27 developed countries from 1997 through 2009. Moreover, it is attempted to test the existence of various scenarios related to the shape of EKC and analyzed the impact of innovative investments and industrial production which is recognized to be one of the main causes of the greenhouse gas emissions.

According to our empirical results, we assert that there is an N-shaped relationship between per capita GDP and CO₂ with the turning points \$13575 and \$48493 respectively. The finding of N-shaped relationship for CO₂ emissions and GDP per capita in our analysis implies that the EKC hypothesis is not supported by this data set. EKC hypothesis implies that persistent development is the best policy because as income increases the level of pollution will decrease eventually. Nevertheless some economists state that EKC is the argument of the mainstream economists who defend growth through more liberalized world markets. Therefore, one of the most important conclusions of our study is that actions against the environmental problems cannot wait until per capita GDP rise. Findings of this study represents that CO₂ emissions will not disappear automatically with economic growth, on the contrary it can be more severe after a certain level of GDP per capita.

On the other hand, it is found that research and development expenditures and industrial production are the other significant variables in explaining CO₂ emissions. As consistent with the ongoing literature, innovation influences CO₂ emissions directly and indirectly given its close relationship with income. In addition, based on the positive significant relationship between industrial production and CO₂ emissions, more eco-friendly industrial process should be encouraged.

REFERENCES

- Akbostanci, E. – S. Turut-Asik and G. I. Tunc (2009), “*The Relationship between Income and Environment in Turkey: Is There an Environmental Kuznets Curve?*”, **Energy Policy**, 37 (3), pp. 861–867
- Ayres, R. U. and J. Van den Bergh (2005), “*A Theory of Economic Growth with Material/Energy Resources and Dematerialization: Interaction of Three Growth Mechanisms*”, **Ecological Economics**, 55(1), pp. 96–118.
- Baiardi, D. (2014), “*Technological Progress and the Environmental Kuznets Curve in the Twenty Regions of Italy*”, **The B. E. Journal of Economic Analysis and Policy**, 14(4), pp. 1501-1542.
- Baltagi, B. H. (2005), **Econometric Analysis of Panel Data**, 3rd ed., John Wiley and Sons.
- Beckerman, W. (1992), “*Economic Growth and the Environment: Whose Growth? Whose Environment*”, **World Development**, 20, pp. 481-496.
- Bhattarai, M. and M Hammig (2001), “*Institutions and the Environmental Kuznets Curve for Deforestation: A Cross-Country Analysis for Latin America, Africa, and Asia*”, **World Development**, 29(6), pp. 995 – 1010.
- Bradford D. F. – R. A. Fender – S. H. Shore and M. Wagner (2005), “*The Environmental Kuznets Curve: Exploring a Fresh Specification*”, **The B. E. Journal of Economic Analysis and Policy**, 4(1).
- Bruyn, S. M. and J. B. Opschoor (1997), “*Development in the Throughput–Income Relationship: Theoretical and Empirical Observation*”, **Ecological Economics**, 20(3), pp. 255–268.
- Carson, R.T. – Y. Jeon and D. R. McCubbin (1997), “*The Relationship between Air Pollution Emissions and Income: US Data*”, **Environment and Development Economics**, 2(4), pp. 433-450.
- Coondoo, D. and S. Dinda (2002), “*Causality between Income and Emission: A Country Group-Specific Econometric Analysis*”, **Ecological Economics**, 40(3), pp. 351–367.
- Dasgupta, S. – B. Laplante – H. Wang and D. Wheeler (2002), “*Confronting the Environmental Kuznets Curve*”, **The Journal of Economic Perspectives**, 16(1), pp. 147–168
- Dasgupta, S. – K. Hamilton – K. D. Pandey and D. Wheeler (2006), “*Environment During Growth: Accounting for Governance and Vulnerability*”, **World Development**, 34(9), pp. 1597–1611.
- De Bruyn, S.M. – J. C. J. M. Van Den Bergh and J. B. Opschoor (1998), “*Economic Growth and Emissions: Reconsidering the Empirical Basis of Environmental Kuznets Curves*”, **Ecological Economics**, 25(2), pp. 161 – 175
- Dijkgraaf, E. and H. R. S. Vollebergh (1998), “*Growth and Environment—Is There a Kuznets Curve for Carbon Emissions?*”, **2nd ESEE conference**, University of Geneva.

- Dijkgraaf, E. and H. R. S. Vollebergh (2001), "A Note on Testing for Environmental Kuznets Curves with Panel Data", **FEEM Working Paper**, No: 63.
- Egli, H. (2002), "Are Cross-Country Studies of the Environmental Kuznets Curve Misleading? New Evidence From Time Series Data or Germany", **FEEM Working Paper**, No: 25.
- Grossman, G.M. and A. B. Kruger (1991), "Environmental Impacts of the North American Free Trade Agreement", **NBER Working Paper**, No: 3914.
- Grossman, G.M. and A.B. Krueger (1995), "Economic Growth and the Environment", **Quarterly Journal of Economics**, 110 (2), pp. 353–377.
- Halicioglu, F. (2009), "An Econometric Study of CO₂emissions, Energy Consumption, Income and Foreign Trade in Turkey", **Energy Policy**, 37(3), pp. 1156–1164.
- He, Y. W and J. R. Jiang (2012), "Technology Innovation Based on Environmental Kuznets Curve Hypothesis", **Advance Material Research**, 573-574, pp. 831-835.
- Huang, D. R (2011), "Study on the Internal Relationship between Porter Hypothesis and Environmental Kuznets Curve", **Science and Technology Information**, 27.
- Kuznets, S. (1955), "Economic Growth and Income Inequality", **American Economic Review**, 45 (1), pp. 1–28.
- Lantz, V. and Q. Feng (2006), "Assessing Income, Population, and Technology Impacts On CO₂ Emissions in Canada: Where's The EKC?", **Ecological Economics**, 57(2), pp. 229–238.
- Meadows, D. H. – D. L. Meadows – J. Randers and W.W. Behrens (1972), **The Limits to Growth**, New York University Books.
- Moomaw, W. R. and G. C. Unruh (1997), "Are Environmental Kuznets Curves Misleading Us? The Case of CO₂emissions", **Environment and Development Economics**, 2(4), pp. 451–463.
- Panayotou, T. (1993), "Empirical Tests and Policy Analysis of Environmental Degradation at Different Stages of Economic Development", **ILO Technology and Employment Program Working Paper**, No: WP238.
- Panayotou, T. – A. Peterson and J. Sachs (2000), "Is the Environmental Kuznets Curve Driven by Structural Change? What Extended Time Series May Imply for Developing Countries?", **CAER II Discussion Paper**, No:80.
- Perman, R. and D. I. Stern (2003), "Evidence from Panel Unit Root and Co-integration Tests that the Environmental Kuznets Curve Does Not Exist", **Australian Journal of Agricultural and Resource Economics**, 47(3), pp. 325–347.
- Porter, M. E. and van der Linde, C., (1995), "Toward a New Conception of the Environment-Competitiveness Relationship", **Journal of Economic Perspectives**, 9 (4), pp. 97-118.

- Selden, T.M. and D. Song (1994), “*Environmental Quality And Development: Is There A Kuznets Curve for Air Pollution Emissions?*”, **Journal of Environmental Economics and Management**, 27 (2), pp. 147–162.
- Shafik, N. and S. Bandyopadhyay (1992), “*Economic Growth and Environmental Quality: Time Series and Cross-Country Evidence*”, **Background Paper for World Development Report 1992**, World Bank, Washington DC.
- Shafik, N. (1994), “*Economic Development and Environmental Quality: An Econometric Analysis*”, **Oxford Economic Papers**, 46, pp. 757 – 773.
- Stern, D.I. – M. S Common and E. B. Barbier (1996), “*Economic Growth and Environmental Degradation: The Environmental Kuznets Curve and Sustainable Development*”, **World Development**, 24(7), pp. 1151–1160.
- Torras, M. and J. K. Boyce (1998), “*Income, Inequality, and Pollution: A Reassessment of the Environmental Kuznets Curve*”, **Ecological Economics**, 25(2), pp. 147 – 160.
- Wagner, M., and G. Müller-Fürstenberger (2008), “*The Carbon Kuznets Curve: A Cloudy Picture Emitted by Bad Econometrics?*”, **Resource and Energy Economics**, 30(3), pp. 388-408.
- Vincent, J.R. (1997), “*Testing for Environmental Kuznets Curves within a Developing Country*”, **Environment and Development Economics**, 2(4), pp. 417 – 431.



ENTREPRENEURIAL ORIENTATION, STRATEGIC IMPROVISATION, TALENT MANAGEMENT AND FIRM PERFORMANCE

DOI: [10.17261/Pressacademia.201519953](https://doi.org/10.17261/Pressacademia.201519953)

Hartini AHMAD¹, Darwina ARSHAD², Leonis MARCHALINA³

¹Universiti Utara Malaysia. E-mail: hartini@uum.edu.my

²Universiti Utara Malaysia.

³Universiti Utara Malaysia. E-mail: leonismarchalina@gmail.com

Keywords:

entrepreneurial orientation,
strategic improvisation,
talent management,
performance,
Government-Linked companies

JEL Classification:

ABSTRACT

The Malaysian Government has acquired a large shareholding in several Malaysian companies to meet national aspirations, social concerns and global challenges. Known as 'Government-Linked Companies' or GLCs, have a part in ensuring Malaysia to achieve its ambition of becoming a developed country by the year of 2020. For the GLCs to sustain in the industry it is operated, it has to find ways to optimize the best practices such as in entrepreneurial orientation, strategic improvisation and talent management that can improve its organization competencies, particularly the performance. The sample includes all of the twenty six (26) public listed companies of the GLCs in Malaysia. The study uses a structured questionnaires to collect the data from the firms meeting the criteria of government linked companies or GLCs, the disproportionate sampling technique employed is to choose 5 executives from each company, making a total of 520 respondents. Results showed all hypotheses were supported; therefore, GLCs should ensure the favorable results to give the right priority to the implementation of the best practices in order to improve organizational performance.

1. INTRODUCTION

As the new venture development process unfolds, organisations typically need to change course from their original plans, remain flexible, become more entrepreneurial orientated and continually evolve their business (Mullins and Komisar, 2009). As a result, entrepreneurs must be able to formulate and execute novel strategic decisions in the moment (i.e., improvise)—so as to capitalize on opportunities to move their firm in a more promising direction. Entrepreneurial orientation (EO) as one of intangible resources (styles of thinking) has a willingness to explore new ideas and markets and attempts to destroy the market leader position by discovering new markets (Janney & Dess, 2006). EO mostly focused on finding and proactively exploiting opportunity through innovation.

Likewise improvisational activity in recent years has emerged as being critically important in the business arena. Improvisation enables managers to continually learn while working and act spontaneously and creatively to consistently move products and services out of the door (Brown & Eisenhardt, 1997). It can potentially generate value to the company in terms of prudent change management, adjustability to adopt best practices as well as adding flexibility and innovation (Leybourne, 2006). By practicing improvisation, organizations could gain a better understanding on how individual and groups in organizations cope with and coordinate the conflicting demands of existing time perspectives (Crossan, Pina e Cunha, Vera, & Cunha, 2005); learn and adapt under time pressures (Vera & Crossan, 2005); and remain flexible under turbulent environments (Cunha, Cunha, & Kamoche, 1999).

Since a group of McKinsey consultants coined the phrase the War for Talent in 1997 (see Axelrod et al., 2002), the topic of talent management has received a remarkable degree of practitioner and academic interest. People though belong to diverse backgrounds therefore possess diverse talents. So, this is an organization's responsibility to effectively manage the talent of its workforce to achieve better business performance. As defined by Tansley (2011), a high potential employee is someone with the ability, engagement and aspiration to rise to and succeed in more senior, more critical positions in order to be considered as high potential and it should have a critical skill set which has become difficult to be obtained in the labor market.

The Malaysian Government has acquired a large shareholding in several Malaysian companies to meet national aspirations, social concerns and global challenges (Viotor, 2007). Known as 'Government-Linked Companies' or GLCs (Ang & Ding, 2006), they play a vital role in the country's economy. GLCs undoubtedly have been a major element in Malaysia's economic development, and need to be sustained as Ting & Lean (2011) stated that the need for the future study to look into the sustainability issue in the GLC in a more holistic way. Despite the government's intervention, a number of them continued to underperform as reflected by key financial and operational indicators, and became a financial burden to the government (Musa, 2007). As such the study will examines how entrepreneurial orientation, strategic improvisation, talent management of GLCs's top management team can affect firm performance.

2. LITERATURE REVIEW

2.1. Firm Performance

Superior performance is usually based on developing a competitively distinct set of resources and deploying them in a well-conceived strategy (Fahy, 2000). Indeed, strategists who embrace the Resource-Based View (RBV) also point out that competitive advantage comes from aligning skills, motives, etc. with organizational systems, structures and processes that achieve capabilities at the organizational level (Salaman et al., 2005). Firms with a bundle of resources that are valuable, rare, inimitable and non-substitutable can implement value-creating strategies that are not easily duplicated by other firms (Barney, 1991). However, it is quite difficult to find a resource, which satisfies the entire VRIO or Valuable, Rarity, Imitability, and Organization criterion (Barney, 1991), except in a monopolistic type of company. VRIO concept is important in a company for indentifying the valuable resources and the performances of RBV in a company (Andersén, 2011).

VRIO is a superior financial performance that are valuable, rare, and hard to imitate and have an organizational orientation that is attributed by RBV theory (Barney, 2002). VRIO was being studied to analyze competitive advantage (O'Sullivan and Bella, 2007; Andersén, 2011) and to discover the hidden capabilities and resources within the firm performance (Lin et al., 2012).

Firm performance using RBV can be classified into financial (accounting-based measures such as cash in hand at bank, profitability, sales growth, etc.) and non-financial (market share, new product introduction, product quality, marketing effectiveness or manufacturing value-added) (Kapelko, 2006). Profitability and sales growth is the most common measure of performance (Doyle, 1994). An effective firm performance measurement system ought to cover more than just financial measures (O'Regan & Ghobadian, 2004). Recently, researchers have introduced several non-financial determinants of firm performance and the relative positioning of the firms against the leading competitor (Alegre et al., 2006). This type of measurement is becoming popular to overcome the limitation of financial measurements, such as a high probability of low response rate due to confidential data etc.

2.2. Entrepreneurial Orientation

Firms with high EO can target premium market segments, charge high prices and “skim” the market ahead of competitors, which should provide them with larger profits and allow them to expand faster (Zahra & Covin, 1995). The relationship between the EO construct and non-financial goals, such as increasing the satisfaction of the owner of the firm, is less straightforward. Most researchers argue that there is little direct effect of EO on non-financial goals. Satisfaction may increase because of better financial firm performance. However, indirect effects are usually smaller than direct effects. Therefore, it appears reasonable to assume that the relationship should be higher for EO.

In addition, previous research suggests that every dimension has a positive influence on performance (McGrath, 2001). SMEs, which are innovative, can create new products and technologies, which generate unexpected economic firm performance, whereby proactive SMEs can create competitive advantage that dominates the market. On the other hand, the influence of risk taking and firm performance is still questionable as the result of a company's performance are varied while taking risky strategies (March, 1991).

H1: Entrepreneurial Orientation (EO) has significant positive relationship with performance

2.3. Strategic Improvisation

Prior research has paid considerable attention on the centrality of improvisation in individual and group outcomes (Kamoche et al., 2003) to the detriment of focus on organizational outcomes (firm performance). For instance, Moorman and Miner (1998) and Vera and Crossan (2005) study new product development as an improvisational outcome; Leybourne and Sadler-Smith (2006) investigates internal and external project outcomes; Souchon and Hughes (2007) focus on export performance as an outcome of export improvisation; while Hmieleski and Corbett (2008) examine venture performance as an outcome of entrepreneurial improvisational behavior. This relationship between improvisation and organizational outcomes has appeared to be dubious in extant research and lacks empirical examination (see Vera & Crossan, 2005; Hmieleski & Corbett, 2008).

Interestingly, no study has sought to trace and prove the association between organizational improvisation and firm performance in GLCs, although many previous researchers tend to assume that improvisation may lead to superior performance through the secondary benefits of contingent factors such as flexibility (Crossan et al., 2005), self-efficacy (Hmieleski & Corbett, 2008), and management of environmental turbulence. By noting this deficiency in the investigation of strategic improvisation in GLCs, this research seeks to provide additional contributions to existing theory and practitioners.

H2: Strategic Improvisation (SI) has significant positive relationship with performance

2.4. Talent Management

The ability to attract, develop and retain talent determines the strategic capability of organizations. The talent of the leadership within organizations is a break factor in the achievement of strategic goals and the incremental value of the best managers. Prior to that, many organizations are now realizing that attracting, growing and retaining top management talent is a strategic issue. Gagne (2000) suggests that talented people have the ability to perform an activity to a degree that places their achievement within at least the upper 10 percent of their peers who are active in that field.

Additionally, Goleman (2006) noted that in professional jobs, top performers who were capable of adding value to their organization are worth ten times as much as their co-workers. Thus, the strong human resource practices have been systematically associated with personnel measures (e.g. turnover as well as organizational performance was measured by objective (Huselid, 1995) and subjective criteria (Singh, 2004).

According to Tansley (2011), successful performance can also be linked to other characteristics most frequently associated with talented individuals, such as: high levels of expertise; leadership behaviors; creativity; and Initiative stemming from a "can do attitude" based on self-belief. The levels of performance required from individual talent will naturally depend on the needs of the organization and the nature of the work. For example, in the GLCs, organizations in this sector may see talented individuals as those who demonstrate high performance in leadership behaviors by those who draw upon high levels of expertise in a specialist area. Many talent management measures are one-source self-reports that make it difficult to specify the magnitude of the HR practice/outcome and there is controversy regarding the organizational level at which HR effectiveness criterion data should be collected (Gerhart et al., 2002 & Gerhart et al., 2000).

H3: Talent Management (TM) has significant positive relationship with performance

3. METHODOLOGY AND DATA

The sample includes all of the twenty six (26) public listed companies of the GLCs in Malaysia. The present study uses a structured questionnaires to collect the data from the respondents and in constructing the instrument items of the questionnaires, an attempt was made to include questions only if they were necessary in achieving the research objectives. The measurement used for the variables in this study was adapted from the previous studies as stated in table 1. The respondents in this study were the employees from various hierarchical levels, including the top level, middle level and operational level. It is based on the authority of making decisions of each level.

Each respondent received a copy of the questionnaire personally (face to face), hence to ensure the highest possible response rate (Zikmund, 2003). The cover letter gave a clear explanation of the purpose behind the research, assuring the respondent anonymity, and an offer to send a copy of a summary of the findings to those who are interested. The questionnaire used a letter head that stated any information provided will be treated with strictest confidential and would be used only for academic purposes.

In order to addresses each of the stated hypotheses in the literature review, a regression analysis was performed to assess the direct and indirect relationships within the proposed model and the stated hypotheses.

$$P_{it} = \alpha_0 + \beta_1EO_{it} + \beta_2SI_{it} + \beta_3TM_{it} + \mu_t \dots\dots\dots(1)$$

Where: where i refers to firm, t refers to time, and P is the firm performance, α refers to estimated constant, EO is firm’s entrepreneurship orientation, SI is firm’s strategic Improvisation, TM is firm’s talent management and μ is the standard error.

Table 1: The Survey Items Constructed

Section	Title	Number of Items	Authors
A	<i>(i) Measures of Independent Variables</i>		
	Entrepreneurial Orientation	9	Covin and Slevin (1989).
	Strategic Improvisation (Operation Strategy)	7+11	Jambekar (2007); Skinner (1969); Oltra and Flor (2010).
	Talent Management	7	Pruis (1989).
B	<i>(ii) Measures of Dependent Variables</i>		
	Firm Performance (Operational Excellence: cost, quality, time, flexibility, social responsibility,enviromental)	9+23	Dess and Robinson (1984); Gupta and Govindarajan (1984); Laugen, et al. (2005); Hubbard (2009); Kuruppuarachchi & Perera (2010).

4. FINDINGS AND DISCUSSION

4.1. Test of Early and Late Responses

According to Armstrong and Overton (1977), firms that respond later are theoretically more similar to non-respondents. This argument is the late respondent would not have probably responded other than they had been extensively given follow up approach. To rule out that non-response bias is a critical concern for this study, a non-response bias test is carried out with the late respondents being used as proxy for non-respondents. During the analysis, T-test was conducted for all variables related in this study. Results from the T-test are shown in Table 2, shows that there is no statistically significant differences at the 0.05 level for any of the characteristics by the two groups, early respondents and late respondents. Therefore, the researcher assumes that non-response bias is not a critical concern for this study.

Table 2: The T-test Result between Early and Late Respondents

	Response Bias	N	Mean	Std. Deviation	Std. Error Mean	T-value	Significance
Entrepreneurial Orientation	Early	141	3.7063	.59329	.07596	-.663	.181
	Late	140	3.7736	.52145	.06732		
Strategic Improvisation	Early	141	3.8823	.40566	.05194	-.309	.608
	Late	140	3.9045	.38621	.04986		
Talent Management	Early	141	3.7309	.51108	.06544	.652	.880
	Late	140	3.7847	.45393	.05860		
Firm Performance	Early	61	3.6972	.52335	.06701	-.865	.298
	Late	60	3.7741	.45250	.05842		

4.2. Descriptive Statistics

The means and standard deviation of in the entrepreneurial orientation constructs are displayed in Table 3. Mean scores are computed by equally weighting the mean scores of all items. On a five-point scale, the mean scores of the items of entrepreneurial orientation are from the highest of 4.2633 with the lowest of 3.5836. The standard deviation ranged from 0.68587 to .95082.

The mean score for the EO construct can be classified as high. According to Mahmood and Rahman (2007), and Mahmood (2005), a mean rating value of 4.21 and above are classified as very high, a mean rating value of between 3.41 and 4.20 as high, and a mean rating of 3.41 and below as moderate.

Table 3: Means of Entrepreneurial Orientation

No.	Statement	Mean	SD
1	Our organization searches new technologies, processes, techniques, and/or product idea	4.2633	.73317
2	Our organization generates creative ideas	4.0676	.68587
3	Our organization promotes and champions new ideas to others	3.8821	.84053
4	Our organization investigates and secures funds needed to implement new ideas	3.8327	.95082
5	Top management is an innovative problem solver	3.7544	.75606
6	Our organization believes in something to make it happen, no matter what the odds	3.8826	.77718
7	Our organization loves being a champion for our ideas, even against others' opposition	3.7544	.86201
8	Our organization spots a business opportunity long before others can	3.7046	.86702
9	Top management prefers the risky business option	3.5836	.89500

The means and standard deviations of all items of strategic improvisation are shown in Table 4. All the items were measured on a five point scale. The mean scores for SI ranged from 3.7651 to 3.9609 giving an overall mean of 3.8607. This shows that the degree of strategic improvisation among the GLCs was relatively high.

Table 4: Means of Strategic Improvisation

No.	Statement	Mean	SD
1	Top management responds in the moment to unexpected problems	3.7758	.75799
2	Top management identifies opportunities for new work process	3.9181	.78631
3	Top management explores a wide variety of approaches to a problem	3.8399	.86560
4.	Top management creates multiple courses of action during planning	3.8221	.75381
5	Top management maintains productivity in challenging circumstances	3.9609	.74299
6.	A top management team adopts the company strategy adequately to changes in the organization's business environment	3.9431	.75850
7	Top management believes that their initial impressions of situations are almost always right	3.7651	.70836

The means and standard deviations of all items of talent management are shown in Table 5. All the items were measured on a five point scale. The mean scores for TM ranged from 3.7224 to 3.9609 giving an overall mean of 3.8331. This shows that the degree of talent management among the GLCs was relatively high.

Table 5: Means of Talent Management

No.	Statement	Mean	SD
1	Top management views workforce effectiveness as important in delivering business results	3.9609	.79859
2	Our organization has a workforce management strategy that is explicitly linked to the overall business strategy	3.8719	.85646
3	Our organization understands and addresses workforce attitudes	3.8221	.77714
4	Metrics are used to provide input into strategic workforce planning decisions	3.7419	.82979
5	Our organization attracts, retains, values, and fully utilizes a diverse workforce	3.7224	.90307
6	Our organization identifies high potential and key employees and had programs to retain them	3.8256	.96816
7	Our organization has a succession management capability that guides the development of leadership talent	3.8221	.90060

The means and standard deviations of all items for firm performance are shown in Table 6. All items were measured on a five-point scale. The mean scores for performance ranged from 3.79 to 4.08, giving an overall mean of 3.94. This shows that the performance of the banks was relatively high for the past three years.

Table 6: Means of Performance

No	Statement	Importance		Satisfaction	
		Mean	SD	Mean	SD
1	Return on investment	4.4892	.754	3.8869	.9007
2	Net profit	4.5396	.8262	3.8768	.9757
3	Control of operational expenses	4.446	.7664	3.8102	.9457
4	Market share	4.2336	.8366	3.7044	.9666
5	Product/service cycle time	4.2873	.7744	3.7491	.8364
6	Customer service level	4.5	.7683	3.9638	.826
7	Inventory levels	4.1691	.8646	3.7194	.9272
8	Resource utilization	4.2996	.86	3.7527	.9134
9	Sales growth	4.4604	.7625	3.8561	.9134
10	Sales volume	4.4712	.739	3.9532	.9238

4.3. Regressions Analysis

In the multiple regression analysis, the dependent variable of firm performance was regressed against the independent variables. As shown in Table 4, the regression model was found to be fit ($F = 70.056$; $Sig. = .000$). The R^2 indicates the coefficient of determination of the predictor variables on the dependent variable. As indicated from the table, R^2 showed a value on .605, which means that 60.5% of the variance in firm performance could be explained significantly and collectively by the predictor variables. Collectively, the independent variables were found to be able to explain 59.7% of the variance in firm performance, which means that the model fit is valid across different sample sizes and can be validly generalized to the study population.

Based on the regression in table 7, the result shows that all the variables were positively significant. As indicated earlier, multiple regression analysis can also determine which one among the predictor variables that has the most influence on firm performance. As shown in Table 7, (SI) showed the biggest beta value of 0.333, which it was significant at 0.001 levels.

Table 7: Regression Analysis

Coefficients ^a					
Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	.911	.181		5.030	.000
EO	.152	.051	.156	2.975	.003
SI	.308	.061	.333	5.040	.000
YTM	.108	.037	.149	2.948	.003

a. Dependent Variable: P

SI plays the most important role in predicting firm performance. EO beta value is 0.156 also considered to be high as compare to TM which is 0.149 with significant value of, .003. Table 8 indicated the results of the overall model.

Table 8: Regressions of EO, SI and TM on performance

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	54.410	6	9.068	70.056	.000 ^b
	Residual	35.468	274	.129		
	Total	89.878	280			

The main objective of this study was to determine the relationship of EO, SI and TM and effect on the organization performance among GLCs companies in Malaysia. Based on the result, all three hypotheses are confirmed, which are EO, SI and TM whereby it indicates that those three variables have a significant positive relationship with GLC’s performance. The understanding of this result is vital as the result showed an interesting fact, despite of a long and numerous arguments between scholars, which result in mutual agreement on the suggestion of a positive relationship between the entire tested variable with GLC’s performance. Entrepreneurial orientation is a key way to develop distinctive competencies such as product innovation (Hitt & Ireland, 1986). This findings showed that EO is a key driver of enhancing the companies’ performance.

Thus, it also proves, that EO can't be simply ignored by the top management once they need to enhance the performance. Additionally, EO is a vital variable in improving the GLC's performance, based on the theoretical understanding. This result was in line with previous studies such as Wiklund and Shepherd (2004), Yang (2008), Runyan, Droge, and Swinney (2008) and Wang (2008).

The result of this study also confirm that there is a significant positive relationship between SI and GLC's performance in line with the result from the previous scholars. Improvisation enables managers to continually learn while working and act spontaneously and creatively to consistently move products and services out of the door (Brown & Eisenhardt, 1997). By practicing improvisation, organizations could gain a better understanding on how individual and groups in organizations cope with and coordinate the conflicting demands of existing time perspectives (Crossan, Pina e Cunha, Vera, & Cunha, 2005); learn and adapt under time pressures (Vera & Crossan, 2005); and remain flexible under turbulent environments (Cunha, Cunha, & Kamoche, 1999).

5. CONCLUSION

The study explored on the relationship among EO, SI and TM and the performance of the GLCs. The outcomes of the study identified variables that are important in explaining the achievement of performance in the GLCs. The main objective of this study is to understand the best management practices of GLCs in Malaysia in terms entrepreneurial orientation, strategic improvisation and talent management and their relationships to firm performance. The study improves upon the existing theoretical framework from the literature of best practices on performance and the new knowledge generated from this study could assist theory building efforts particularly in the strategic and best practice management field. Furthermore, the findings of the study supported the RBV theories. The RBV on inimitable recourses and dynamic capabilities suggest that organizational should have their own competence according to knowledge resources. These competencies must be rare and unique. Moreover, researchers also found many of resources and capabilities on which competitive advantage is based reside in the operations function (Coates & McDermott, 2002; Lucas & Kirillova, 2011). On the managerial implication of the study, the study finds several statistically significant relationships with practical applications. Therefore GLCs should give the right priority to the implementation of the best practices to ensure favorable results.

REFERENCES

- Alegre, J., Lapiedra, R., Chiva, R. (2006). A literature-based innovation output analysis: Implications for innovation capacity, *International Journal of Innovation Management*, 9(4), pp. 385-399.
- Armstrong, J., Overton, T. (1977). Estimating nonresponse bias in mail surveys. *Journal of Marketing Research*, 14, pp. 396-402.

- Ang, J. S., & Ding, D. K. (2006). Government ownership and the performance of government-linked companies: the case of Singapore, *Journal of Multinational Financial Management*, 16, pp. 64-88.
- Axelrod, B., Handfield-Jones, H. and Michaels, E. (2002) "A new game plan for C players", *Harvard Business Review*, January, pp. 81-88.
- Barney, J. (1991). Firm resources and sustained competitive advantage, *Journal of Management*, Vol. 17(1), pp. 99–120.
- Baker T, Miner A, Eesley D, 2003. Improvising firms: bri-colage, account giving, and improvisational competency in the founding process. *Research Policy* 32: pp. 255–276.
- Brown, S. L., & Eisenhardt, K. M. (1997). The art of continuous change: linking complexity theory and time-paced evolution in relentlessly shifting organizations. *Administrative Science Quarterly*.
- Coates, T., McDermott, C. (2002). An exploratory analysis of new competencies: a resource based view perspective. *Journal of Operations Management*, 20(5), pp. 435-450.
- Covin, J. G., Slevin, D. P. (1989). Strategic management of small firms in hostile and benign environments. *Strategic Management Journal*, 10, pp. 75-87.
- Crossan, M., Cunha, M. P., Vera, D., and Cunha, J. (2005). Time and organizational improvisation. *Academy of Management Review*, 30(1), pp. 129-145.
- Crossan, M. M., Pina e Cunha, M., Vera, D., Cunha, J. (2005). Time and organizational improvisation. *Academy of Management Review*.
- Cunha, M. P., Cunha, J. V., Kamoche, K. (1999). Organizational improvisation: what, when, how, and why. *International Journal of Management Review*, 1(3), pp. 299-341.
- Dess, G., Robinson, R. (1984). Measuring organizational performance in the absence of objective measures: The case of the private-held firm and conglomerate business unit, *Strategic Management Journal*, Vol. 5(3), pp. 265-273.
- Fahy, J. (2000). The resource-based view of the firm: some stumbling-blocks on the road to understanding sustainable competitive advantage, *Journal of European Industrial Training*, Vol. 24(2/3/4), pp. 94-104.

- Gupta, A., Govindarajan, V. (1991). Knowledge flows and the structure of control within multinational corporations, *Academy of Management Review*, Vol. 16(4), pp. 768-792.
- Hitt, M. A., & Ireland, R. D. (1986). Relationships among corporate level distinctive competencies, diversification strategy, corporate strategy and performance. *Journal of Management Studies*.
- Hmieleski, K. M., & Corbett, A. C. (2008). The contrasting interaction effects of improvisational behaviour with entrepreneurial self-efficacy on new venture performance and entrepreneur work satisfaction. *Journal of Business Venturing*, 23(4), pp. 482-496.
- Hubbard, G. (2009). Managing organizational performance: Beyond the triple bottom line, *Business Strategy and the Environment*, Vol. 19, pp. 177-191.
- Jambekar, A., & Pelc, K. (2007). Improvisation model for team performance enhancement in a manufacturing environment. *Team Performance Management*, 13(7/8), pp. 259-274.
- Janney, J. J., & Dess, G. G. (2006). The risk concept for entrepreneurs reconsidered: new challenges to the conventional wisdom. *Journal of Business Venturing*, 21.
- Kurupparachchi, D., & Perera, H. S. C. (2010). Impact of TQM and technology management on operations performance. *Journal of Operations Management*, Vol. 23(47).
- Kamoche, K., Cunha, M.P. and Cunha, J.V. (2003). Towards a theory of organizational improvisation: Looking beyond jazz metaphor. *Journal of Management Studies*, 40(8), pp. 2023-2051.
- Kapelko, M. (2006). Evaluating efficiency in the framework of resource-based view of the firm: evidence from polish and spanish textile and clothing Industry,
- Laugen, B. T., Acur, N., Boer, H., & Frick, J. (2005). Best manufacturing practices: What do the best performing companies do? *International Journal of Operation & Production Management*, 25, pp. 131-150.
- Lin, C., Tsai, H., Wu, Y., Kiang, M. (2012). A fuzzy quantitative VRIO-based framework for evaluating organizational activities. *Management Decision*, Vol. 50(8), pp. 1396-1411.

- Lucas, M., Kirillova, O. (2011). Reconciling the resource-based and competitive positioning perspectives on manufacturing flexibility. *Journal of Manufacturing Technology Management*, Vol. 22(2), pp. 189-203.
- March, J.G. (1991). Exploration and exploitation in organizational learning. *Organizational Science*, 2, pp. 71–87.
- McGrath, R.G. (2001). Exploratory learning, innovative capacity, and managerial oversight. *Academy of Management Journal*, 44(1), pp. 118–131.
- Moorman, C. and Miner, A.S. (1998b). The convergence between planning and execution: Improvisation in new product development. *Journal of Marketing*, 62(3), pp. 1-20
- Mullins J, Komisar R. 2009. *Getting to Plan B: Breaking through to a Better Business Model*. Harvard Business School Press: Boston, MA.
- Musa, M. B. (2007). *Towards A Competitive Malaysia: Development Changes in the 21st Century*. Strategic Information and Research Development Centre.
- Oltra, M. J., & Flor, M. L. (2010). The moderating effect of business strategy on the relationship between operations strategy and firm’s results. *International Journal of Operations & Production Management*, 30(6), pp. 612-638.
- O'Regan, N., Ghobadian, A. (2004). Short- and long-term performance in manufacturing SMEs: different targets, different drivers. *International Journal of Productivity and Performance Management*, 53(5), pp. 405-424.
- Pruis, E. (1989). The five key principles for talent development. *Industrial and Commercial Training*, Vol. 43(4), pp. 206-216.
- Runyan, R., Droge, C., Swinney, J., (2008). Entrepreneurial orientation versus small business orientation: what are their relationships to firm performance? *Journal of Small Business Management*, 46(4), pp. 567–588.
- Salaman, G., Storey, J., Billsberry, J. (2005). *Strategic Human Resource Management: Theory and Practice*. London: SAGE Publication Ltd.
- Singh, K., & Ang, S. H. (1999). Government in business: an empirical analysis of the strategies and success of government linked corporations in Singapore. *Academy of Management*, pp. 1-6.
- Skinner, W. (1969). Manufacturing: the missing link in corporate strategy. *Harvard Business Review*, 47, pp. 136–145.

- Souchon, A.L., & Hughes, P. (2007). Improving export decisions: a contingency theory perspective. *International and Cross-cultural Marketing, Track 8*.
- Tansley, C. (2011). What do we mean by the term "talent" in talent management? *Industrial and Commercial Training, Vol. 43(5)*, pp. 266-274.
- Ting, I., Lean, H. (2011). Capital structure of government-linked companies in Malaysia. *Asian Academy of Management Journal of Accounting and Finance, Vol. 7(2)*, pp. 137-156.
- Vietor. (2007). *How countries compete: strategy, structure, and government in the global economy*. Harvard: Harvard Business School Press.
- Vera, D., & Crossan, M. (2005). Improvisation and innovative performance in teams. *Organization Science, 16(3)*, pp. 203-224
- Wang, C. L. (2008). Entrepreneurial orientation, learning orientation, and firm performance. *Entrepreneurship Theory and Practice, 32(4)*, pp. 635-656.
- Wiklund, J. & Shepherd, D. (2005). Entrepreneurial orientation and small business performance: a configurational approach. *Journal of Business Venturing, 20(1)*, pp. 71-89.
- Yang, C-W. (2008). The relationships among leadership styles, entrepreneurial orientation, and business performance. *Managing Global Transitions 6(3)*, pp. 257-275.
- Zahra, S. A., & Covin, J. G. (1995). Contextual influences on the corporate entrepreneurship-performance relationship: a longitudinal analysis. *Journal of Business Venturing, 10(1)*, pp. 43-58.
- Zikmund, W. G. (2003). *Business research methods (7th ed)*. Ohio: Thompson South-Western.



THE EFFECT OF MACRO ECONOMIC VARIABLES ON FOREIGN PORTFOLIO INVESTMENTS: AN IMPLICATION FOR TURKEY

DOI: 10.17261/Pressacademia.201519962

Aynur PALA¹, Bilgin ORHAN ORGUN²

¹ Okan University. E-mail: aynur.pala@okan.edu.tr

² Okan University. E-mail: bilgin.orgun@okan.edu.tr

Keywords:

foreign portfolio investment,
factor analysis,
OLS with structural break,
unit-root tests

JEL Classification:

F32, C38, C32, C22

ABSTRACT

The aim of this study is to determine the effect of macroeconomic variables on foreign portfolio investments (FPI) in Turkey for the period of 1998-2012. We test stationarity of macroeconomic variables by using ADF and Zivot-Andrews unit-root tests with one structural break. We have used factor analysis for both reduction and classification of twenty three variables. To determine cointegration among variables, Johansen cointegration test was applied and we saw that variables are cointegrated. Finally, we used OLS with structural break model. We found that, deposit interest rate, gross national income and current account balance have had a positive effect on foreign portfolio investment. The effect of deposit interest rate on FPI has turned to negative, after 2003, because of structural break resulted from inflation targeting starting with The New Economic Stability Program in Turkey. We saw that with the start of the new economic stability program by Turkish government, dependent variable, average foreign portfolio investment growth has turned to positive post-2003.

1. INTRODUCTION

There is a common belief that foreign investments have been beneficial for economic growth of the countries. It is believed that increased international investments and capital flows to any country could increase overall efficiency of the country and help regulate the balance of payments and foreign trade deficits. Because of this reason a lot of countries, especially the developing countries, have liberalized, improved and deregulated their infrastructure (logistics, internet, roads, communication etc.), institutional organization, investment, banking and stock exchange environment to encourage international investments for getting more benefits from the global investments and resources.

According to the UNCTAD WIR report 2013, most investment policy measures remain geared towards investment promotion and liberalization¹.

The world has witnessed a rise of capital flows across the world in terms of financial integration before 2008 financial crisis. But foreign portfolio investments in debt and equity securities and cross-border flows capital have dramatically declined after 2008 crises. The share of regulatory or restrictive investment policies increased up to %27 in 2013. Some host countries have sought to prevent foreign investors' activities in their countries². Uctum et al. (2011) found significant and positive relationship between crisis and foreign portfolio investments.

UNCTAD reported in 2014 WIR report overview that investment incentives mostly focus on economic performance objectives, less on sustainable development. In this context most of the scholars studied on economic performance objectives to examine determinants of foreign portfolio investments. James et al. (2014) indicated that lower capital flows have coincided with weak macroeconomic and financial conditions in many economies. This has affected both the demand and supply of capital, with households and businesses (including banks) in many countries which less willing or able to take on risk. Garg et al. (2014) explained the positive relationship between domestic output growth, exchange rate volatility and portfolio investments. Kinda (2013) studied on 58 developing countries, between 1970-2003 and showed a positive and significant relationship between inflation, financial structure and development and foreign portfolio investments.

Kaminsky and Schmukler (2003), Prasad et al. (2003), Campion and Neumann (2004) and Caprio et al. (2001) suggested that countries can increase incentives to attract more international capital flows by de-regulating activities in their domestic financial markets, and by liberalizing their capital account transactions and equity markets. They further explain that these policies can cause an increase in international capital inflows by reducing transaction costs and quantitative limits of ownership and investments, and by increasing returns on assets.

Another body of literature, including Baldwin (1997), Wakeman-Linn and Wagh (2008), and Garcia-Herrero and Wooldridge (2007) suggested that countries which are active members of regional blocs or signatories to regional free trade and investment agreements tend to attract more foreign investment flows. They further argue that this regional initiative can attract more foreign investments by producing benefits in terms of exploiting wide-ranging scale economies, expanded trade links and enhanced financial development within the regions concerned. Some academicians follow the pattern of liberalization of investments and trade. In this context many academic research and studies tried to explain the determinants of foreign portfolio investments. Researchers mostly focused on barriers for foreign portfolio investments such as transaction costs, different taxation, exchange rate, interest rates, capital market regulations, liberalization efforts and other restrictions for international investments, such as omitted assets, informational differences, and barriers due to investors' attitudes.

¹ WIR, 2013, Overview, UNCTAD, United Nations. New York and Geneva, 2014, p. ix.

² WIR, 2013, p. ix.

The aim of our study is to determine the effect of macroeconomic variables on foreign portfolio investment (FPI) in Turkey for the time period of 1998-2012. We firstly collected twenty-three macroeconomic and financial variables. Then we have used factor analysis for both reduction and classification of variables to get more reliable results. At the end of the factor analysis we selected deposit interest rate, current account balance and GNI growth rate to use in our model. We test stationarity of macroeconomic variables by using ADF and Zivot-Andrews unit-root tests with one structural break and we saw that all variables are stationary. Johansen cointegration test results showed that variables are cointegrated. We used OLS with structural break model which has been proposed by Onuorah and Akujuobi (2013). We found that deposit interest rate, gross national income and current account balance have had a positive effect on FPI. The effect of deposit interest rate on FPI has turned to negative from positive, after 2003, because of structural break resulted from inflation targeting starting with the new economic stability program in Turkey. We saw that with the impact of this new economic stability program, our dependent variable, average foreign portfolio investment growth has turned to positive after 2003.

2. LITERATURE REVIEW

In this part of the study, the recent literature on the determinants of foreign portfolio investments is analyzed in detail. We summarized the literature related to our study and our findings in the table 1. We gave also the name of the studies which we analyzed, methods used in the studies, country, time period of the analyzes, and coefficient signs in Table 1. In the literature, the relationship between interest rate and FPI was examined in five studies, Kreicher (1980), Eratas and Oztekin (2010), Korap (2010), Verma et al. (2011), and Onuorah and Akujuobi (2013). In all these studies the effect of interest rate on FPI was positive. Five studies including Verma et al. (2011), Kinda (2012), Gumus et al. (2013) Onuorah and Akujuobi (2013), Garg et al. (2014) economic growth effect on FPI was examined, except Onuorah and Akujuobi (2013), positive impact of economic growth on FPI was determined. Gumus et al. (2013), Yıldız (2012) and Korap (2010) investigated budget balance and current account balance effect on FPI. Gumus et al. (2013), and Korap (2010) concluded that these variables have positive effect on FPI however Yıldız (2012) found negative effect of current account balance on FPI.

Table 1: Literature Summary

Study	Method	Country	Period	Variables	Coef. Sign
Kreicher (1980)	OLS	USA, W. Germany, UK, Italy	1974-1976	Interest Rates	+
Brennan et al. (1997)	Dynamic generalization of the multi asset noisy rational expectations model	USA	1982q2-1994q4	Exchange rate	+
Verma et al. (2011)	VAR	India	2000-2009	Domestic output of OECD	+
				Growth rate of OECD	+
				Interest rate differentials	insignificant
				Nominal exchange	-
Kinda (2012)	SUR	58 developing countries	1970-2003	Inflation	+
				Growth Rate	+
				Financial Infrastructure and Financial Development.	+
Kodongo et al. (2012)	VAR	Egypt, Morocco, Nigeria, and South Africa	1997:1 to 2009:12	Foreign Exchange Rates	Morocco, - Nigeria, +
Gumus et al. (2013)	Granger Causality	Turkey	2006-2012	- Industrial Production Index - Budget Balance - Current Account Balance - ISE Price Index - Exchange Rate - Consumer Price Index - Interest Rates - Industrial Production Index	
Onuorah and Akujuobi (2013)	OLS with Structural Breaks	Nigeria	1980-2010	Interest rate	+
				Exchange rate	+
				Inflation	+
				Gross Domestic	-
				Money Supply	-
Garg et al. (2014)	GARCH	India	1995-2011	Emerging market	-
				Risk diversification	-
				Country risk	-
				Currency risk	-
				Domestic output	+
				Exchange rate	+
				Exchange rate	+
Greater risk on return	+				

				Regionalism	
Levent Korap (2010)	SVAR	Turkey	1992-2009	Real Interest rate Current Account Deficit	+ + -
Erataş and Oztekin	ARDL	Turkey	1995-2009	- real interest rate - exchange rate	+ -

French (2011) determined particularly that unexpected shocks to returns, forecast greater net foreign equity flows into South Africa beyond what could be predicted from net flows in lagged periods. This result is consistent with broad literature insisting that foreign equity investors are ‘return chasers’. French indicated that foreign equity investment does not appear to pressure prices upward in South Africa. Anoruo (2012) used multivariate cointegration test between investments and Canadian stock market returns, and the S&P 500 returns. Anoruo found that there is one significant cointegrating vector between investment, the Canadian stock market returns, and the S&P 500 returns. The finding of cointegration between the time series suggests that they share long run equilibrium relationship. Deviation from the equilibrium relationship is corrected in the subsequent period. Furthermore, the existence of cointegration among the series is important because it would affect the model setup. Gabor (2011) searched the relationship between emerging market stock returns and foreign investments flow for three emerging economies, Hungary, Turkey and Poland for different time periods. Gabor found that emerging market stock returns has positive effects on foreign portfolio investments for all three countries.

Ülkü and Weber (2014) stated that “evidently, the considered exogenous variables successfully cover the common factor influence such that no shock correlation remains”. They mentioned that the spillover from returns to flows is highly significant. This suggests that the contemporaneous association between foreign flows and local returns is, to a larger extent, driven by returns affecting flows rather than vice versa.

Yıldız (2012) analyzed factors affecting foreign portfolio investments by using multiple regression models for the time period 1999-2009. The author analyzed the model for the time period of 1999-2002, 2003-2006, and 2007-2009 separately, and found that for all these three time period, stock returns for BIST (İstanbul Stock) and Dow Jones, has positive effects. The paper concluded that investors are not against higher risk for higher stock returns.

Kreicher (1980) investigate the empirical relationship between long-term portfolio capital flows and the real rate of interest for three European countries and the United States. Only long term portfolio flows into and out of the private sectors of the United Kingdom, West Germany, Italy, and the United States was examined. Stock-adjustment approach to capital flow modeling developed by Branson (1968) was used in this study. Real (long-term) interest rates, activity variables (industrial production indices), and dummy variables (seasonal and exchange market crises) were explanatory variables. Kreicher (1980) found positive effect of real interest rate on portfolio capital flows.

Verma et al. (2011) tried to find empirical evidence of sensitivity of capital inflows to interest rate differential in the India. The authors used causality and cointegration analyses, suggesting that FDI and FII equity flows, during the 10-year period from 2000-01

to 2009-10, are not sensitive to interest rate differentials. Verma et al. (2011) concluded that exchange rate, domestic output and growth rate of OECD economies are the other major factors having an impact on the net capital inflows to India. Both domestic output and OECD growth rate positively affect- the net capital inflows while nominal exchange rate impacts it negatively.

Korap (2010) analyzed factors affecting portfolio capital flows experienced by the Turkish economy in two categories, 'pull' and 'push' based factors. Korap used the domestic real interest rate, current account balance, domestic stock return and expected domestic inflation variables as 'pull' factors. The author applied structural identification methodology of vector autoregressive models (SVARs) between the time period of 1992-2009. The domestic real interest rate is found in a negative dynamic relationship with portfolio flows. This result is attributed to that the dynamic course of the portfolio flows should not be related to the excess return possibilities of the real interest structure of the Turkish economy. Rather, the dynamic behavior of the capital flows should be related to the risk considerations of the economic agents resulted from the negative fundamentals of the economy associated with high risk premiums.

Eratas and Oztekin (2010) investigate the relationship between short term capital flows (STCF) and real interest rate and exchange rate in Turkey for time period of 1995-2009 quarterly by using ARDL (autoregressive Distributed Lag) method. In long term they found positive relationship between STCF and real interest rate, and negative between STFC and exchange rate. In short term there is an insignificant relation between STCF and real interest rate, and negative and significant relationship between STCF and exchange rate.

Onuorah and Akujobi (2013) examined the impact of macroeconomic variables on foreign portfolio investments in Nigeria between the time period of 1980-2010. They used Ordinary Least Square (OLS) model and found that money supply, gross domestic product growth, interest, inflation and exchange rates have directly impact on FPI in the country. Interest, inflation and exchange rates have positive effect and the other variables have negative effect on FPI.

3. DATA AND METHODOLOGY

3.1. Data

We used deposit interest rate (annual, %), gross national income (annual, % growth), and current account balance (annual, \$) variables for Turkey as explanatory variables. We collected yearly data from World Bank, Central Bank of the Republic of Turkey for time period of 1998-2012. STATA and SPSS were used for econometric and statistical analysis. The explanatory variables examined in this study are given in Table 2, containing definition of variables, code and data sources. We generate dummy variables to investigate the effects of structural breaks for 2003, 2005 and 2008 (pre-0, post- 1).

Table 2: Variables

Variables	Code	Sources
Gross National Income (annual, growth %)	GNIG	World Bank
Deposit Interest Rate (annual, %)	DIR	World Bank
Foreign Portfolio Investment (annual, cumulative, billion US\$, growth)	FPIG	CBRT
Current Account Balance (annual, cumulative, \$, growth)	CADG	CBRT
Post-2003 Dummy Variable (2003=>T= 1, others=0)	DUM2003	Authors
Post-2005 Dummy Variable (2005=>T= 1, others=0)	DUM2005	Authors
Post-2008 Dummy Variable (2008=>T= 1, others=0)	DUM2008	Authors

3.2. Methodology

Econometric Model

In related literature, OLS model has been used by Kreicher (1980), Yildiz (2012), and Onuorah and Akujuobi (2013). Because our variables are stationary with structural breaks, we prefer using OLS with structural break model proposed by Onuorah and Akujuobi (2013). We estimated OLS with structural break model as below:

$$FPIG_t = \alpha_0 + \beta_0 DIR_t + \beta_1 GNIG_{t-1} + \beta_2 CADG_t + \beta_3 GNIG_{t-1} * S2008DUM$$

$$+ \beta_4 DIR_t * S2003DUM + \beta_5 S2003DUM + \beta_6 S2005DUM + \varepsilon_t \quad (1)$$

In our model, t refers to time series from 1 to 25, $FPIG_t$ refers to portfolio investments changing (% annual growth) variable at period t, DIR_t refers to deposit interest rate (% annual) variable at period t, $CADG_t$ refers to current account balance changing (% annual growth) variable at period t, $GNIG_t$ refers to GDP growth (% annual growth) variable at period t, S2008DUM dummy refers to post-2008 mortgage crisis, S2005DUM dummy refers to post-2005, and S2003DUM dummy refers to post-2003. $\alpha_0, \beta_0, \beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6$ refer to sensitivity coefficient of variables, and ε_t the error terms.

3.3. Results

Factor Analysis

We set our model with twenty-three macroeconomic and financial variables in the beginning of the study. To classify and reduce these variables we first investigated multicollinearity. Multicollinearity occurs when there are high correlations among explanatory variables, causing unreliable estimates of regression coefficients.

Chatterjee et al (2000) suggest that multicollinearity is present if the mean of VIF (Variance Inflation Factor) is larger than 1. We test and found that multicollinearity exist in our model because the mean of VIF value was calculated 14.28 (> 1). The VIF value indicates that these variables are redundant. So we decided to use factor analysis to avoid multicollinearity.

Factor analysis method is commonly used for reduction of variables, scale development, avoiding multicollinearity and the assessment of the dimensionality of a set of variables. We applied the rules for factor analysis as follows. First we applied "eigenvalues greater than one rule" to determine the validity of factors. And then we used "convergent validity" proposed by Bogazzi and Yi (1988) to validate the importance of variables in factors. Convergent validity means that the variables within a single factor are highly correlated and it is verified that the factors show sufficient validity. According to this rule if the factor loading is greater than 0.7 we can mentioned about convergent validity. We test and factor loading exceed 0.7 in our model, this is an acceptable and strong evidence of convergent validity. We used Kaiser-Guttman rule to determine the optimal number of factors to extract for our model. The "eigenvalues greater than one" rule has been used due to its simple nature and availability in various computer packages. As a result of the tests in context of "eigenvalues greater than one" rule, we concluded that there are three factors in our model which we can use.

Factor analysis provided us three homogenous factors reduced from twenty-three variables and results were given in table 3. Fifteen variables are selected in factor 1, and taking into account the factor loadings we observe that twelve of these fifteen variables have exceeded 0,7 factor loading. Notice that the first factor accounts for 55% of the total variance. Six variables are selected in factor 2 and accounts for the 21% of the total variance, all of these six variables have exceeded 0,7 factor loading. Two variables are selected in factor 3, accounting for the 8.6% of the total variance and only current account balance variable exceeded 0.7 factor loading. Three factors totally account for 84.5% of total variance. Then we made another selection from these three factors. We selected one variable which has the highest factor loading from every each factor as proxy. Deposit interest rate (annual, %) for factor 1, GNI (annual, % growth) for factor 2, and current account balance (annual, % growth) for factor 3.

Table 3: Factor Analysis Result

Variable with Significant Factor Loading	Factor Loading	Factors	Eigenvalue	Percentage	Cum. Per.
Net National Saving (% of GNI)	0.9235*	Factor 1	12.5117	0.5440	0.5440
GDP per capita (current, \$)	-0.8766*				
Gross savings (% of GDP)	0.8409*				
Gross savings (% of GNI)	0.8510*				
Domestic Credit to Private sector (% of GDP)	-0.7740*				
Domestic Credit to Private sector by banks (of % GDP)	-0.7215*				
Deposit Interest Rate (% annual)	0.9712*				
M2 (% of GDP)	-0.6438				
Current Account Balance (annual, \$)	0.8606*				
Current Account Balance (% of GDP)	0.7992*				
Public Sector Borrowing Requirement (% of GDP)	0.8766*				
Government Bond Interest Rate (annual, %)	0.6869				
Consumer Price Index (annual, % growth)	0.9386*				
US Dolar Exchange Rate (annual, % growth)	0.7611*				
Foreign Direct Investment, net flow (\$)	-0.6944				
GNI (annual, % growth)	0.8106*	Factor 2	4.9367	0.2146	0.7586
Adjusted Net National Income (annual, % growth)	0.7792*				
GDP (annual, % growth)	0.7972*				
GNI per capita (annual, % growth)	0.8025*				
GDP per capita (annual, % growth)	0.8034*				

M2 (annual, % growth)	0.8002*				
Current Account Balance (annual, % growth)	-0.7641*	Factor 3	1.9908	0.0866	0.8452
BIST-100 Stock Exchange (annual,% growth)	0.5609				

Note: *, represent statistical significant.

Stationarity

Cointegration analysis requires that the variables are first-order integrated. We investigated for the series’ order of integration by using ADF unit-root tests. Table 4. shows the results of ADF applied to the variables in level. The main purpose of employing a unit root test is to pose whether or not the variables are stationary series. We employ one of the most applied approaches, the ADF unit root test. Dickey and Fuller (1979) present the ADF unit root test as:

$$\Delta y_t = \beta' D_t + \pi y_{t-1} + \sum_{j=1}^p \phi_j \Delta y_{t-j} + \varepsilon_t$$

where ε_t is a normally distributed white noise error term, D_t is a deterministic time trend, y_{t-1} is the laged value of the variable y_t , Δy_{t-j} are the laged values of the first differences of the variable y_t , and β, π, ϕ are the estimated coefficients.

Tablo 4: ADF Unit-Root Test

Değişkenler	t istatistiği			
	None	Noconstant	Trend	Drift
Foreign Portfolio Investment (annual, % growth)	-6.825*	-4.553*	-6.691*	-6.825*
Deposit Interest Rate (annual, %)	-1.841	-2.139*	-2.442	-1.841*
GNI (annual, % growth)	-3.652*	-2.616*	-3.659*	-3.652*
Current Account Balance (annual, %)	-4.932*	-4.939*	-5.786*	-4.932*
5% critic value	-3	-1.95	-3.6	-1.78

Note: *, represent statistical significant with 5% level.

As a result, the null hypothesis of unit-root is rejected for Deposit Interest Rate (annual, %), GNI (annual, % growth), and Current Account Balance (annual, % growth) variables, and all variables are stationary.

There are a lot of politic and economic changes, local and global crises in Turkey between 1998-2012. The composition of Turkish parliament has completely changed after 2002 general elections, and coalition era is over. This provided political and economical stability in Turkey. The Law of Central Bank of Turkey (CBT Law) which was amended in April 2001, having strengthened the independence of CBT by allowing the bank to be fully authorized to choose and apply monetary policy instrument. CBT implemented “Implicit Inflation Targeting” regime between 2002 and 2005. In 2003, New Stability Programme was

released, deposit insurance fund reserve rate was increased up to 100% and weaken dollar caused decreasing in interest rate. At the end of 2005, The CBT changed operational framework for the inflation targeting regime and have started to implement Full-Fledged Inflation Targeting. Because of 2008 mortgage crisis, economic growth of Turkey has fallen sharply to %0,9 in 2008 and % -4.8 in 2009 compared to previous years.

Whether these changes have impact on structure of our series, we searched structural breaks if any, by using Zivot-Andrews Unit-Root Test. Zivot and Andrews (1992) based on basically the Perron unit root tests. They used regressions below to test for a unit root against the alternative of trend stationarity process with a structural break both in slope and intercept:

$$Y_t = \mu + \theta DU_t(\tau_b) + \beta T + \alpha Y_{t-1} + \sum \varphi_i \Delta Y_{t-i} + u_t \quad (3)$$

$$Y_t = \mu + \gamma DT_t(\tau_b) + \beta T + \alpha Y_{t-1} + \sum \varphi_i \Delta Y_{t-i} + u_t \quad (4)$$

$$Y_t = \mu + \theta DU_t(\tau_b) + \beta T + \gamma DT_t(\tau_b) + \alpha Y_{t-1} + \sum \varphi_i \Delta Y_{t-i} + u_t \quad (5)$$

Where DU_t and DT_t are dummy variables for a mean shift and a trend shift respectively; $DU_t(\tau_b) = 1$ if $t > \tau_b$ and 0 otherwise, and $DT_t(\tau_b) = t - \tau_b$ if $t > \tau_b$ and 0 otherwise. In other words, DU_t is a sustained dummy variable that captures a shift in the intercept, and DT_t represents a shift in the trend occurring at time τ_b . The breakpoint τ_b can be found by using the Quandt-Andrews breakpoint test. The optimal lag length p is also determined by using the general to specific approach so as to minimize the AIC or SIC. The Zivot and Andrews (1992) unit root test suggests that we reject the null hypothesis of a unit root if computed $\hat{\alpha}$ is less than the left-tail critical t value. Eddrief-Cherfi and Kourbalı (2012)

Results of test are given at Table 5. The null hypothesis of unit-root is rejected for deposit interest rate (annual, %), GNI (annual, % growth), and current account balance (annual, % growth) variables. The series are stationary with one structural break. Deposit interest rate is stationary with structural break at both constant and trend in 2002. GNI (annual, % growth) is stationary with structural break at constant in 2008, and also at trend in 2005. Current account balance (annual, % growth) variable is stationary with structural break both constant and trend in 2005.

Table 5: Zivot-Andrews Unit-Root Test (with one structural break)

Değişkenler	t stat					
	Constant	Structural Break Point	Trend	Structural Break Point	Constant and Trend	Structural Break Point
Portfolio Investment (annual, % growth)	-9.898*	2003	-7.638*	2004	-7.112	2005
Deposit Interest Rate (annual, %)	-5.152*	2003	-4.454*	2005	-5.529*	2002

Gross National Income (annual, % growth)	-5.046*	2008	-4.352*	2005	-4.862	2008
Current Account Balance (annual, % growth)	-13.466*	2006	-6.442*	2010	-16.144*	2006
5% critic value	-4.8		-4.42		-5.08	

Note: *, represent statistical significant with 5% level.

Co-integration Test

Co-integration implies that one or more linear combinations of the time-series variables are stationary even though they are individually non-stationary (Dickey et al., 1991). Before applying a co-integration test, we first should determine the optimal lag length by using selection-order criteria such as LR and AIC. For the case of Turkey the appropriate lag length is two. After determining the optimal lag length, the Johansen ML cointegration test presented by Johansen (1988, 1991) is applied to finalize whether or not variables are co-integrated.

What we need to know is the value of the rank, if the rank (r) is zero, there will be no co-integration. If the rank (r) is one there will be one co-integrating relation, if it is two there will be two co-integration and so on. When there is co-integration between two time series, these series will have a long-run relation and roughly follow the same patterns.

The Johansen ML co-integration test is based on the maximum likelihood estimation and two statistics: the maximum eigenvalue (Kmax) and the trace-statistics (λ_{trace}), where the λ_{trace} tests the null hypothesis that r is equal to zero (no co-integration) against a general alternative hypothesis of $r > 0$. The Kmax tests the null hypothesis that the number of co-integrating vectors is r versus the alternative of r+1 co-integrating vectors. Doğan (2014) Johansen trace test were applied in a stepwise procedure for indicating the long-run relationships between series. Results of the Johansen trace test for cointegration are reported in Table 6. Series have a long-run relationship at the 5% significance level for full sample, meaning that there are three ranks and therefore cointegration relations between series.

Table 6: Johansen Test for Cointegration

Lags(2)	Null /Alternative	Trace Statistics	5% critical value	Max-Eigen Statistics	5% critical value
Full Sample	r=0 / r≥1	410.53	47.21	322.36	27.07
	r≤1 / r≥2	88.17	29.68	52.30	20.97
	r≤2 / r≥3	35.86	15.41	32.49	14.07
	r≤3 / r≥4	3.36*	3.76	3.36	3.76

Heterogeneity and Autocorrelation Tests

We used heterogeneity tests proposed by Breusch Pagan/Cook-Weisberg LM and White’s (1980). The null hypothesis of Breusch-Pagan / Cook-Weisberg test indicates that the all error variances are equal against the alternative hypothesis that the error variances are a

multiplicative function of one or more variables. The results of tests shown in Table 7. The null hypothesis indicated that homoskedasticity cannot be rejected.

Table 7: Heterogeneity Tests

	Breusch Pagan/ Cook-Weisberg LM	White's Test
Chi-Square	0.5800 (0.4448)	13.0000 (0.3690)

Note: (), represent p value. Ho: homoskedasticity

Autocorrelation test developed by Wooldridge (2002) is used to investigate serial correlation. F statistics is 7.162 and p probability is 0.010. As a result of this, the null hypothesis "no serial correlation" can be rejected, meaning that error term has a serial correlation. We calculated "newey west error terms" to correct autocorrelation problem.

Table 8: OLS with Structural Break Model Estimation

<u>Dependent Variable: Portfolio Investment_(annual, % growth)</u>			
<u>Explanatory Variables</u>	Coefficient	t stat.	Robust std. error
Deposit Interest Rate (annual, %)	12.308* (0.002)	5.78	7.431
Gross National Income (annual, % growth), t-1	23.133* (0.001)	6.49	16.408
Current Account Balance (annual, % growth)	0.485* (0.000)	9.32	0.171
Gross National Income (annual, % growth), t-1 *2008 Dummy Variable	41.683* (0.000)	5.87	32.102
Deposit Interest Rate (annual, %)*2003 Dummy Variable	-19.163* (0.003)	-3.75	10.119
2003 Dummy Variable	1050.147* (0.001)	6.02	870.560
2005 Dummy Variable	-173.690* (0.032)	-2.57	137.036
Constant	-1039* (0.000)	-8.43	663.975

Note: *, represent statistical significant with 5% level.

The effect of deposit interest rate (annual, %) on portfolio investment variable (annual, % growth) is positive and statistically significant. Before 2003, %1 increasing in deposit

interest rate (annual, %) caused %13 growth in portfolio investment (annual, % growth) variable. However after 2003, %1 increasing in deposit interest rate (annual, %) has caused %7 decreased in portfolio investment (annual, % growth) variable. So, although increasing in deposit interest rate (annual, %) has positive effect on portfolio investment (%) variable before 2003, its effect has shifted from positive to negative on the same variable after 2003. In case, all variables are constant during time period, the average portfolio investments growth was negative before 2003 and but it has been positive after 2003.

Higher risk appetite has increased inflow of money to emerging countries which have relatively higher risk and return in investments. %1 increasing in one period lagged GNI (annual, % growth) provides %23 growth in portfolio investment (annual, % growth). Positive impact of the economic growth on portfolio investments has increased its strength after the 2008 crisis. %1 increase in the current account balance (annual, % growth) variable provides increase of 0.48 units in foreign portfolio investments (annual, % growth). Yıldız (2012) revealed that the current account balance negatively affected portfolio investments during the 2001-2005 periods. In this study we concluded unlike Yıldız (2012) that the growth in current account balance has increased foreign portfolio investments. Risk appetite for Turkey is positive that means that foreign investors invest their funds in Turkey to get more return in investment thanks to the higher risk.

Onuroah and Akujuobi (2013) found that real interest rate has positive effect on foreign portfolio investments however GDP has negative effect. These results are unlike our results. Garg et al. (2014) found that domestic output growth for India has positive effect on FPI and this result is compatible with our result for GNI growth. The result of Korap (2010) on interest rate and current account balance has negative effect on FPI and supports our findings.

5. CONCLUSION

The aim of this study is to determine the effect of macroeconomic and financial factors on foreign portfolio investment for Turkey for the period of 1998-2012. For this purpose, twenty-three variables were evaluated and classified using by factor analysis method. This selection gave us three most important factors and variables for our model including deposit interest rate (annual, %), GNI (annual, % growth), and current account balance (annual, % growth). We investigated stationarity using by ADF unit-root and Zivot-Andrews unit-root with one structural break tests. Finally, we used OLS with structural break dummy variable model. As a result, we found that deposit interest rate (annual, %), gross national income (annual, growth %), and current account balance (annual, % growth) have a positive effect on foreign portfolio investment (annual, % growth) in Turkey. CBT implemented "implicit inflation targeting" regime between 2002 and 2005. This new regime for inflation targeting has changed the impact of deposit interest rate on foreign portfolio investment from positive to negative after 2003. Average foreign portfolio investment up to 2003 was negative in Turkey. But from 2003 foreign portfolio investment flows into Turkey began to increase because of economic and political developments and fiscal regime changing. We concluded that deposit interest rate, GNI growth and current account balance are the main determinants of foreign portfolio

investments in Turkey. Turkish government can determine and affect the amount and the direction of foreign portfolio investments by using monetary and fiscal policies.

REFERENCES

- Ayşe YILDIZ. 2012. Yabancı Portföy Yatırımlarını Etkileyen Faktörlerin Belirlenmesi. Atatürk Üniversitesi İktisadi ve İdari Bilimler Dergisi, Cilt: 26, Sayı: 1.
- Anne-Sophie Van Royen. 2002. Financial Contagion and International Portfolio Flows. Financial Analysts Journal: Ja'n/Feb 2002; 58, 1; ABI/INFORM Global. pg.35.
- Baldwin, Richard E. (1997) "The Causes of Regionalism," The World Economy. Vol. 20, No. 7: 865-888.
- Berkel Barbara. 2007. Institutional Determinants of International Equity Portfolios - A Country-Level Analysis. The B.E. Journal of Macroeconomics: Vol. 7: Iss. 1 (Topics), Article 34. Available at: <http://www.bepress.com/bejm/vol7/iss1/art34>.
- Brafu-Insaidoo William Gabriel and Nicholas Biekpe. 2014. Determinants of foreign capital flows:
 - the experience of selected sub-saharan african countries. Journal of Applied Economics. Vol XVII, No. 1 (May 2014), 63-88.
- Byrne, J. P., and Fiess, N. 2011. International capital flows to emerging and developing countries: National and global determinants. Working papers 2011_01. Business School – Economics, University of Glasgow.
- Brennan Michael J. and H. Henry Cao. 1997. International Portfolio Investment Flows. The Journal of Finance . Vol. LII, No. 5. December 1997.
- Campion, M. K., Neumann, R. M., 2004. Compositional effects of capital controls: evidence from Latin America. The North American Journal of Economics and Finance 15, 161-178.
- Cooper, I., Kaplanis, E., 1994. Home bias in equity portfolios, inflation hedging, and international capital market equilibrium. Review of Financial Studies 7, 45–60.

- De Santis Roberto A. and Melanie Lürhmann. 2008. On the determinants of net international portfolio flows: A global perspective. *Journal of International Money and Finance* 28 (2009) 880–901.
- Dogan, E. (2014), Energy Consumption and Economic Growth: Evidence from Low-Income Countries in Sub-Saharan Africa. *International Journal of Energy Economics and Policy*, 4(2), 154-162.
- Eddrief-Cherfi, S., Kourbali, B. (2012), Energy Consumption and Economic Growth in Algeria: Cointegration and Causality Analysis. *International Journal of Energy Economics and Policy*, 2(4), 238-249.
- Elliott James, Kate McLoughlin and Ewan Rankin. 2014. Cross-border Capital Flows since the Global Financial Crisis. *Bulletin of Reserve bank of Australia*. June quarter 2014.
- Emmanuel C. Anoruo, Bansi L. Sawhney, and William R. DiPietro. 2012. Investment and Returns: Canadian Stock Market. *SCMS Journal of Indian Management*, July - September, 2012.
- Eniko Gabor (2011) The interaction between foreign flows and emerging market stock returns: The case of Hungary, Turkey and Poland. Master Degree Thesis. Central European University Department of Economics.
- Eratas, F., Oztekin, D. (2010), "Kısa Vadeli Sermaye Akımlarının Belirleyicileri: Türkiye Örneği", *Ekonomi Bilimleri Dergisi*, C. 2, S. 2
- Eva Liljebloom and Anders L'oflund. 2004. Determinants of international portfolio investment flows to a small market: Empirical evidence. *Journal of Multinational Financial Management*. *J. of Multi. Fin. Manag.* 15 (2005) 211–233.
- Felices, G., and Orskaug, B. 2008. Estimating the determinants of capital flows to emerging market economies: A maximum likelihood disequilibrium approach. Working paper no. 354. Bank of England.
- Frankel, J.A., 1991. Quantifying international capital mobility in the 1980s. In: Bernheim, D., Shoven, J.B. (Eds.), *National Savings and Economic Performance*. University of Chicago Press, Chicago.
- French, K.R., Poterba, J.M., 1991. Investor diversification and international equity markets. *American Economic Review* 81, 222–226.

- García-Herrero, A and P Wooldridge (2007): “Global and regional financial integration: progress in emerging markets”, BIS Quarterly Review, September, pp 57–70.
- Geert Duysters and Boris Lokshin. 2011. Determinants of Alliance Portfolio Complexity and Its Effect on Innovative Performance of Companies. *J. Prod. Innov. Manag.* 2011;28:570–585. 2011 Product Development & Management Association DOI: 10.1111/j.1540-5885.2011.00824.x.
- Glassman, D.A., Riddick, L.A., 2001. What causes home asset bias and how should it be measured? *Journal of Empirical Finance* 8, 35–54.
- Elliott James, Kate McLoughlin and Ewan Rankin, 2014, *Cross-border Capital Flows since the Global Financial Crisis, Reserve Bank of Australia, Bulletin-June Quarter 2014*, <http://www.rba.gov.au/index.html>
- Joseph J. French. 2011. The dynamic interaction between foreign equity flows and returns: evidence from the Johannesburg stock exchange. *The International Journal of Business and Finance Research*. Volume 5. Number 4.
- Jun Wu, Shaomin Li, David D. Selover. 2012. Foreign Direct Investment vs. Foreign Portfolio Investment, The Effect of the Governance Environment. *Management International Review*. *ManagInt Rev* (2012) 52:643–670 DOI 10.1007/s11575-011-0121-0
- Kaminsky, G., Schmukler, S., 2003, “Short-Run Pain, Long-Run Gain: The Effects of Financial Liberalization,” NBER Working Paper 9787, June.
- Kinda Tidiane. 2012. On the Drivers of FDI and Portfolio Investment: A Simultaneous Equations Approach *International Economic Journal*. Vol. 26, No. 1, March 2012, 1–22.
- Knill April M. 2010. Does Foreign Portfolio Investment Reach Small Listed Firms? *European Financial Management*, 2010. doi: 10.1111/j.1468-036X.2010.00572.x.
- Kodongo Odongo and Kalu Ojah. 2012. The dynamic relation between foreign exchange rates and international portfolio flows: Evidence from Africa's capital markets. *International Review of Economics and Finance* 24 (2012) 71–87.
- Kreicher Lawrence L. 1980. International portfolio capital flows and real rates of interests. *The Review of Economics and Statistics*. 1980.

- Levent Korap (2010). Identification of 'Pull' & 'Push' Factors for the Portfolio Flows: SVAR Evidence from the Turkish Economy, *Doğuş University Journal*, No. 11/2, pp. 223-32
- Michaelides Alexander. 2003. International portfolio choice, liquidity constraints and the home equity bias puzzle. *Journal of Economic Dynamics & Control* 28 (2003) 555 – 594.
- Numan Ülkü, and Enzo Weber. 2014. Identifying the Interaction between Foreign Investor Flows and Emerging Stock Market Returns. *Review of Finance* (2014) 18 (4):1541-1581.doi: 10.1093/rof/rft029. First publishedonline: July 26, 2013.
- Prasad, E., K. Rogoff, S-J. Wei and M. A. Kose. 2003. "Effects of Financial Globalization on Developing Countries: Some Empirical Evidence." Mimeo, 17 March, Washington D.C.: International Monetary Fund.
- Reetika Garg and Pamı Dua. 2014. Foreign Portfolio Investment Flows to India: Determinants and Analysis. *Elsevier, World Development* Vol. 59, pp. 16–28, 2014.
- <http://dx.doi.org/10.1016/j.worlddev.2014.01.030>
- Schmitz, Martin. 2009. Financial reforms and capital flows to emerging Europe. Discussion Paper 278, Dublin, Institute for International Integration Studies.
- Sumera Kirn, (2012), Modelling long run determinants of foreign portfolio investment in Nigeria, *Journal of Economics and Sustainable Development*, Vol.3, No.8.
- Tesar, L.L., Werner, I.M., 1995. Home bias and high turnover. *Journal of International Money and Finance* 14, 467–492.
- Uctum Merih and Remzi Uctum. 2011. Crises, portfolio flows, and foreign direct investment: An application to Turkey. *Economic Systems*. 35 (2011) 462–480 doi:10.1016/j.ecosys.2010.10.005.
- Verma, R., & Prakash, A. 2011. Sensitivity of capital flows to interest rate differentials: An empirical assessment for India. RBI working paper 7/2011.

- Xun Cao and Michael D. Ward. 2014. Do Democracies Attract Portfolio Investment? Transnational Portfolio Investments Modeled as Dynamic Network. *International Interactions: Empirical and Theoretical Research in International Relations*, 40:2, 216-245.
- Zivot, E., and Andrews, D.W.K. (1992), Further Evidence on the Great Crash, the Oil-Price Shock, and the Unit-Root Hypothesis. *Journal of Business & Economic Statistics*, (10), 251-270.



THE CRITICAL ROLE OF BRAND LOVE IN CLOTHING BRANDS

DOI: 10.17261/Pressacademia.201519963

Merve Ulku TURGUT¹, Beyza GULTEKIN²

¹Ufuk University. E-mail: muturgut@gmail.com

²Hacettepe University. E-mail: beyza@hacettepe.edu.tr

Keywords:

Brand love,
brand trust,
resistance to negative information,
intention to repurchase

JEL Classification:

M310

ABSTRACT

This paper aims to explore brand love in the context of brand trust, resistance to negative information and intention to repurchase in the clothing brand context. Based on a sample of 400 respondents, simple regression and multiple regression analyses were conducted to analyse direct effects and bootstrapping analyses were run to examine mediating roles. The analyses indicate a significant positive effect of brand trust on brand love, resistance to negative information, and intention to repurchase. In addition, brand love is confirmed to positively influence resistance to negative information and intention to repurchase. Concerning mediating roles, brand love is the mediator of the relation between brand trust and resistance to negative information and intention to repurchase. These results provide guidance to managers of clothing brands by disclosing the importance of brand love and brand trust. Accordingly, to have a brand customers love, managers should invest in gaining consumers' trust. Such valuable relationships eventually facilitate consumer resistance against negative information and intention to repurchase.

1. INTRODUCTION

Brands play a considerable role in consumers' decision-making processes (Fischer, Völckner and Sattler, 2010). Consumers may pay premium prices for some brands and continue to prefer these brands in time (Fischer et al., 2010). From the firms' perspective, since obtaining new consumers is more costly than maintaining current ones, firms depend on their brands to retain their consumers (Stone, Woodcock and Wilson, 1996). Furthermore, to keep their consumers, firms establish deep, long-term relations with consumers (Bennett, 1996; Acton, 1998). However, seriously high numbers of consumers obstruct firms' one-to-one relations with them (Lau and Lee, 1999), which is why firms need brands to maintain relationships with their consumers (Zboja and Voorhees, 2006). Therefore, brands would be used not only to survive in the market for a long time (Delgado-Ballester and Munuera-Alemán, 2005; Fischer et al., 2010) but also to have long-term relationships with their customers (Zboja and Voorhees, 2006).

In consumer–brand relationships, brand love is one of the deepest and most intense relationship types (Albert, Matthews-Lefevbre, Merunka and Valette-Florence, 2007). The concept of brand love therefore receives remarkable attention, both theoretically and practically (Albert et al., 2007). According to Fournier (1998), the core elements of consumer–brand relationships are love and passion. Furthermore, Kevin Roberts (2005), CEO at Saatchi & Saatchi, states that firms should focus on the brand love concept to have long-term relationships and eventually create brand loyalty. As a result, companies follow a consumer relationship strategy to turn their brand into a Lovemark. When a brand becomes a Lovemark, its company is differentiated in the market and gains a competitive advantage.

Some studies examine brand love based on interpersonal love (Carroll and Ahuvia, 2006). According to Batra, Ahuvia and Bagozzi (2012) even though interpersonal love theories are helpful in explaining the brand love concept, deeper research is necessary to better understand this concept. Moreover, although brand love is an essential type of consumer–brand relation in consumer behaviour, there is little research on this concept (Carroll and Ahuvia, 2006; Batra et al., 2012; Sarkar and Murthy, 2012; Shuv-Ami, 2012; Vlachos and Vrechopoulos, 2012; Albert and Merunka, 2013). Therefore, first, this study contributes to the literature by conducting exhaustive research on brand love. To have a good grasp on brand love, its relation to another consumer–brand relation, brand trust, should also be investigated. Trust has an influence on consumers' attitudes about brands (Chaudhuri and Holbrook, 2001). Hence, when consumers trust a brand, they are also willing to establish a love relationship with it (Albert and Merunka, 2013). To better understand the roles of these two concepts, the unique effects of brand love and brand trust dimensions are also investigated.

In addition to the relation between brand trust and brand love, the consequences of brand love need to be analysed. Brand love contributes to consumers' resistance to negative information (Batra et al., 2012) about the brand and repurchase intention (Sarkar and Murthy, 2012; Shuv-Ami, 2012; Vlachos and Vrechopoulos, 2012). Similarly, brand trust seems to increase consumers' repurchase intention (Zboja and Voorhees, 2006; Fang, Chui and Wang, 2011). Moreover, there may be a positive relation between brand trust and resistance to negative information about the brand. However, to the best of the authors' knowledge, such a relation between these two concepts has not yet been justified. Therefore, this study contributes to the literature by analysing this relation. In addition, there are few studies about consumers' resistance to negative information (e.g. Ahluvalia, Burnkrant and Unnava, 2000; Eisingerich, Rubera, Seifert and Bhardwaj, 2011). Again, to the best of our knowledge, the marketing literature does not have a model involving brand love, brand trust, resistance to negative information, and intention to repurchase. To summarize, this model will fill a remarkable gap in the literature.

Accordingly, this article aims to explore the relation between brand love and brand trust, resistance to negative information, and intention to repurchase in clothing brands. In doing so, first, the related literature is reviewed. Then, the method, analyses, and results are presented and the findings are discussed. Finally, limitations and directions for future researchers and managers are presented.

2. THEORETICAL BACKGROUND AND RESEARCH HYPOTHESES

2.1. Brand Trust

Trust is the topic of many different research areas, such as marketing, management, and economics, (Doney and Cannon, 1997), such that this construct has a very vast literature. According to Rousseau, Sitkin, Burt and Camerer (1998), trust is a willingness to be vulnerable to others' intentions and behaviours that is expected to be positive. Similarly, trust is one party's willingness to be vulnerable to another's behaviours (Mayer, Davis and Schoorman, 1995).

In the formation of trust, various concepts – namely, risk, ambiguity, the amount of information, and mutual interdependence – are critical. Trust involves risk taking to a certain extent (Mayer et al., 1995). Grabner-Kräuter and Kaluscha (2003) claim that when there is full transparency, there is no need to trust anyone. The truster's knowledge level about the situation is also an important point (McAllister, 1995). When people have an excess of knowledge or a lack of knowledge, there is no need for trust. Thus, an average amount of knowledge is required for trust. Another facet of trust is mutual interdependence (Rousseau et al., 1998). Mutual need and interest shape trust.

High competition and excessive numbers of consumers makes it difficult to establish relationships with consumers (Lau and Lee, 1999), so companies obtain help from their brands. This leads companies to use brands to develop trusting relationships with their customers (Zboja and Voorhees, 2006). Delgado-Ballester and Munuera-Alemán (2001, p. 1242) define brand trust as 'a feeling of security held by the consumer that the brand will meet his/her consumption expectations'. According to Chaudhuri and Holbrook (2001), brand trust occurs when consumers believe the brand keeps its promises. Brand trust has two dimensions: reliability and intention (Delgado-Ballester and Munuera-Alemán, 2001). Reliability concerns the brand's skills and capabilities to meet consumers' needs and desires (Delgado-Ballester, Munuera-Aleman and Yague-Guillen, 2003; Sung and Kim, 2010). The latter dimension states that brands should take into account consumers' interests and problems instead of behaving opportunistically (Doney and Cannon, 1997; Delgado-Ballester et al., 2003).

Brand trust has many advantages for companies. It is said that trust is the cornerstone of the relationships between consumers and brands (Morgan and Hunt, 1994; Garbarino and Johnson, 1999; Delgado-Ballester et al., 2003; Elliott and Yannopoulou, 2007). In addition, consumers are more prone to buy brands they trust (Chatterjee and Chaudhuri, 2005). Similarly, many empirical studies prove the positive impact of brand trust on loyalty (Lau and Lee, 1999; Chaudhuri and Holbrook, 2001; Delgado-Ballester et al., 2003; Delgado-Ballester and Munuera-Alemán, 2005; Sichtmann, 2007; Matzler, Grabner-Kräuter and Bidmon, 2008; Laroche, Habibi, Richard and Sankaranarayanan, 2012). Besides, brand trust contributes to consumers' positive word of mouth (Sichtmann, 2007). Lastly, Robert Bosch, founder of Bosch, states he 'would rather lose money than trust', emphasizing the importance of trust relative to material things.

2.2. Brand Love

Among all consumer–brand relationships in the literature, brand love seems to be the most recent and popular concept (Ahuvia, 2005; Carroll and Ahuvia, 2006; Batra et al., 2012). Carroll and Ahuvia (2006) define brand love construct as ‘the degree of passionate emotional attachment a satisfied consumer has for a particular trade name’ (p. 81). While some studies (Carroll and Ahuvia, 2006) consider brand love an emotion, others (Keh, Pang and Peng, 2007; Batra et al., 2012) regard this construct as a relationship. A love relationship, compared to the emotion of love, lasts longer. Brand love relationships between consumers and brands include long-term cognitive, emotional, and behavioural terms (Batra et al., 2012).

Many studies categorize brand love into various dimensions. According to Carroll and Ahuvia (2006), brand love is a one-dimensional construct; however, Kamat and Parulekar (2007) posit that brand love concept has five dimensions: friendship, contentment, admiration, commitment, and yearning. Albert Merunka and Valette-Florence (2008) propose 11 dimensions for brand love: passion, duration, self-congruity, dreams, memories, pleasure, attraction, uniqueness, beauty, trust, and declaration. Passion-driven behaviour, self-brand integration, positive emotional connection, long-term relationship, anticipated separation distress, and attitude valence are the six brand love dimensions presented by Bagozzi, Batra and Ahuvia (2013). Further studies are needed to better clarify the dimensions of the brand love concept. This research provides a helpful contribution to the literature and to brand managers by identifying brand love factors in the context of clothing.

Some studies (Shimp and Madden, 1988; Whang, Allen, Sahoury and Zhang, 2004) examine the brand love based on interpersonal love theories. Shimp and Madden (1988) explain the relationships formed between consumers and consumption goods on the basis of Sternberg’s (1986) triangular Theory of Love. On the other hand, Batra et al. (2012) states that Triangular Theory of Love is insufficient for understanding brand love in detail. With respect to interpersonal love, brand love is one sided (Shimp and Madden, 1988; Whang et al., 2004; Batra et al., 2012). In addition, the love relationships between consumers and brands are less important than interpersonal love (Batra et al., 2012).

Fetscherin and Conway-Dato-on (2012) claim brand love to be analogous to a parasocial relationship. In parasocial relationships, while one party has clear information about the other one, the other party has no such knowledge. Similarly, in love relationships between consumers and brands, brands are not aware of the consumers’ love. Thus, parasocial love better explains brand love (Fetscherin and Conway-Dato-on, 2010). In addition, consumers interpret their relationships with brands and with other people in two different regions of brain, proving the difference between these two relationships (Yoon, Allen, Sahoury and Zhang, 2006).

Firms want their brands to be Lovemarks (Roberts, 2005). When a brand deserves a Lovemark title, it may differ from other brands and obtain a competitive advantage in the market (Roberts, 2005). Brand love is also necessary to understand and segment consumer behaviours (Pang, Keh and Peng, 2009). Brand love has a positive impact on consumers’ intention to repurchase (Keh et al., 2007; Bergkvist and Bech-Larsen, 2010;

Batra et al., 2012; Rossiter, 2012; Shuv-Ami, 2012). Similarly, brand love positively influences brand loyalty (Carroll and Ahuvia, 2006; Bergkvist and Bech-Larsen, 2010). Brand love thus helps companies have long-term relationships with their customers (Fournier, 1998). Furthermore, when consumers love a brand, they will visit the brand's webpage (Bergkvist and Bech-Larsen, 2010). Another benefit of brand love is related to positive word of mouth. When consumers love a brand, they tend to mention its advantages and recommend it to relatives, friends, family, and so forth (Carroll and Ahuvia, 2006; Batra et al., 2012; Bergkvist and Bech-Larsen, 2010; Correia Loureiro and Kaufmann 2012; Rossiter, 2012; Shuv-Ami, 2012; Yasin and Shamim, 2013).

In interpersonal relationships, trust leads to love between people (Hazan and Shaver, 1987; Shaver, Schwartz, Kirson and O'connor, 1987). Similarly, in consumer-brand relations studies (Patwardhan and Balasubramanian, 2011; Albert and Merunka, 2013) indicate that consumers who trust a brand can also come to love it. Thus, we have the following hypothesis.

H1. Brand trust has a positive influence on brand love.

2.3. Resistance to Negative Information

During consumers' purchase decision processes, they need information about the firm and about their products or brands (Herr, Kardes and Kim, 1991). The gathered information will have an impact on consumers' attitudes and behaviours (Brown and Reingen, 1987). However, positive and negative information have different levels of influence on consumers (Fiske, 1980). Negative information has a greater impact on consumers' thoughts and behaviours about firms/brands than positive information, which is known as the negativity effect (Skowronski and Carlston, 1998). According to Pullig, Netemeyer and Biswas (2006), negative information is related to performance or value. Researchers state that performance-related negative information arises from a firm's functional activities. Problems with ironing a clothing firm's skirts and an airline company selling the same seat to more than one person are examples of performance-related negative information. Value-related negative information involves social or ethical considerations (Pullig et al., 2006). An e-mail provider's sharing users' personal information and a firm's financial assistance of terrorist organizations are examples of value-related negative information. Negative information about firms and their products or brands negatively affects financial returns (Luo, 2007, 2009). In addition, it decreases company reputation and employee morale and motivation (Kimmel and Audrain-Pontevia, 2010).

Resistance to negative information is the degree to which consumers do not let negative information negatively influence their evaluations about the firm (Eisingerich et al., 2011). Attitudes against negative information can differ among consumers. Certain consumers show resistance to negative information (Eisingerich et al., 2011). The extent of the resistance to negative information is determined by certain constructs. Specifically, satisfied customers are more resistant to negative information about the services they received (Eisingerich et al., 2011). Commitment to a firm also helps consumers to deny such negativity (Ahluwalia et al., 2000). Additionally, the more social responsibility a firm bears, the more consumers will resist pertinent negative information (Eisingerich et al.,

2011). In addition, strong consumer–brand relationships positively contribute to consumer resistance to negative information (Eisingerich et al., 2011).

Based on this, brand trust, the cornerstone of strong consumer–brand relationships (Morgan and Hunt, 1994), may increase consumer resistance to negative information. Therefore, we propose the following hypothesis:

H2. Brand trust has a positive influence on resistance to negative information.

When identification – one of the six dimensions of brand love (Batra et al., 2012) – takes place between a customer and a brand, the customer’s resistance to negative information increases (Bhattacharya and Sen, 2003). In addition, resistance to negative information is positively affected by satisfaction (Eisingerich et al., 2011) and attachment (Ahluwalia et al., 2000). Since brand love is the extent of a ‘satisfied consumer’s passionate emotional attachment’ (Carroll and Ahuvia, 2006, p. 81) for a brand, the brand love relationship between customers and brands increases consumers’ resistance to negative information (Batra et al., 2012). As a result, we have the following hypothesis:

H3. Brand love has a positive influence on resistance to negative information.

2.4. Intention to Repurchase

A repurchase is a consumer buying a particular product or brand more than once (Curtis, 2009). Intention is the extent of a person’s desires and efforts to perform an action (Ajzen, 1991). Thus, the intention to repurchase construct can be defined as ‘the individual’s judgment about buying again a designated service from the same company, taking into account his or her current situation and likely circumstances’ (Hellier, Geursen, Carr and Rickard, 2003, p. 1764). Since, customer acquisition is many times more costly than customer retention (Stone et al., 1996), intention to repurchase a brand is worthy of future consumer/firm relationships (Chung and Lee, 2003).

Trust decreases consumers’ risk perception about a product/brand (Pavlou, 2003). A consumer’s intention to repurchase a low-risk product/brand is higher than the intention to repurchase a high-risk one (Pavlou, 2003). In addition, Herbst, Hannah and Allan (2013) state that trust should be formed between a consumer and a brand prior to the consumer’s purchase of the brand. Accordingly, trust is one of the critical elements considered in the selection of a brand among alternatives, as indicated by empirical studies (Zboja and Voorhees, 2006; Fang et al., 2011). Thus, this study claims that if a consumer trusts a brand, the consumer’s intention to repurchase it raises. Thus, we propose the following hypothesis:

H4. Brand trust has a positive influence on intention to repurchase.

The brand love literature posits that brand love positively influences consumer loyalty (Carroll and Ahuvia, 2006; Bergkvist and Bech-Larsen, 2010; Batra et al., 2012; Correia Loureiro and Kaufmann, 2012). Similarly, recent studies show that intention to repurchase is the consequence of brand love (Sarkar and Murthy, 2012; Shuv-Ami, 2012; Vlachos and Vrechopoulos, 2012). Based on the above discussions, we propose that intention to repurchase is the consequence of a brand love relationship, as follows. Accordingly:

H5. Brand love has a positive influence on intention to repurchase.

Zboja and Voorhees (2006) and Fang et al. (2011) state that when consumers trust a brand, they will deny negativity about the brand. Consumers' trust towards a brand also promotes their love for it (Patwardhan and Balasubramanian, 2011; Albert and Merunka, 2013). Additionally, Batra et al. (2012) find a positive effect of brand love on consumers' resistance to negative information. On the basis of these studies, it is posited that love towards a brand mediates the relation between consumer trust in that brand and resistance to negative information about the brand. As a result, we arrive at the following hypothesis.

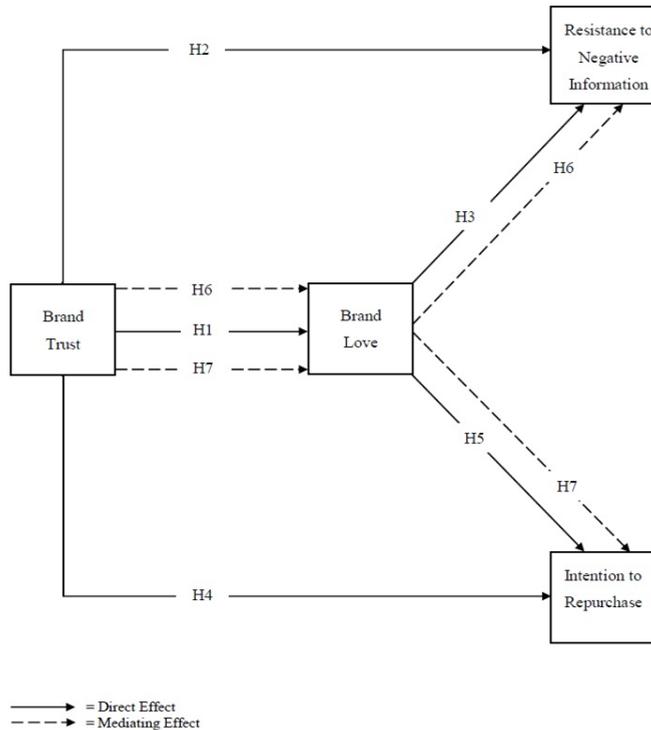
H6. Brand love mediates the relation between brand trust and resistance to negative information.

In today's market conditions, trust is not sufficient to convince consumers to buy a particular brand over time (Roberts, 2005). Consumers' intention to repurchase depends on the degree of love they have for the brand (Roberts, 2005). Zboja and Voorhees (2006) and Fang et al. (2011) note a positive association between trust and intention to repurchase, as well as a positive association of brand love with intention to repurchase. Thus, one should investigate whether the relation between brand trust and intention to repurchase is mediated by brand love. Accordingly, we propose the following hypothesis.

H7. Brand love mediates the relation between brand trust and intention to repurchase.

Figure 1 presents the research framework in light of the literature and the proposed hypotheses.

Figure 1: The Hypothesized Model



3. METHODOLOGY

3.1. Product Selection

Exploratory research was conducted on deciding on the product. A total of 30 participants were asked for the first three brands that came to mind. Of the 90 stated brands, 37, constituting the great majority, are from clothing industry, with electronics brands (13) and food/beverage brands (13) the next two most stated. Thus, clothing was selected as the product in this study. The clothing industry plays a valuable role in the Turkish economy. Turkey is the seventh biggest clothing exporter in the world and the clothing industry constitutes 7% of its gross domestic product (Republic of Turkey Ministry of Economy, 2014). Additionally, 5.4% of household expenditures are clothing (Turkish Statistical Institute, 2013). Thus, this research will contribute to the development of the clothing industry.

3.2. Data Collection and Measures

A questionnaire was used for the survey. The convenience sampling method was used to collect data from 400 participants (Turgut, 2014). A total of 57.2% of the respondents were female and the majority (67.2%) ranged in age from 18 to 25 years; 69.5% were middle-income respondents and 68% of them held a bachelor’s degree. Instead of a specific clothing brand or brands, the questionnaire asked respondents to answer based on clothing brands they favoured and had bought before. The first reason behind this was

to have a broad, random list of brands. The second reason was to avoid influencing the participants' choices.

The measurements for brand love were adapted from those of Bagozzi et al. (2013), for a total of 27 items. The brand trust scale of Bagozzi et al. (2013) was also modified to comprise 10 items. Resistance to negative information was adapted from Eisingerich et al. (2010) and was measured by two items. Intention to repurchase was assessed by three items adapted from Parasuraman Zeithaml and Malhotra (2005) and Pavlou and Fygenon (2006). Except for two items of brand love, which were measured by semantic differentiation, all the items were measured by five-point Likert-type scales with the anchors strongly disagree (one) and strongly agree (five). A complete list of the measurement items is provided in the Appendix.

3.3. Analyses and Results

Exploratory factor analysis (EFA) with principal component analysis using varimax rotation was applied to the brand trust scale to examine its factor structure. Barlett's test of sphericity and the Keiser–Meyer–Olkin (KMO) value of sampling adequacy indicate no collinearity between the items and an adequate sample size for analysis (Barlett's test significant at $p < 0.001$, KMO = 0.886). Accordingly, two factors were determined to explain 66.68% of the variance of the total set of variables. Based on the literature (Doney and Cannon, 1997; Delgado-Ballester and Munuera-Alemán, 2001), these two factors were called credibility (BT1, BT2, BT3, BT4, and BT5) and benevolence (BT6, B7, BT8, BT9, and BT10). Table 1 provides the results from the EFA of the brand trust facets.

Table 1: Reliability values, factor loadings, and explained variance values for the brand trust scale

Items	Factors	
	1	2
Credibility (Cronbach's Alpha: 0.82)		
BT1. I trust this brand.	0.850	
BT2. This brand meets my expectations.	0.805	
BT3. I feel confidence in this brand.	0.692	
BT4. This is a brand name that never disappoints me.	0.619	
BT5. This brand name guarantees satisfaction.	0.529	
Benevolence (Cronbach's Alpha: 0.90)		
BT6. If I had a complaint related to this brand or one of their products, they would be honest in addressing my concerns.		0.854
BT7. If I had a complaint related to this brand or one of their products, they would be sincere in addressing my concerns.		0.886
BT8. If I had a problem related to this brand or one of their products, I could rely on it to solve it.		0.852
BT9. This brand would make every effort to satisfy me.		0.674
BT10. If I had a problem related to this brand or one of their products, which could not readily be resolved, it would compensate me in some way for the problem.		0.764
Eigenvalue	5.37	1.29

Explained Variance	38.13%	28.54%
Total Explained Variance	38.13%	66.68%

Confirmatory factor analysis was performed to determine the appropriateness of this two-factor solution and the distribution of the scale items. Based on the modification index suggestions, error covariances between BT1 and BT2 and between BT6 and BT7 were described. Subsequently, the model was found to fit well with the data ($\chi^2/df = 3.17$, RMSEA = 0.07, GFI = 0.95, and CFI = 0.97). Reliability analyses were conducted to ensure the internal consistency of the dimensions of brand trust. Accordingly, brand trust dimensions have high internal consistency (Table 1).

Since brand love is quite a new concept in the literature, EFA was conducted to clarify the dimensions of this concept. Principal component analysis with varimax rotation was used for the EFA. Bartlett's test of sphericity was significant ($p < 0.001$, KMO measure of sampling adequacy 0.884) and showed no collinearity between the items and adequate sample size for the analysis. The results show high cross-loading for BL18 and BL19 (see the Appendix 1). Thus, after these two items were excluded, the EFA was run with the remaining 25 items. Accordingly, six factors were determined, called life meaning, self-brand integration, long-lasting connection, passion-driven behaviour, anticipated separation distress, and attitude valence. Reliability values, factor loadings, and explained variance values of brand love scale are reported in Appendix 2.

Confirmatory factor analysis was conducted to determine whether the six factors suggested by EFA would fit the data. After the modification indices were examined and content analysis was performed on the items, error covariances between the items were added based on the modification indices (BL1–BL2, BL6–BL7, BL8–BL9, BL10–BL11, BL12–BL13, BL14–BL15, BL16–BL17, and BL20–BL21). Therefore, after modification, the six-factor model fits the data ($\chi^2/df = 2.63$, RMSEA = 0.06, GFI = 0.88, CFI = 0.93). Reliability analyses were conducted to ensure the internal consistency of the research constructs. As seen in Table 1, brand love's dimensions' Cronbach's alpha values have high internal consistency.

Hypotheses for direct relations were tested by regression analysis. Table 3 reports the reliability values, descriptive statistics, and correlations for the variables before hypothesis testing. As Table 3 shows, the overall reliabilities of the constructs are also satisfactory

Table 3: Reliability values, descriptive statistics, and correlations for the variables

Variables	Cronbach's Alpha	Mean	Std. Dev.	1	2	3	4
1. Brand Trust	0.90	3.48	0.64	1			
2. Brand Love	0.92	3.08	0.70	0.66*	1		
3. Resistance to Negative Information	0.74	3.04	0.91	0.50*	0.52*	1	
4. Intention to Repurchase	0.82	3.19	1.03	0.53*	0.54*	0.36*	1

* $p < 0.01$

To obtain a clear understanding about brand love, the relation between brand love and the other constructs – namely, brand trust, resistance to negative information, and intention to repurchase – is first analysed at the construct level (overall brand love and overall brand trust) and then at the dimensional level (brand love dimensions and brand trust dimensions). As Albert and Merunka (2013) state, dimensions of brand trust and brand love can be either affective or cognitive. This means the unique roles of the dimensions need to be analysed. Such an approach is therefore also more informative about the specific roles of brand love and brand trust.

Accordingly, regression analyses were performed to test the direct impact of brand trust on brand love. The results show that brand trust ($\beta = 0.66$; $p < 0.001$) significantly and positively contribute to brand love ($R^2 = 0.435$; $F = 306.799$; $p < 0.001$). This means brand trust plays a strong role in developing consumer love towards a brand. Hence, H1 is supported. Regarding the dimensions, credibility ($\beta = 0.501$; $p < 0.001$) and benevolence ($\beta = 0.231$; $p < 0.001$) both have significant and positive impacts on brand love ($R^2 = 0.448$; $F = 162.839$; $p < 0.001$).

Multiple regression analysis was performed to test the influences of brand trust and brand love on resistance to negative information. As a result, brand trust ($\beta = 0.286$; $p < 0.001$) and brand love ($\beta = 0.339$; $p < 0.001$) both have significant positive impacts on resistance to negative information ($R^2 = 0.321$; $F = 95.274$; $p < 0.001$). So, H2 and H3 are supported.

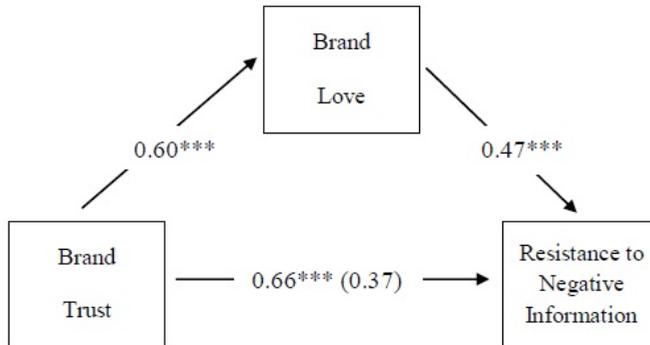
Concerning dimensions, the benevolence dimension ($\beta = 0.227$; $p < 0.001$) of brand trust and life meaning and the value given dimension of brand love ($\beta = 0.258$; $p < 0.001$) influence consumers' resistance to negative information ($R^2 = 0.333$; $F = 25.881$; $p < 0.001$). On the other hand, the credibility dimension of brand trust and self-brand integration, long-lasting connection, passion-driven behaviour, anticipated separation distress, and the attitude valence dimension of brand love do not have significant impacts on resistance to negative information ($p > 0.05$).

Multiple regression analysis was conducted to test the impacts of brand trust and brand love on intention to repurchase. Accordingly, brand trust ($\beta = 0.321$; $p < 0.001$) and brand love ($\beta = 0.328$; $p < 0.001$) significantly and positively influence intention to repurchase ($R^2 = 0.347$; $F = 106.859$; $p < 0.001$). Therefore, H4 and H5 are supported. Both credibility ($\beta = 0.149$; $p < 0.05$) and benevolence ($\beta = 0.160$; $p < 0.05$) positively affect intention to repurchase; the passion-driven behaviour ($\beta = 0.199$; $p < 0.001$) and attitude valence ($\beta = 0.116$; $p < 0.05$) dimensions of brand love positively influence consumers' intention to repurchase ($R^2 = 0.353$; $F = 28.256$; $p < 0.001$), whereas the brand love dimensions life meaning and value given, self-brand integration, long-lasting connection, and anticipated separation distress do not significantly influence intention to repurchase.

Bootstrapping was carried out to examine the mediating hypotheses, namely, H6 and H7. Bootstrapping allows for the testing of mediation (Preacher and Hayes, 2008). As Hayes (2009) recommends, 1,000 resamples were used and these generated a 95% confidence interval for the mediator. According to Hayes (2009), if zero falls outside this interval, mediation can be said to be present. The mediation model of brand love on the relation

between brand trust and resistance to negative information is given in Figure 2. The bootstrapping analysis revealed that the 95% confidence interval for the magnitude of the mediating effect ($a*b = 0.28$) excluded zero ([0.19, 0.39]). This means brand love has a mediating effect ($p < 0.001$) on the relation between brand trust and resistance to negative information.

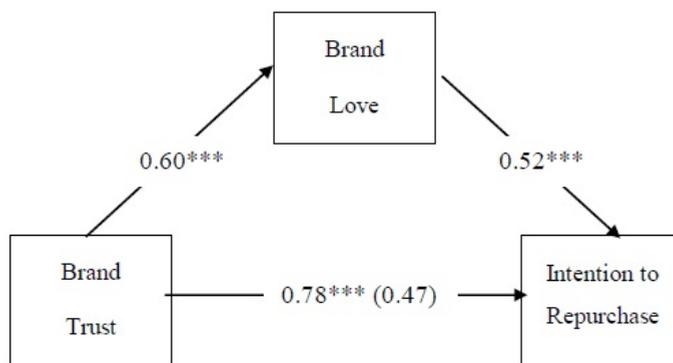
Figure 2: Mediating Role of Brand Love in the Relation Between Brand Trust and Resistance to Negative Information



*** $p < 0.001$

Another proposed mediating role of brand love is that of the relation between brand trust and intention to repurchase. The results for this mediating effect are given in Figure 3. A bootstrapped estimate (Preacher and Hayes, 2008) revealed the mediating effect ($a*b = 0.31$) of brand love on the relation between brand trust and intention to repurchase was significant ([0.22, 0.43]; $p < 0.001$). Thus, H7 is supported.

Figure 3: Mediating Role of Brand Love in the Relation Between Brand Trust and Intention to Repurchase



*** $p < 0.001$

The results of the hypotheses are given in Table 4. Accordingly, all the hypotheses proposed are supported.

Table 4: Research hypothesis results

Hypotheses	Results
H1. Brand trust has a positive influence on brand love.	Supported
H2. Brand trust has a positive influence on resistance to negative information.	Supported
H3. Brand love has a positive influence on resistance to negative information.	Supported
H4. Brand trust has a positive influence on intention to repurchase	Supported
H5. Brand love has a positive influence on intention to repurchase.	Supported
H6. Brand love mediates the relation between brand trust and resistance to negative information.	Supported
H7. Brand love mediates the relation between brand trust and intention to repurchase.	Supported

4. CONCLUSION AND IMPLICATIONS

The purpose of this research is to assess the relation between brand love and brand trust, resistance to negative information, and intention to repurchase in clothing brands. Compared to previous studies about the brand love construct, this study has three obvious originalities. First, to the best of our knowledge, this is the first study to investigate the brand love construct in a clothing brand context.

Therefore, the results of this study reveal several insights about brand love in clothing brands. This study's originality also concerns resistance to negative information. Second, this study focused on the dimensions of brand trust and brand love, investigating their unique effects. Third, this study differs from other brand love studies by investigating its mediating role in the relation between brand trust and resistance to negative information, as well as intention to repurchase. Finally, this study found a notable link between consumers' trust in a brand and resistance to negativity about it.

Brand trust is found to exert a significantly positive effect on brand love. This result is consistent with previous studies (Patwardhan and Balasubramanian, 2011; Albert and Merunka, 2013). Indeed, when consumers rely on a clothing brand's promises and activities, a love relationship is easily established. In addition, consumers' trust in a brand increases their resistance to negative information about the brand. Therefore, consumers resist negativity about brands through their perceived reliance and credibility. Similarly, as Batra et al. (2012) indicate, consumers resist negative information about brands with which they have love relationships. Specifically, the benevolence dimension of brand trust and the life meaning and value given dimensions of brand love influence consumer resistance to negative information.

In addition to these findings, brand trust is found to reinforce consumers' intention to repurchase. This result supports the findings of Zboja and Voorhees (2006) and Fang et al. (2011). Beyond brand trust, based on previous complementary findings (Sarkar and Murthy, 2012; Shuv-Ami, 2012; Vlachos and Vrechopoulos, 2012), the love consumers feel for a brand also enables them to prefer the brand more than once. Regarding dimensions, the brand trust dimensions of credibility and benevolence positively influence intention to

repurchase. The brand love dimensions of passion-driven behaviour and attitude valence have positive impacts on consumer intention to repurchase.

Besides direct relations, this research investigated the mediating roles of brand love. The results indicate brand trust has positive indirect effects on resistance to negative information and intention to repurchase through the brand love construct. This study therefore provides a nuanced interpretation using such mediating roles of brand love.

Beyond its theoretical contributions, this study also provides managerial guidance for brand managers. Specifically, its findings show that brand trust is positively associated with brand love. This means that if brand managers succeed in capturing a consumer's trust in a brand, this will foster a love relationship between the consumer and that brand. Therefore, to develop brands that are loved, managers should invest in learning about consumers' desires and expectations and meet these through brand activities related to advertising and other promotion mix elements. Managers can conduct customer surveys before and after transactions. In addition, to develop a trusted brand, firms should promptly fulfil their promises and not disappoint customers. Skills and knowledge are critical in trust as well. Brand trust also contributes to consumer resistance to negative information and intention to repurchase. So, these recommendations are expected to also facilitate the process of fostering consumers' resistance to negative information and their intention to repurchase.

This study's findings provide evidence that brand love is a crucial construct in understanding consumers' attitudes and intentions. Specifically, as Fournier (1998) states, love and passion are at the centre of all consumer-brand relationships. Thus, managers should be aware of the importance of love relationships. Accordingly, they should attempt to facilitate conditions for a strong love relationship between their customers and brands. For example, they may produce products that consumers feel close to or find something that relates to their personality. Companies can design products to help consumers feel the way they want. Stylish products would be one way of meeting this goal. Batra et al. (2012) claim that if consumers believe a brand makes their life meaningful and worthwhile, they may feel love towards this brand. Participating in social responsibility projects or producing eco-friendly products would fulfil this goal. Passion is another facet of brand love (Carroll and Ahuvia, 2006). Companies may therefore focus on attractiveness, from a product's packaging to its advertising. Using celebrities in advertising would increase consumer passion for a brand. Frequency of interaction between consumers and brands is another way of creating positive consumer emotions towards brands (Patwardhan and Balasubramanian, 2011). Thus, firms can benefit from social media or e-mail to share news and the latest innovations. They may also celebrate customers' special events, such as their birthdays. Lastly, as Roberts (2005) recommends, companies should earn their customers' respect to create brand love. Quelch and Jocz (2011, p. 36) note, however, that 'the word *respect* rarely appears in connection with marketing', and suggest that companies can show respect for their customers by 'listening; informing; acknowledging; being truthful; treating someone with dignity, courtesy, and kindness; or not taking advantage of someone with less power' (p. 38).

All of these suggestions facilitate brand love, leading to resistance to negative information and eventually intention to repurchase. To sum up, this study's findings have worthwhile marketing implications for firms wishing to understand the importance of brand love and its precursors and results.

5. LIMITATIONS AND DIRECTIONS

Brand love is said to be strongly related to products such as shoes, cars, watches, and cigarettes (Albert et al., 2008). Hence, this research model could be tested on these products. Additionally, this research focused on brands. Therefore, investigation of a particular product, store, or even service (e.g., a university) would provide further insight into brand love and other constructs. The questionnaire asked participants to specify a brand of clothing they had previously bought. It was observed that some respondents spent redundant time and effort responding to this request. Future research could therefore resolve this issue by providing a list of brands.

Resistance to negative information is a recent marketing construct. So, future research could focus on this consumer attitude. According to Pullig et al., (2006) there are two types of negative information: performance related and value related. Thus, the role of these types of negative information in consumer resistance could be examined.

Another possible avenue for future research is the investigation of the moderating role of demographic factors, such as age, gender, and income, in the relation between brand love and other variables in the research model. Thus, the role of gender in consumer brand love could be analysed.

Additionally, Vlachos and Vrechopoulos (2012) claim that the consumer trait of romanticism is related to brand love. The role of romanticism in the present model could therefore be investigated. Concerning consumer characteristics, the big five personality traits – namely openness, conscientiousness, agreeableness, extraversion, and neuroticism (McCrae and Costa, 1991) – would also be beneficial in understanding consumers' attitudes and intentions. The brand love relationship could be analysed across convenience, specialty, and shopping goods (Copeland, 1923).

REFERENCES

- Acton, V. (1998), The Role of Branding in Health Care, *Managed Care Quarterly*, 6(4), p.15-19.
- Ahluwalia, R., Burnkrant, R. E. and Unnava, H. R. (2000), Consumer response to negative publicity: The moderating role of commitment, *Journal of Marketing Research*, 37(2), p.203-214.
- Ahuvia, A. C. (2005), Beyond the extended self: Loved objects and consumers' identity narratives, *Journal of Consumer Research*, 32(1), p.171-184.

- Ajzen, I. (1991), The theory of planned behaviour, *Organization Behaviour and Human Decision Process*, 50, p.179-211.
- Albert N., Boyer J., Matthews-Lefevbre, C., Merunka, D. and Valette-Florence, P. (2007), What Does Loving A Brand Really Mean? A Study of French Consumers Love Affairs, Working Paper, Colloque International de Marketing, La Londe Les Maures.
- Albert, N., Merunka, D. and Valette-Florence, P. (2008), When consumers love their brands: Exploring the concept and its dimensions, *Journal of Business Research*, 61(10), p.1062-1075.
- Albert, N. and Merunka, D. (2013), The role of brand love in consumer-brand relationships, *Journal of Consumer Marketing*, 30(3), p.258-266.
- Bagozzi, R. P., Batra, R. and Ahuvia, A. C. (2013), Brand Love: Development of an Operational Scale and Answers to Unaddressed Questions, Working Paper, University of Michigan, Ann Arbor, MI.
- Batra, R., Ahuvia, A. and Bagozzi, R. P. (2012), Brand love, *Journal of Marketing* 76(2), p.1-16.
- Bennett, R. (1996) Relationship formation and governance in consumer markets: transactional analysis versus the behaviourist approach, *Journal of Marketing Management*, 12(5), p.417-436.
- Bergkvist, L. and Bech-Larsen, T. (2010), Two studies of consequences and actionable antecedents of brand love, *Journal of Brand Management*, 17(7), p.504-518.
- Bhattacharya, C. B. and Sen, S. (2003), Consumer-company identification: A framework for understanding consumers' relationships with companies, *Journal of Marketing*, 67(2), p.76-88.
- Brown, J. J. and Reingen, P. H. (1987), Social ties and word-of-mouth referral behaviour, *Journal of Consumer Research*, 14(3), p.350-362.
- Carroll, B. A. and Ahuvia, A. C. (2006), Some antecedents and outcomes of brand love, *Marketing Letters*, 17(2), p.79-89.

- Chatterjee, S. C. and Chaudhuri, A. (2005), Are trusted brands important?, *Marketing Management Journal*, 15(1).
- Chaudhuri, A. and Holbrook, M. B. (2001), The chain of effects from brand trust and brand affect to brand performance: The role of brand loyalty, *The Journal of Marketing*, p.81-93.
- Chung, I. K. and Lee, M. M. (2003), A study of influencing factors for repurchase intention in internet shopping malls, *Proceedings of the Symposium on Parallel and Distributed Processing*, 2003.
- Copeland, M. T. (1923), Relation of consumers' buying habits to marketing methods, *Harvard Business Review*, 1(3), p.282-289.
- Correia Loureiro, S. M. and Kaufmann, H. R. (2012), Explaining love of wine brands, *Journal of Promotion Management*, Vol. 18(3), p.329-343.
- Cronbach, L. J. (1951), Coefficient alpha and the internal structure of tests, *Psychometrika*, 16(3), p.297-334.
- Curtis, T. (2009), Customer satisfaction, loyalty, and repurchase: Meta-analytical review, and theoretical and empirical evidence of loyalty and repurchase differences, Nova Southeastern University, Lakeland, Florida.
- Delgado-Ballester, E. and Munuera-Alemán, J. L. (2001), Brand trust in the context of consumer loyalty, *European Journal of Marketing*, 35(11/12), p.1238-1258.
- Delgado-Ballester, E., Munuera-Alemán, J. L. and Yague-Guillen, M. J. (2003), Development and validation of a brand trust scale, *International Journal of Market Research*, 45(1), p.35-54.
- Delgado-Ballester, E. and Munuera-Alemán, J. L. (2005), Does brand trust matter to brand equity?, *Journal of Product and Brand Management*, 14(3), p.187-196.
- Doney, P. M. and Cannon, J. P. (1997), An examination of the nature of trust in buyer-seller relationships, *Journal of Marketing*, 61(2), p.35-51.
- Eisingerich, A. B., Rubera, G., Seifert, M. and Bhardwaj, G. (2011), Doing good and doing better despite negative information? The role of corporate social

responsibility in consumer resistance to negative information, *Journal of Service Research*, 14(1), p.60-75.

- Elliott, R. and Yannopoulou, N. (2007), The nature of trust in brands: A psychosocial model, *European Journal of Marketing*, 41(9/10), p.988-998.
- Fang, Y. H., Chiu, C. M. and Wang, E. T. (2011), Understanding customers' satisfaction and repurchase intentions: An integration of IS success model, trust, and justice, *Internet Research*, 21(4), p.479-503.
- Fetscherin, M. and Conway-Dato-on, M. (2010), Brand love: Interpersonal love or parasocial love, http://www.brand-management.usi.ch/Abstracts/Monday/BrandrelationshipIII/Monday_BrandrelationshipIII_Fetscherin.pdf, accessed 25 June 2014.
- Fischer, M., Völckner, F. and Sattler, H. (2010), How important are brands? A cross-category, cross-country study, *Journal of Marketing Research*, 47(5), p.823-839.
- Fiske, S. T. (1980), Attention and weight in person perception: The impact of negative and extreme behaviour, *Journal of Personality and Social Psychology*, 38(6), p.889.
- Fournier, S. (1998), Consumers and their brands: Developing relationship theory in consumer research, *Journal of Consumer Research*, 24(4), p.343-353.
- Garbarino, E. and Johnson, M. S. (1999), The different roles of satisfaction, trust, and commitment in customer relationships, *Journal of Marketing*, 63(2), p.70-87.
- Grabner-Kräuter, S. and Kaluscha, E. A. (2003), Empirical research in on-line trust: A review and critical assessment, *International Journal of Human-Computer Studies*, 58(6), p.783-812.
- Hayes, A. F. (2009), Beyond Baron and Kenny: Statistical mediation analysis in the new millennium, *Communication Monographs*, 76(4), p.408-420.
- Hazan, C. and Shaver, P. (1987), Romantic love conceptualized as an attachment process, *Journal of Personality and Social Psychology*, 52(3), p.511.

- Hellier, P. K., Geursen, G. M., Carr, R. A. and Rickard, J. A. (2003), Customer repurchase intention: A general structural equation model, *European Journal of Marketing*, 37(11/12), p.1762-1800.
- Herbst, K. C., Hannah, S. T. and Allan, D. (2013), Advertisement disclaimer speed and corporate social responsibility: "Costs" to consumer comprehension and effects on brand trust and purchase intention, *Journal of Business Ethics*, 117(2), p.297-311.
- Herr, P. M., Kardes, F. R. and Kim, J. (1991), Effects of word-of-mouth and product-attribute information on persuasion: An accessibility-diagnostics perspective, *Journal of Consumer Research*, 17(4), p.454.
- Kamat, V. and Parulekar, A. A. (2007), Brand love - The precursor to loyalty, *Advertising and Consumer Psychology: New Frontiers in Branding; Attitudes, Attachments, Relationships*, p.94-95.
- Keh, H. T., Pang, J. and Peng, S. (2007), Understanding and measuring brand love. *Proceedings of the Conference on Advertising and Consumer Psychology, New Frontiers in Branding: Attitudes, Attachments, and Relationships; 7-9 June 2007, Santa Monica, CA. National Bureau of Economic Research, Columbia University Press.*
- Kimmel, A. J. and Audrain-Pontevia, A. F. (2010), Analysis of commercial rumors from the perspective of marketing managers: Rumor prevalence, effects, and control tactics, *Journal of Marketing Communications*, 16(4), p.239-253.
- Laroche, M., Habibi, M. R., Richard, M. O. and Sankaranarayanan, R. (2012), The effects of social media based brand communities on brand community markers, value creation practices, brand trust and brand loyalty, *Computers in Human Behavior*, 28(5), p.1755-1767.
- Lau, G. T. and Lee, S. H. (1999), Consumers' trust in a brand and the link to brand loyalty, *Journal of Market-Focused Management* 4(4), p.341-370.
- Luo, X. (2007), Consumer negative voice and firm-idiosyncratic stock returns, *Journal of Marketing*, 71(3), p.75-88.

- Luo, X. (2009), Quantifying the long-term impact of negative word of mouth on cash flows and stock prices, *Marketing Science*, 28(1), p.148-165.
- Matzler, K., Grabner-Kräuter, S. and Bidmon, S. (2008), Risk aversion and brand loyalty: The mediating role of brand trust and brand affect, *Journal of Product and Brand Management*, 17(3), p.154-162.
- Mayer, R. C., Davis, J. H. and Schoorman, F. D. (1995), An integrative model of organizational trust, *Academy of Management Review*, 20(3), p.709-734.
- McAllister, D. J. (1995), Affect-and cognition-based trust as foundations for interpersonal cooperation in organizations, *Academy of Management Journal*, 38(1), p.24-59.
- McCrae, R. R. and Costa, P.T. (1991), Adding liebe und arbeit: The full five-factor model and well-being, *Personality and Social Psychology Bulletin*, 17(2), p.227-232.
- Morgan, R. M. and Hunt, S. D. (1994), The commitment-trust theory of relationship marketing, *Journal of Marketing*, 58(3), p.20-38.
- Pang, J., Keh, H. T. and Peng, S. (2009), Effects of advertising strategy on consumer-brand relationships: A brand love perspective, *Frontiers of Business Research in China*, 3(4), p.599-620.
- Patwardhan, H. and Balasubramanian, S. K. (2011), Brand romance: A complementary approach to explain emotional attachment toward brands, *Journal of Product and Brand Management*, 20(4), p.297-308.
- Parasuraman, A. Zeithaml, V. A. and Malhotra, A. (2005), ES-QUAL a multiple-item scale for assessing electronic service quality, *Journal of Service Research*, 7(3), p.213-233.
- Pavlou, P. A. (2003), Consumer acceptance of electronic commerce: Integrating trust and risk with the technology acceptance model, *International Journal of Electronic Commerce*, 7(3), p.101-134.
- Pavlou, P. A. and Fygenon, M. (2006), Understanding and predicting electronic commerce adoption: An extension of the theory of planned behaviour, *MIS Quarterly*, p.115-143.

- Preacher, K. J. and Hayes, A. F. (2008), Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models, *Behavior Research Methods*, 40(3), p.879-891.
- Pullig, C., Netemeyer, R. G. and Biswas, A. (2006), Attitude basis, certainty, and challenge alignment: A case of negative brand publicity, *Journal of the Academy of Marketing Science*, 34(4), p.528-542.
- Quelch, J. A. and Jocz, K. E. (2011), Respect your customers, *Leader to Leader*, 2011(61), p.36-42.
- Republic of Turkey Ministry of Economy (2014), Hazır Giyim Sektörü, <http://www.ibp.gov.tr/pg/sectorpdf/sanayi/hazirgiyim.pdf>, accessed 25 June 2014.
- Roberts, K. (2005), *Lovemarks: The Future Beyond Brands*, New York, NY: PowerHouse Books.
- Rossiter, J. R. (2012), A new C-OAR-SE-based content-valid and predictively valid measure that distinguishes brand love from brand liking, *Marketing Letters*, 23(3), p.905-916.
- Rousseau, D. M., Sitkin, S. B., Burt, R. S. and Camerer, C. (1998), Not so different after all: A cross-discipline view of trust, *Academy of Management Review*, 23(3), p.393-404.
- Sarkar, A. and Murthy, B. K. (2012), Understanding and measuring romantic brand love, *Journal of Customer Behaviour*, 11(4), p.324-347.
- Shaver, P., Schwartz, J., Kirson, D. and O'connor, C. (1987), Emotion knowledge: Further exploration of a prototype approach, *Journal of Personality and Social Psychology*, 52(6), p.1061.
- Shimp, T. A. and Madden, T. J. (1988), Consumer-object relations: A conceptual framework based analogously on Sternberg's triangular theory of love, *Advances in Consumer Research*, 15(1), p.163-168.
- Shuv-Ami, A. (2012), The impact of love and quality on brand satisfaction and intentions, <http://www.anzmac.info/conference/2011/Papers%20by%20Track/Track%2004>.

%20Consumer%20Behaviour/Shuv-Ami,%20Avichai%20192.pdf, accessed 24 June 2014.

- Sichtmann, C. (2007), An analysis of antecedents and consequences of trust in a corporate brand, *European Journal of Marketing*, 41(9/10), p.999-1015.
- Skowronski, J. J., Carlston, D. E., Mae, L. and Crawford, M. T. (1998), Spontaneous trait transference: Communicators take on the qualities they describe in others, *Journal of Personality and Social Psychology*, 74(4), p.837.
- Sternberg, R. J. (1986), A triangular theory of love, *Psychological Review*, 93(2), p.119.
- Stone, M., Woodcock, N. and Wilson, M. (1996), Managing the change from marketing planning to customer relationship management, *Long Range Planning*, 29(5), p.675-683.
- Sung, Y. and Kim, J. (2010), Effects of brand personality on brand trust and brand affect, *Psychology and Marketing*, 27(7), p.639-661.
- Turgut, M. (2014), Marka Sevgisinin Marka Güveni, Olumsuz Bilgiye Karşı Direnç ve Tekrar Satın Alma Niyeti Çerçevesinde İncelenmesi, Hacettepe Üniversitesi, Sosyal Bilimler Enstitüsü, Yayınlanmamış Yüksek Lisans Tezi, Ankara.
- Turkish Statistical Institute. (2013), Hanehalkı Tüketim Harcaması, 2012, <http://www.tuik.gov.tr/PreHaberBultenleri.do?id=13579>, accessed 25 June 2014.
- Vlachos, P. A. and Vrechopoulos, A. P. (2012), Consumer–retailer love and attachment: Antecedents and personality moderators, *Journal of Retailing and Consumer Services*, 19(2), p.218-228.
- Whang, Y. O., Allen, J., Sahoury, N. and Zhang, H. (2004), Falling in love with a product: The structure of a romantic consumer-product relationship, *Advances in Consumer Research*, 31(1), p.320-327.
- Yasin, M. and Shamim, A. (2013), Brand Love: mediating role in purchase intentions and word-of-mouth, *Journal of Business and Management*, 7(2), p.101-109.

- Yoon, C., Gutchess, A. H., Feinberg, F. and Polk, T. A. (2006), A functional magnetic resonance imaging study of neural dissociations between brand and person judgments, *Journal of Consumer Research*, 33(1), p.31-40.
- Zboja, J. J. and Voorhees, C. M. (2006), The impact of brand trust and satisfaction on retailer repurchase intentions, *Journal of Services Marketing*, 20(6), p.381-390.

APPENDIX 1

Constructs and scale items

Brand trust – adapted from Bagozzi et al. (2013)

(5-point Likert scale: '1' strongly disagree and '5' strongly agree)

I trust this brand.

This brand meets my expectations.

I feel confidence in this brand.

This is a brand name that never disappoints me.

This brand name guarantees satisfaction.

If I had a complaint related to this brand or one of their products, they would be honest in addressing my concerns.

If I had a complaint related to this brand or one of their products, they would be sincere in addressing my concerns.

If I had a problem related to this brand or one of their products, I could rely on it to solve it.

This brand would make every effort to satisfy me.

If I had a problem related to this brand or one of their products, which could not readily be resolved, it would compensate me in some way for the problem.

Brand Love – adapted from Bagozzi et al. (2013)

(5-point Likert scale: '1' strongly disagree and '5' strongly agree)

- Wearing of this brand says something 'true' about who I am as a person.
- Wearing of this brand says something 'deep' about who I am as a person.
- This brand is an important part of how I see myself.
- This brand makes me look like I want to look.
- This brand makes me feel like I want to feel.
- This brand does something that makes my life more meaningful.
- This brand contributes something towards making my life worth living.
- I find myself thinking about this brand.
- I find that this brand keeps popping into my head.
- I desire to wear this brand's clothing.
- I am longing to wear this brand's clothing.
- I have interacted with this brand in the past.
- I have been involved with this brand in the past.
- I am willing to spend a lot of money improving and fine-tuning a product from this brand after I buy it.
- I am willing to spend a lot of time improving and fine-tuning a product from this brand after I buy it.
- I feel there is a natural "fit" between this brand and I.
- This brand seems to fit my own tastes perfectly.
- I feel emotionally connected to this brand.
- I feel I have a "bond" with this brand.
- This brand is fun.
- This brand is exciting.
- I believe that I will be wearing this brand for a long time.
- I expect that this brand will be part of my life for a long time to come.
- If this brand goes out of existence, I feel anxiety.
- If this brand goes out of existence, I feel apprehension.

(5-point semantic differential scale)

Negative	1	2	3	4	5	Positive
Unfavorable	1	2	3	4	5	Favorable

Resistance to Negative Information – adapted from Eisingerich et al. (2010)

(5-point Likert scale: '1' strongly disagree and '5' Strongly agree)

- Negative information about this brand does not change my general view of the brand.
- Negative information about this brand has no effect on me.

Intention to Repurchase – adapted from Pavlou and Fygenon (2006) and Parasuraman et al. (2005)

(5-point Likert scale: '1' strongly disagree and '5' strongly agree)

- I intend to repurchase this brand in future.
- I plan to repurchase this brand in future.
- I consider this brand as my first choice.

APPENDIX 2**Reliability values, factor loadings, and explained variance values for the brand love scale**

Items	Factors					
	1	2	3	4	5	6
Life Meaning (Cronbach's Alpha: 0.88)						
BL6. This brand does something that makes my life more meaningful.	0.636					
BL7. This brand contributes something towards making my life worth living.	0.609					
BL8. I find myself thinking about this brand.	0.803					
BL9. I find that this brand keeps popping into my head.	0.786					
BL14. I am willing to spend a lot of money improving and fine-tuning a product from this brand after I buy it.	0.724					
BL15. I am willing to spend a lot of time improving and fine-tuning a product from this brand after I buy it.	0.763					
Self-Brand Integration (Cronbach's Alpha: 0.87)						
BL1. Wearing this brand says something 'true' about who I am as a person.		0.787				
BL2. Wearing this brand says something 'deep' about who I am as a person.		0.763				
BL3. This brand is an important part of how I see myself.		0.764				
BL4. This brand makes me look like I want to look.		0.741				
BL5. This brand makes me feel like I want to feel.		0.661				
Long-Lasting Connection (Cronbach's Alpha: 0.81)						
BL16. I feel there is a natural fit between this brand and I.			0.418			
BL17. This brand seems to fit my own tastes perfectly.			0.528			
BL20. This brand is fun.			0.767			
BL21. This brand is exciting			0.743			
BL22. I believe that I will be wearing this brand for a long time.			0.593			
BL23. I expect that this brand will be part of my life for a long time to come.			0.566			
Passion-Driven Behaviour (Cronbach's						

Alpha: 0.78)

BL10. I desire to wear this brand’s clothing. 0.542

APPENDIX 2: Continued...

Items	Factors					
	1	2	3	4	5	6
BL11. I am longing to wear this brand’s clothing.				0.633		
BL12. I have interacted with this brand in the past.				0.750		
BL13. I have been involved with this brand in the past.				0.780		
Anticipated Separation Distress (Cronbach’s Alpha: 0.91)						
BL24. If this brand goes out of existence, I feel anxiety.					0.873	
BL25. If this brand goes out of existence, I feel apprehension.					0.865	
Attitude Valence (Cronbach’s Alpha: 0.75)						
BL26. Negative– positive						0.808
BL27. Unfavorable – favorable						0.847
Eigenvalue	9.10	2.45	1.76	1.27	1.08	1.08
Explained Variance	16.0%	14.4%	11.3%	9,8%	7.8%	7.4%
Total Explained Variance	16.0%	30.4%	41.8%	51.7%	59.6%	67.0%



THE ROLE OF ORGANIZATIONAL RESOURCES AND MARKET COMPETITIVENESS IN INNOVATIVENESS

DOI:

Arzu KARAMAN AKGUL¹, Sıtkı GOZLU²

¹Yıldız Technical University,. E-mail: akaraman@yildiz.edu.tr

²Istanbul Technical University. E-mail: gozlus@itu.edu.tr

Keywords:

Organizational Resources,
Innovativeness,
Market Competitiveness

JEL Classification:

O30, O15, D24

ABSTRACT

The purpose of this study is to empirically test a framework based upon the relationships among organizational resources, market competitiveness, and innovativeness of organizations with special emphasis on enterprises in Turkey. Data used in the study were gathered from Business Environment and Enterprise Performance Survey conducted by World Bank. The research framework was tested using descriptive statistics and regression analysis. The results of logistic regression analysis indicate that both organizational resources and market competitiveness have a direct, positive and significant impact on product innovations. In contrast, neither operational resources nor market competitiveness variables have a significant and direct impact on process innovations but only human resources has. The limitation of this study is its narrow focus on Turkish enterprises. Thus including the other emerging countries might be useful in generalization of findings. By validating a multi-dimensional construct of innovativeness, the study provides managers with a useful tool for evaluating their current resources and competitiveness in the market. Second, the analysis of the relationship among organizational resources, market competitiveness and innovativeness indicates that human resources directly influence both product and process innovations. This paper adds to the body of knowledge by providing empirical insights into the relationships among organizational resources of companies, market competitiveness and innovativeness of companies operating in Turkey.

1. INTRODUCTION

Globalization is getting higher, markets and technology are changing rapidly, and complexities and uncertainties are increasing in the market, which results in the creation of a new competitive environment (Tracey et al. 1999).

In the industrial era, firms aimed to produce a narrow range of products, sustain economies of scale and achieve high productivity and low costs. In post-industrial era, organizations take the customer needs into the consideration and aim to develop production systems which design, produce and deliver high-value products to the customer (Anatan and Radhi, 2007). In today's highly competitive environment changing demands of customers for customized and high quality products force the firms for responding them quickly as much as possible (Tracey, et al., 1999). In other words firms have to meet the changing needs of their customers and cope with the pressures of their competitors as well. Every company aims to gain and sustain a competitive advantage and this aim could only be achieved by the capability of firms to introduce innovations (Rungtusanatham and Forza, 2005; Barrett and Sexton, 2006).

Innovativeness of the firms means adopting the innovations as quick as possible and it depends on their management practices, capabilities and resources. Other influential elements for adopting innovations are customers and competitors which are called as market competitiveness in this study. These influential elements, in other words innovation drivers are categorized in two main schools of thought (Barrett and Sexton, 2006). These theories are trying to explain the differences in the performance of firms in different ways. The first theory is referred as the market-based view of innovation and it focuses on the market. According to this perspective competitive advantage is gained due to the competition barriers of the market in which the company performs. Second theory is called as the resource-based view of innovation and it stresses the role of the firm's resources and capabilities in profitability and value of the firm. Resource-based view point to valuable, rare, inimitable and non-substitutable resources of the firm that could not be imitated easily by competitors and this theory explains competitive advantage by means of these resources. In other words resource-based view focuses inward of the firm, whereas market-based focuses outward (Barrett and Sexton, 2006; Makhija, 2003).

The purpose of this study is to determine the underlying dimensions of innovativeness and to empirically test a framework identifying the relationships among organizational resources of companies, market competitiveness and innovativeness of organizations operating in Turkey. This paper seeks to add to the body of knowledge by providing empirical insights into those relationships. The remainder of this paper is organized as follows. The next section presents the literature review that helps to underpin the research framework and sets out the study's hypotheses. The research methodology is presented in the third section. Results and discussion are in section four followed by conclusion and implications.

2. LITERATURE REVIEW

The framework developed in this study is shown in Figure 1. The framework proposes that both organizational resources used in organizations, and market competitiveness will influence the innovativeness of organizations directly. A detailed description of organizational resources, and market competitiveness along with innovativeness of organizations is provided in the following sections. Based on a literature survey, the proposed relationships among those are discussed and hypotheses related to these variables are developed.

2.1. Resource-Based View of Innovation

Resource-based view of innovation theory focuses on organizational capabilities which are defined as 'the comprehensive set of capabilities which are used by the organization in order to facilitate and support the innovation strategies'. Based upon the literature about innovation, it can be said especially in small manufacturing-based firms, accumulation and development of resources and capabilities are the relatively most important influential factors for innovativeness (Barrett and Sexton, 2006). In this study resources are classified as human resources and operational resources and the effect of each are investigated.

2.2. Market-Based View of Innovation

The second important factor for innovation is the ability of firms to understand and estimate the market. If a company wants to be innovative it has to consider the changing market conditions. The market-based view emphasizes the market conditions as those facilitate or hinder the innovativeness of firms (Barrett and Sexton, 2006). On one side we see that competition increases due to the number of competitors in the market and their pressure to reduce the costs, and to innovate while on the other side there is a pressure of customers' to reduce the costs and to innovate.

2.3. Innovativeness

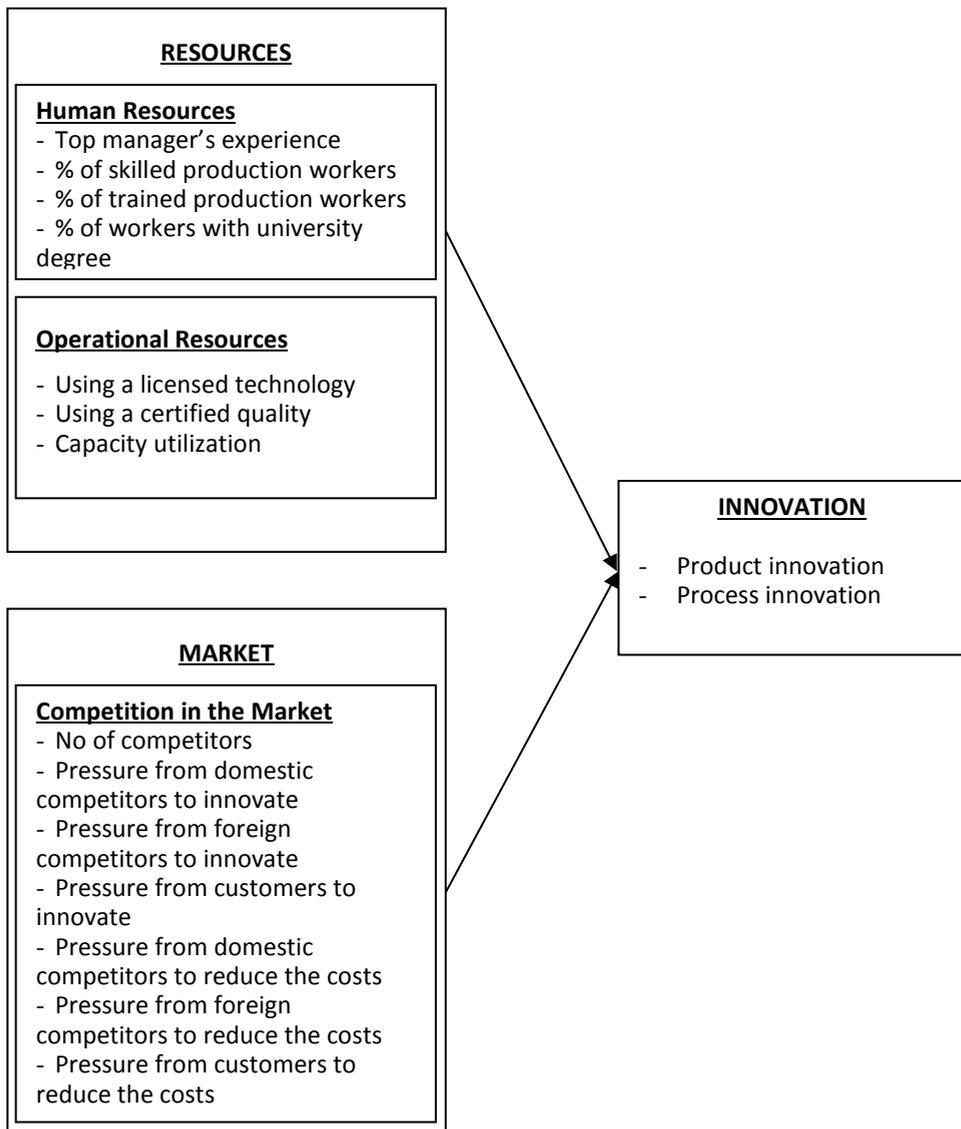
In today's highly competitive, dynamic and uncertain market environment with short product life cycles, product development becomes very important. It satisfies the quality and speed of production on one hand, and it must ensure that products are innovative on the other (Hsiao and Chou, 2004). Demands of customers are for customized and high quality products and manufacturing firms should response to these demands as quickly as possible (Tracey, et al., 1999). Each firm has to introduce new and perhaps radically innovative products for surviving in such a highly competitive, dynamic and uncertain environment (Rungtusanatham and Forza, 2005).

New product development process' aim to provide outstanding service to customers by manufacturing products with more variety and more suitable for customers' unique needs through responding without delay (Hsuan, 1999), since adjusting production methods globally and quickly in response to changes in the environment has become possible (Ethier, 2005).

Improving a new product is one of the most important management challenges today. Successful new products not only contribute to financial and market performance measures, but also offer new opportunities to become visible (Tseng, 2006). Schumpeter (1947) was the first economists who emphasized the importance of new products in economics. Since then, the studies related with the innovation area have defined different types of innovation which cover process innovations beside product innovations (Cooper, 1998; Walker, 2006; Friedrich et al., 2010). Thus, innovation can be defined as

the management of all the activities involved in the process of idea generation, technology development, manufacturing, and marketing of a new (or improved) product or manufacturing process or equipment (Trott, 2008).

Figure 1: Research Model



2.4. Hypotheses

The developed framework proposes that organizational resources have a direct impact on the innovativeness of companies. Innovativeness of a company is expected to increase when companies have a higher level of human and operational resources. This leads to the following hypotheses:

H₁. Companies having a higher level of human resources are likely to make product innovations.

H₂. Companies having a higher level of human resources are likely to make process innovations.

H₃. Companies having a higher level of operational resources are likely to make product innovations.

H₄. Companies having a higher level of operational resources are likely to make process innovations.

Other influential element is the market competitiveness. Pressures come from the customers and competitors to innovate and reduce the costs, and the number of competitors in the market is expected to enhance a company's innovativeness. Thus, following hypotheses are developed:

H₅. Companies performing in a competitive market are likely to make product innovations.

H₆. Companies performing in a competitive market are likely to make process innovations.

3. RESEARCH METHODOLOGY

The hypotheses are tested by utilizing the data in Business Environment and Enterprise Performance Survey conducted by World Bank. The survey provides a wide range of data regarding to financing, laboring, infrastructure, training, innovation, quality, technology etc. related issues in 29 economies located in the region of Europe and Central Asia. It is a periodic survey, which is last updated in 2009 (The World Bank, 2009). The data used in this study is collected from 1152 Turkish companies in 2008. 860 of these 1152 are operating in manufacturing industry, 165 in service industry and others in core industry. The main aim of our study is to investigate the effects in manufacturing companies, the data regarding to these 860 companies are used here. Since the survey is conducted in all regions of Turkey, the results can be generalized to Turkey.

All factors investigated in the conceptual model, variables used in measuring these factors and scales used for the items are provided in Appendix 1.

In some questionnaires there are some missing values due to lack of knowledge, declining to give any response or because of some other reasons. The most common approach to missing data is list-wise deletion which means omitting the cases with missing data and running the analyses on what remains. A total of 26 questionnaires were eliminated due to high percentage of missing values. List-wise deletion often results in a decrease in the sample size but since the sample size is big enough, the sample size is considered satisfactory for subsequent analysis.

4. RESULTS AND DISCUSSION

The frequency distribution of the sample firms is shown in Table 1. The sample consists of firms from a wide variety of industries. Most of the firms (15.7 %) are operating in textile industry. Firm age distribution shows that 83.88 % of the firms have been operating from zero to twenty nine years. The small-sized, medium-sized and large-sized firms are distributed equally in the sample.

After evaluating the firm specific characteristics included in the sample with frequency tests, the proposed relationships shown in Figure 1 was tested with logistic regression. Since our dependent variable is a yes/no question which means it is a dichotomous variable, logistic regression is an optimal method (Allison, 2012).

Appendix 2 and Appendix 3 show the results of logistic regression analysis. While the models in Appendix 2 are investigating the relationship between the independent variables and product innovation, the models in Appendix 3 are investigating the relationship between the independent variables and process innovation. Model 1 in Appendix 2 and Appendix 3 are the baseline models which include only the control variables. The results show that firm size and age are significant in the expected direction for product innovation. Interestingly, we could not find significant evidence that industry influences product innovation. Thus, in Model 2 industry is removed from the model and human resources variables (experience, % of skilled and trained production workers, and % of workers with university degree) are included. According to the results, skilled and trained production workers have a likelihood of making product innovations. In Model 3 we use skilled and trained production workers only and add operational resources (using a licensed technology, using a certified quality and capacity utilization). The results show that using a licensed technology is significant in the expected direction. In Model 4 we focus on market-based view and investigate the relationship between market competitiveness and product innovations. According to the results, the main important point considered by the companies is the number of competitors in the market. And Model 5 is a comprehensive model that takes all of the significant variables into the consideration. Based upon the results of Model 5, companies that have trained production workers, use a licensed technology and take the number of competitors into account have a higher likelihood of making product innovations. The results demonstrate that all hypotheses related with product innovations (H_1 , H_3 and H_5) are accepted.

Model 1 in Appendix 3 shows that all of the control variables are significant in the expected direction for process innovation. Thus, all these variables and human resources variables (experience, % of skilled and trained production workers, and % of workers with university degree) are included in Model 2. According to the results, firm age and trained production workers affect the likelihood of making product innovations. In Model 3 operational resources (using a licensed technology, using a certified quality and capacity utilization) are added to the model and the results show that using a licensed technology is significant in the expected direction. In Model 4, we focus on the market-based view and investigate the relationship between market competitiveness and product innovations. According to the results, the main important point considered by the companies is the number of competitors in the market. And Model 5 is a comprehensive model that takes all of the significant variables into consideration. Based upon the results of Model 5, firm age and having trained production workers affect the likelihood of making process innovations. Accordingly, firm age and the human resources are more important in making process innovations than the market competitiveness and their operational resources. Therefore we can say only H_2 is accepted for process innovations.

Table 1: Demographic Characteristics of the Sample

	Frequency	Percent
Industry		
Textiles	176	15.67
Food	157	13.98
Garments	126	11.22
Non-metallic mineral products	109	9.71
Chemicals	106	9.44
Retail	99	8.82
Wholesale	82	7.30
Plastics & rubber	43	3.83
Fabricated metal products	38	3.38
Machinery and equipment	34	3.03
Other services	34	3.03
Basic metals	19	1.69
Electronics	12	1.07
Construction	11	0.98
Transport	7	0.62
IT	2	0.18
Hotel & restaurants	1	0.09
Firm Age		
0-9 years	253	22.53
10-19 years	458	40.78
20-29 years	231	20.57
30-39 years	111	9.88
40-49 years	35	3.12
50 and more years	26	2.32
Don't know	8	0.71
Firm size		
Small Sized Enterprises	351	31.3
Medium Sized Enterprises	442	39.4
Large Sized Enterprises	330	29.4

5. DISCUSSION AND CONCLUSION

This paper has provided empirical justification for a framework that identifies two school of thoughts and describes the relationship among them and innovativeness of companies within the context of Turkish companies.

Data used in the study were gathered from Business Environment and Enterprise Performance Survey conducted by World Bank. The research framework was tested using descriptive statistics and regression analysis. The results of logistic regression analysis indicate that organizational resources and market competitiveness have a direct, positive and significant impact on product innovations made by the firms.

In contrast, neither operational resources nor market competitiveness have a significant and direct impact on process innovations but only human resources has.

This study offers a number of managerial implications. First, by validating a multi-dimensional construct of innovativeness and by exhibiting its value in today's highly competitive market, it provides managers with a useful tool for evaluating their current resources, their current position in the market and their innovativeness. Second, the analysis of the relationship between human resources, operational resources and innovativeness indicates that human resources might directly influence both the product innovations and process innovations. Third, the findings of this study tend to support the resource based view and market based view for innovation in an emerging country context.

Researchers can further extend the findings of this study for future studies, but it should also be acknowledged that our study is subject to some limitations. The limitation of this study is its narrow focus on Turkish companies. Future research should endeavour to collect data from other emerging countries in order to generalize the findings.

REFERENCES

- Allison, P. D. (2012), Logistic regression using SAS, SAS Institute Inc., US.
- Anatan, L, and Radhi, F (2007), "The Effect of Environmental Factors, Manufacturing Strategy and Technology on Operational Performance: Study amongst Indonesian Manufacturers", *Ekonomi & Bisnis*, Vol. 1 No. 3, pp. 119-133.
- Barrett, P. and Sexton. M. (2006), "Innovation in Small, Project-Based Construction Firms", *British Journal of Management*, Vol. 17, No. 4, pp. 331-346.
- Cooper, J. R. (1998), "A multidimensional approach to the adoption of innovation", *Management Decision*, Vol 36, No.8, pp. 493-502.
- Ethier, W. J. (2005), "Globalization, globalisation: trade, technology, and wages," *International Review of Economics and Finance*, Vol. 14, pp. 237–258.
- Friedrich, T. L., Mumford, M. D., Vessey, B., Beeler, C. K., & Eubanks, D. L. (2010), "Leading for Innovation", *International Studies of Management and Organization*, Vol. 40, No. 2, pp. 6-29.
- Hsuan, J. (1999), "Impacts of supplier-buyer relationships on modularization in new product development," *European Journal of Purchasing & Supply Management*, Vol. 5, pp. 197-209.

- Makhija, M. (2003), "Comparing the Resource-Based and Market-Based Views of the Firm: Empirical Evidence from Czech Privatization", *Strategic Management Journal*, Vol. 24, No. 5, pp. 433-451.
- Rungtusanatham, M. and Forza, C. (2005), Coordinating product design, process design, and supply chain design decisions part A: Topic Motivation, Performance Implications, and Article Review Process, *Journal of Operations Management*, 23, pp. 257-265.
- Schumpeter, J. A. (1947), "The creative response in economic history." *The Journal of Economic History*, Vol. 7, No. 2, pp.149-159.
- The World Bank. (2009), Business Environment and Enterprise Performance Survey. Business Environment and Enterprise Performance Survey. Retrieved July 1, 2013, from <http://data.worldbank.org/data-catalog/BEEPS>
- Tracey, M., Vonderembse, M. A. and Lim J. (1999), "Manufacturing technology and strategy formulation: keys to enhancing competitiveness and improving performance", *Journal of Operations Management*, Vol. 17, pp. 411–428.
- Trott, P. (2008), *Innovation management and new product development*. Prentice Hall.
- Tseng, Y. H. (2006), "Examining the relationship between the design-manufacturing cooperation and new product development time performance: the moderating role of technological innovativeness", *Journal of American Academy of Business*, Vol. 9, No. 1, pp. 133-138.
- Walker, R. M. (2006), "Innovation Type and Diffusion : an Emprical Analysis of Local Government", *Public Administration*, Vol. 84, No.2, pp. 311-336.

Appendix 1: Variables used in the study

Variable	Definition
Control Variables	
Type of Industry	Activity field of the establishment
Firm Size	Size of the establishment consists of three dummies corresponding to small, medium and large firms. Small firms have 1-19 employees, medium firms have 20-99 firms, while large firms have over 100 employees.
Firm Age	Age of the establishment is calculated by subtraction the year of the survey (2008)-the year in which the firm is established
Ownership	Ownership consists of three dummies corresponding to state, domestic and foreign.
Resource Based View	
Resource-Based View	
<i>Human Resources</i>	
Top manager's experience	Years of experience of the top manager in this sector. It consists of three dummies corresponding to low-level, mid-level and highly experienced. It takes the value 1 if the top manager has had below 3 years of experience, it takes the value 2 if the top manager has had between 3-10 years of experience, it takes the value 3 if the top manager has had more than 10 years of experience.
Skilled production workers	Percentage of permanent skilled production workers
Trained production workers	Percentage of permanent trained production workers
Workers with university degree	Percentage of workers that has university degree
<i>Operational Resources</i>	
Using a licensed technology	Use of technology licensed from a foreign-owned company, excluding office software
Using certified quality	Having an internationally-recognized quality certification
Capacity utilization	Capacity utilization consists of three dummies corresponding to the establishment's capacity utilization levels below 50%, between 50% and 80%, and above 80%.
Market Based View	
<i>Market Competitiveness</i>	
Number of competitors	Total number of competitors in the market
Pressure from domestic competitors to innovate	The importance of domestic competitors in affecting decisions to innovate
Pressure from foreign competitors to innovate	The importance of foreign competitors in affecting decisions to innovate
Pressure from customers to innovate	The importance of customers in affecting decisions to innovate
Pressure from domestic competitors to reduce the cost	The importance of domestic competitors in affecting decisions to reduce the costs
Pressure from foreign competitors to reduce the cost	The importance of foreign competitors in affecting decisions to reduce the costs
Pressure from customers to reduce the cost	The importance of customers in affecting decisions to reduce the costs
<i>Innovation</i>	
Product innovations	It is a yes (1) no (2) question "Has your company developed a new product line in the last three years?"
Process innovations	It is a yes (1) no (2) question "Has your company upgraded an existing product line in the last three years?"

Appendix 2: Logistic Regression Analysis Results for Product Innovation

Variable	Model 1				Model 2			
	B	S.E.	Wald	Exp (β)	B	S.E.	Wald	Exp (β)
Industry	0.001	0.004	0.019	1.001				
Firm size	0.139	0.078	3.123	1.149*	0.009	0.082	0.012	1.009
Firm age	-0.002	0.001	2.716	0.998*	-0.002	0.001	2.580	0.998
Experience					0.001	0.000	1.663	1.001
Skilled production workers					0.000	0.000	5.023**	1.000
Trained production workers					-0.001	0.000	43.538***	0.999
Workers with university degree					0.000	0.000	1.433	1.000
Using a licensed technology								
Using a certified quality								
Capacity utilization								
No. of competitors								
Pressure from domestic competitors to innovate								
Pressure from foreign competitors to innovate								
Pressure from customers to innovate								
Pressure from domestic competitors to reduce the costs								
Pressure from foreign competitors to reduce the costs								
Pressure from customers to reduce the costs								
Product innovations								
Process innovations								
R² (Nagelkerke)	0.008				0.063			
R² (Cox&Snell)	0.006				0.047			
-2 LL	1538.852				1491.844			
χ²	χ ² = 21.683, p=0.05, d.f.=8				χ ² = 7.802, p=Not sig., d.f.=8			

Appendix 2: Logistic Regression Analysis Results for Product Innovation (Cont'd)

Variable	Model 3				Model 4				Model 5			
	β	S.E.	Wald	Exp (β)	B	S.E.	Wald	Exp (β)	B	S.E.	Wald	Exp (β)
Industry												
Firm size												
Firm age												
Experience												
Skilled production workers	0.000	0.000	0.011	1.000								
Trained production workers	-0.001	0.000	45.493***	0.999					-0.001	0.000	49.424**	0.999
Workers with university degree												
Using a licensed technology	0.001	0.000	3.953*	1.001					0.001	0.000	15.328**	1.001
Using a certified quality	0.001	0.001	0.465	1.001								
Capacity utilization	0.000	0.000	2.307	1.000								
No. of competitors					0.000	0.000	4.057*	1.000	0.000	0.000	9.337**	1.000
Pressure from domestic competitors to innovate					0.003	0.011	0.092	1.003				
Pressure from foreign competitors to innovate					0.001	0.001	0.354	1.001				
Pressure from customers to innovate					-0.004	0.010	0.175	0.996				
Pressure from domestic competitors to reduce the costs					-0.011	0.021	0.264	0.989				
Pressure from foreign competitors to reduce the costs					0.000	0.001	0.123	1.000				
Pressure from customers to reduce the costs					0.011	0.021	0.262	1.011				
Product innovations												
Process innovations												
R² (Nagelkerke)	0.061				0.013				0.068			
R² (Cox&Snell)	0.045				0.009				0.051			
-2 LL	1493.782				1535.147				1487.166			
χ^2	$\chi^2= 4.713$, Not sig., d.f.=8				$\chi^2= 6.566$, p=Not sig., d.f.=8				$\chi^2= 6.844$, p=Not sig., d.f.=7			

Appendix 3: Logistic Regression Analysis Results for Process Innovation

Variable	Model 1				Model 2			
	B	S.E.	Wald	Exp (β)	B	S.E.	Wald	Exp (β)
Industry	-0.009	0.004	4.273**	0.991	-0.003	0.006	0.211	0.997
Firm size	0.161	0.080	4.060**	1.175	0.038	0.084	0.209	1.039
Firm age	-0.002	0.001	4.991**	0.998	-0.002	0.001	4.898**	0.998
Experience					0.000	0.000	0.701	1.000
Skilled production workers					0.000	0.000	0.015	1.000
Trained production workers					-0.001	0.000	38.983***	0.999
Workers with university degree					0.000	0.000	1.272	1.000
Using a licensed technology								
Using a certified quality								
Capacity utilization								
No. of competitors								
Pressure from domestic competitors to innovate								
Pressure from foreign competitors to innovate								
Pressure from customers to innovate								
Pressure from domestic competitors to reduce the costs								
Pressure from foreign competitors to reduce the costs								
Pressure from customers to reduce the costs								
Product innovations								
Process innovations								
R² (Nagelkerke)	0.021				0.073			
R² (Cox&Snell)	0.016				0.054			
-2 LL	1494.635				1449.610			
χ²	χ ² = 21.531, p=0.01, d.f.=8				χ ² = 17.333, p=0.05, d.f.=8			

Appendix 3: Logistic Regression Analysis Results for Process Innovation (Cont'd)

Variable	Model 3				Model 4				Model 5			
	β	S.E.	Wald	Exp (β)	B	S.E.	Wald	Exp (β)	B	S.E.	Wald	Exp (β)
Industry												
Firm size												
Firm age	-0.002	0.001	5.154**	0.998					-0.002	0.001	4.758**	0.998
Experience												
Skilled production workers												
Trained production workers	-0.001	0.000	40.4860***	0.999					-0.001	0.000	44.255**	0.999
Workers with university degree												
Using a licensed technology	0.001	0.000	6.884*	1.001					0.000	0.000	0.618	1.000
Using a certified quality	-0.001	0.001	2.197	0.999								
Capacity utilization	0.000	0.000	8.615	0.999								
No. of competitors					0.000	0.000	4.710*	1.000	0.000	0.000	1.220	1.000
Pressure from domestic competitors to innovate					0.001	0.006	0.000	1.001				
Pressure from foreign competitors to innovate					0.007	0.012	0.370	1.007				
Pressure from customers to innovate					-0.010	0.006	0.024	0.990				
Pressure from domestic competitors to reduce the costs					-0.006	0.007	0.773	0.937				
Pressure from foreign competitors to reduce the costs					-0.005	0.012	0.211	0.995				
Pressure from customers to reduce the costs					0.071	0.007	0.913	1.073				
Product innovations												
Process innovations												
R² (Nagelkerke)	0.083				0.027				0.072			
R² (Cox&Snell)	0.062				0.020				0.053			
-2 LL	1440.854				1489.211				1450.879			
χ²	χ ² = 8.137, Not sig., d.f.=8				χ ² = 9.670, p=Not sig., d.f.=8				χ ² = 12.291, p=Not sig., d.f.=8			